The unintended consequences of information system change on organizational memory:

Remembering and forgetting in English and Ontarian child protection services

Thesis submitted in partial fulfilment of the requirements for the degree of DPhil in Information, Communication and the Social Sciences in the Oxford Internet Institute at the University of Oxford

Thomas M. Vogl

Balliol College

Michaelmas Term 2023

96,811 Words



Abstract

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Thesis submitted in partial fulfilment of the requirements for the degree of DPhil in Information, Communication and the Social Sciences in the Oxford Internet Institute at the University of Oxford

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This thesis set out to enhance our understanding of the unintended consequences of information technology change on organizational memory in child protection services. It sought to resolve puzzles about how 'perfect' digital memory could be accompanied by forgetting and how organizational amnesia could be concurrent with bureaucratic inertia. Information technology change in this sector is ostensibly aimed at addressing key challenges exposed by child death reviews, performance audits, and research into child outcomes, such as the issue of past information not being available for front-line or policy decision making. However, the promise of digitization was not always achieved. A motivation for undertaking this research was thus to better understand divergences between what was intended and what was realized. Focused and theoretically informed qualitative field research that included observation, interview, and document analysis was carried out in child protection organizations that were implementing new information technologies (the Child Protection Information Network enterprise case management system in Ontario, and predictive analytics tools using machine learning in England). Findings called into question the completeness of existing theories of organizational memory. The interpretive approach to analysis suggested that there might be additional forms of memory (grounded in fundamental ontology) that could help to account for the unexplained phenomena encountered in the field research, resolve the puzzles, and offer a novel foundation for the study of memory phenomena in government. The final contribution is an extended typology of organizational memory that can provide memory-related rationale for unintended consequences of information system change in child protection. This theoretical extension of organizational memory has implications for how we understand identity change, accountability, technology adoption, and learning in public sector organizations. The findings suggest that if information technology is built without attending to the different forms of memory at play, then it may not achieve its desired objectives.

In memory of Hubert Dreyfus, Christopher Pollitt, and Bessie Tratch.

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[Thomas and Quinton Vogl, Cripley Meadow Allotment, plot SF6, Photo by Joanna Kolakowska, 10 October 2020 – Published in Cripley Meadow Allotment Association Newsletter January 2021]

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Chapter 1: Introduction

This thesis looks at the unintended consequences of information system change in child protection services through the lens of organizational memory. It explores this topic through the study of a new enterprise case management system, the Child Protection Information Network (CPIN), in Ontario and decision support tools, like predictive analytics, in English local authorities. It proposes that people do not always have the information from the past that they need when they need it, despite being surrounded by digital technologies, because those technologies embed the values of different worlds in a way that influences what gets remembered and how work is done. This diverges from the information processing perspective embedded in much of the study of organizational memory (Walsh and Ungson 1991; Stein and Zwass 1995; Corbett et al. 2020) and leads to an extended typology of organizational memory that goes beyond the ontological limitations of information processing. This helps to explain technology mediated identity change, the discrepancies in accountability regime legitimacy, the adoption of technology in complex organizational systems, and how organizational learning occurs in the process of public administration.

Digitization in the child protection sector is ostensibly aimed at addressing key oversight and accountability challenges exposed by child death reviews, performance audits, and research into child outcomes, such as the issue of past information not being available for front-line or policy decision making. The problem of a mismatch between the promise of digitization and data use (drawing insights from past events) and what occurs in practice (relevant information not being available when needed) is what shaped the topic, because of

the relationship between data, practice, and memory. The research aims to better understand the divergences between what was intended and what was realized. To this end, the thesis identifies some specific puzzles and offers an extended typology of organizational memory based on the research findings as a means to solve them.

This thesis is as much about forgetting as it is about memory and the extended typology of organizational memory is intended to help better understand not only the different ways in which organizations remember, but the interplay between different types of remembering and forgetting. Ultimately, the goal of this thesis is to show that organizational memory is not only what can be represented or understood from an information processing perspective, but also includes activities using tools and the identities that give those activities sense. This novel theorization has implications for accountability (what gets measured to account for performance and whose values are prioritized in those measures), technology adoption (how technological change can lead to the diffusion of different values among different groups), and organizational learning (how learning to use a new tool can lead to unanticipated changes in organizational activity).

The motivation for looking at issues in child protection through the lens of organizational memory is that there are unexamined links between them. In some cases of high-profile child death, information was forgotten, either because historical records were not available (OCC 2014), or a holistic picture was missing because information from different service sectors was compartmentalized and not seen together (Laming 2003). At the same time as this type of information was being forgotten, the conditions under which this forgetting occurred largely persisted (Laming 2009; OCC 2016). In other cases, data elements in risk assessments persisted while workers were deskilled, and their professional expertise was forgotten (Hall et al. 2010). Despite having different information systems in place, public administrations in Ontario and England were finding they did not have the accurate and reliable information they needed to monitor the service system effectively and

satisfy their accountability obligations (OAGO 2015a; Marcroft and King 2013). Work was being done, but the explicit memory of that work was sometimes forgotten, as records of that work were often incomplete (Vogl 2020c; Bright et al. 2019; Clayton et al. 2020). In terms of new technology for risk assessment, What Works for Children's Social Care in the UK found that despite the promise of predictive analytics in children's social care, there was insufficient data available to generate the sensitivity and specificity needed to justify its use in local authority settings (Clayton et al. 2020). Despite the introduction of novel digital technologies, staff in public administration do not always have the information from the past that they need for decision making.

What these problems share is a relationship to memory, but this relationship is not always explicitly mentioned. Public inquiries, for example, discuss historical records (OCC 2014), prior involvement with other service providers (Laming 2003), or persistently sticky practices (Laming 2009; OCC 2016). These are all instances where information, infrastructure, or experience from the past had some bearing on the present. Similar discussions about data, performance measurement, artificial intelligence, narratives, and practices are common in public administration, digital government, and child protection research, but memory is rarely mentioned. Maybe it is time we began to frame some of these problems in terms of organizational memory.

When put in terms of memory, a number of puzzles emerge from these examples. For instance, how can the problem of forgetting become worse with technology when digitized records are purported to give us a 'perfect memory' (Mayer-Schönberger 2009, 4)? Further, how can an organization have amnesia about service involvement and repeat the same problems, while at the same time experiencing profound inertia around established routines? Political scientist Christopher Pollitt identified these two puzzles as emerging from the information age: that digitization is paradoxically accompanied by loss of memory, and that the context of digitization includes a focus on the 'extended present' rather than the past

or the future, leading to the uncomfortable coexistence of organizational amnesia and bureaucratic inertia (Pollitt 2000). Pollitt says about the first puzzle that, "[i]t is one of the paradoxes of our age that, while new information technologies have provided us with the ability to store, retrieve, manipulate, and communicate more data, faster than ever before, at the same time many of our public institutions seem to be losing their memories." (Pollitt 2000, 5). As a result, “the potential of contemporary ICTs is not reflected in the actual practice of policy-making and management” (Pollitt 2009, 215). And this seems to have persisted as a problem in the public sector since Pollitt raised this concern (Starks 2018; Mulgan 2018; Sedley 2016). About the second puzzle, Pollitt says that "forms of cognitive and behavioural conservatism can certainly co-exist with a quite radical loss of touch with the past." (Pollitt 2000, 8). These two puzzles, of (1) digitization and forgetting and (2) forgetting and inertia, set the foundation for this project’s study of organizational memory.

This thesis charts the journey from these puzzles to a solution through an exploration of digital change in public child protection. Three questions, thus, motivate this research: one based on the overarching motivation and two based on the puzzles. First, what is behind the unintended consequences of information system change that sometimes prevent that change from achieving its stated aims? Second, why, despite rapid and continued digital transformation, does the public sector continue to experience organizational amnesia? Third, how is it possible to have organizational amnesia and bureaucratic inertia at the same time? The answers to these questions tie together the forms of memory in this extended typology with other organizational and public administration phenomena, such as identity and the associated ideas of accountability, technology adoption, and learning.

Making sense of these research questions depends on a theoretical understanding of what organizational memory is and a suitable methodological approach to identify its manifestations. The thesis identifies five forms of memory, three traditional and two novel. Research data from the child protection sectors in Ontario and England is used to elucidate

the limitations of prior interpretations of organizational memory, illustrate how the interpretations can be meaningfully broadened, and show how this broadened interpretation can resolve the two puzzles that guide this research. The three traditional forms are static explicit memory, in rules, roles, and records, dynamic explicit memory, in inter-agential communication, and tacit memory, in conceptual frameworks. These forms of memory describe organizational phenomena encountered in the research, but are limited by their focus on knowledge and information processing, as some organizational memory phenomena seem resistant to representation and are more related to embodied activity using tools and the being of particular kinds of actors. In response, to these findings, this thesis proposes two novel forms of memory in equipment, which are tools in use as opposed to tools as objects of reflection, and being-in-the-world, which is a self-interpretation within a world that orders activity. These novel forms extend the ways in which Identity and the associated concepts of accountability, technology adoption, and learning in government services can be interpreted, specifically how they become implicated in the unintended consequences of information systems change. While the novel forms emerged over the course of the research, their theoretical foundations are presented with the others in the literature review (chapter 2). Examples of each form of memory are presented in the substantive chapters (chapters 5 though 9).

To study these memory phenomena, an interpretive methodological approach was adopted. The particular interpretive approach was abductive using modified multi-sited comparative case studies of digital change in Ontarian and English child protection. The abductive approach began with existing theoretical understandings of organizational memory and adjusted the theoretical approach in response to evidence emerging from the research data during collection and processing. These reinterpretations were an application of a modified hermeneutic circle, which began with traditional understandings, but with an openness to radical revision of the underlying assumptions in response to observations in

the field. This led to a more sophisticated understanding of the organizational memory phenomena, which offered a means to solve the puzzles.

There were three key interpretive stages in the research and data analysis. The first adopted an understanding of organizational memory as the storage of different kinds of information (the repository model). This conceptualization saw memory as largely explicit and statically stored in rules (standard operating procedures), roles (structural artifacts), and records (information about the past) (Walsh and Ungson 1991), including in digital form (Stein and Zwass 1995). The second emerged in response to some research findings suggesting the importance of dynamic relationships between people and with technologies (Orlikowski and Scott 2008; Corbett et al. 2018). The third interpretive stage occurred after data collection during data processing and was responding to evidence that there were types of memory operating in the background that could not be adequately captured under the rubric of explicit memory (Polanyi 2015; Dreyfus 1991). In general, these interpretive moves are paralleled in the order of the substantive chapters on explicit, tacit, and implicit organizational memory. The table below illustrates the forms of memory and associated theoretical foundations that were focused on at a given interpretive stage. These theoretical foundations and interpretive stages are presented in greater detail in the literature review (chapter 2) and the research design and methodology (chapter 3).

Table 1: Forms of memory, theoretical foundations, and interpretive stages

Forms of Memory	Theoretical Foundations	Interpretive Stages
Static Memory	Repository metaphor	Research Design
Dynamic Memory	Critical Realism and Sociomateriality	Preliminary Findings
Tacit Memory	Tacit Knowing	Data Analysis
Implicit Memory (Equipment and Being)	Fundamental Ontology	Data Analysis

The sources used in this thesis include documents, interviews, and in-person observation with participants across inter- and intra-organizational boundaries in child protection services that were in the midst of technological change. The goal was to better understand the connection between information technology change and organizational memory in the field.

Some topics are out of scope for this research. It does not purport to explain the particular causal mechanisms at play, just to establish a conceptual framework within which they could be tested. It also does not suggest that this conceptualization of organizational memory would apply across different government service sectors or the private sector. There is evidence (not framed in terms of organizational memory) that it could (Orr 1995; Dunlop 2017; Riemer and Johnston 2017), but this would require further in-depth study. It also does not provide a complete picture of the pathologies of organizational memory, such as amnesia, it merely provides an extended typology by which further empirical study could better elaborate the different pathologies that could emerge from the unintended consequences of technological change. Finally, it does not purport to provide any insights into the connection between memory pathologies and the approach to public management,

though it provides a framework with which to evaluate these phenomena under bureaucratic and post-bureaucratic administrations.

There were some limitations relative to sources of data. Sources were limited to publicly available documents and documents voluntarily shared by participants, as freedom of information requests were expected to be too time consuming and costly for the research scope and budget, and without adding significant value to the theoretical contribution, given that key findings were expected to emerge from observing and discussing the technology in use. Such material could be useful in studies seeking to better understand causal mechanisms, the history of the project, and the world of public administrators. The comparative approach is asymmetrical because observational research was limited to child protection agencies in Ontario, as COVID-19 restrictions prevented the planned in-person research in English local authorities[1]. This limited the implicit understanding of organizational memory in predictive analytics projects in England. Observational research in the Ontario public service was also not possible, as there was a change in government[2] that led to a policy across government of no speaking with experts or stakeholders about policy[3]. Interviews (with retired staff) and off-the-record fieldwork (with government, local authorities, and central government) were able to make up enough of the gap to be confident in the theoretical contribution.

What this thesis does aim to do is reduce conceptual ambiguity around the concept of organizational memory in the context of information system change in the public sector. Scholars have tried to fit too many different organizational memory phenomena into the same bucket. The theoretical conflation of memory forms hampers research in this field. This

[1] I had moved my family (wife and infant son) to the UK to complete this research only six weeks prior to restrictions coming into effect.
[2] This occurred just over a month prior to the completion of my Transfer of Status and just over two weeks before the approval of my CUREC.
[3] This negated the two years of pilot work and preparation that I had been doing in the lead up to the official commencement of my research.

thesis aims to deliver a clearer typology of organizational memory phenomena. This conceptual reconfiguration and reimagining of organizational memory aims to illuminate the grounds for the unintended consequences of information system change, specifically around identity, accountability, technology adoption, and learning. The fundamental premise of this thesis is that different things are remembered or forgotten in different ways depending on organizational position and perspective, which involve implicit memory phenomena, and that this has implications for how technology influences the diverse memory processes in public administration settings. There is a disconnect between the promise and practice of information technology in public administration and this typology can enhance our comprehension of its source. Looking at information system change in English and Ontarian child protection services, this thesis will present a more sophisticated typology of organizational memory, illustrating each type with examples from the research and in so doing propose solutions to the two puzzles presented above. This thesis will show, in substantive chapters, how traditional understandings of organizational memory fail to explain some memory phenomena and the associated puzzles ((1) digitization and forgetting, (2) forgetting and inertia). It then argues that taking memory to be not something purely epistemological, but as something with a different ontological status that relates to doing and being, does solve these puzzles and offers a means to better understand the unintended consequences of information technology change.

The remainder of the thesis is structured in terms of the extended typology of organizational memory. The literature review (chapter 2) elaborates on traditional views of organizational memory summarized here (static, dynamic, and tacit) and sets out the conceptual foundations for the novel interpretation of organizational memory. The research design and methodology (chapter 3) expands upon the research design, execution, and analysis, as well as the sources used and challenges encountered. A short history of administrative and informatization changes in the child protection sector (chapter 4) provides

context for some of the phenomena and topics discussed by participants. The substantive chapters clarify the different types of organizational memory and are split across two parts. The first part touches on phenomena related to explicit forms of memory: static (chapter 5), dynamic (chapter 6), and the tacit foundation for the first two (chapter 7). The second part builds on the idea that there are forms of memory operating in the background and discusses two implicit forms of memory related to equipment (chapter 8) and being-in-the-world (chapter 9). The substantive chapters in the first part illustrate how existing perspectives on organizational memory are relevant but incomplete, and the second part introduces novel forms that extend theory and offer new means of understanding unintended consequences in information system change in child protection. The discussion (chapter 10) and conclusion (chapter 11) provide an analysis of how this distinction between types of organizational memory offers novel insights for broader organizational phenomena, such as identity, and helps resolve the two puzzles. This thesis charts the journey from these puzzles to the solution grounded in a new perspective on organizational memory with the help of examples from digital change in public child protection.

Chapter 2: Literature review – organizational memory in public administration and child protection

This chapter provides an overview of the literature needed to understand the typology of organizational memory that is developed over the course of this thesis. It describes the existing understandings and themes related to organizational memory in public administration, digital government, and child protection, highlights some limitations of the existing discussions, and provides the conceptual underpinnings for an extended understanding of organizational memory. This sets the foundation for the argument, trajectory, findings, and conclusions of this thesis, specifically, that an extended typology of organizational memory is needed to better understand the unintended consequences of information systems change.

This chapter is structured as follows: it first provides key details about the literature review process; second, shows how issues of memory are present, significant, yet unacknowledged in the mainstream literature on public administration and child protection; third, describes how these memory issues fit within the broad themes of identity, accountability, technology adoption, and learning; and fourth, presents the conceptual underpinnings needed to understand the relationship between the examples presented in the substantive chapters and the different forms of memory.

The exploration of the conceptual underpinnings begins with the three traditional perspectives on organizational memory, described here as static, dynamic, and tacit, with static and dynamic being prevalent in public administration, information systems, and

organizational studies, and tacit in knowledge management. It then describes how these perspectives share a common commitment to a Cartesian cognitivist, information processing, and knowledge-focused interpretation of organizational memory. It then introduces fundamental ontology as a way to shift the focus away from epistemological questions to ontological questions. This perspective focuses on different ways of being, rather than just the Cartesian subject-object knowledge-focused perspective on the world. The ways of being include the being of things either as (1) objects (the traditional Cartesian view); or (2) equipment, and (3) the being of humans (being-in-the-world). This perspective introduces two novel forms of memory related to equipment and being-in-the-world. Fundamental ontology illustrates how an interpretation that includes different ways of being can accommodate existing perspectives, enrich the discussion about organizational memory, and offer a means to engage with the problems guiding the thesis research.

2.1. Notes on the literature search

This section provides a summary of the literature review process. It presents the search approaches, database search and forward and reverse citation searches, to illustrate the limitations of academic enterprise search in this field, and the importance of citation networks and paper nodality in enhancing search outcomes.

A search of three databases on identical terms related to public administration, organizational memory, and digital government was conducted in June 2021 (updating a broader literature review completed in January 2017). The three databases searched were ProQuest's Social Science Premium Collection, Scopus, and the Web of Science Core Collection. Searches included all dates, which were 1914-present for ProQuest, 1788-present for Scopus, and 1900-present for Web of Science. Both peer-reviewed and non-peer-reviewed scholarship was searched, where that option was available. Two searches were conducted, one exploring all discussions of organizational memory in public

administration and the other looking at these two topics in the context of digital government[4]. The search involved only title, abstract, and keywords to identify documents whose main focus included these topics[5]. The findings from these searches are presented in table 2 below.

Table 2: Narrow search of title, abstract, and keywords on first public administration (PA) and organizational memory (OM), and then PA, OM, and digital government (DG)

Search Terms	ProQuest	Scopus	Web of Science
PA & OM	37	21	12
PA, OM, & DG	0	2	0

In table 2, there is a divergence between the databases in terms of the total number of documents returned. These differences suggest that there are inconsistencies between the databases[6]. In addition to highlighting the difficulties associated with database search for academic research in the social sciences, overall, these findings from the database searches revealed that research with a primary focus on organizational memory in public administration was limited, and the number of studies that focused specifically on public sector organizational memory in the digital age was quite small.

[4] The exact queries in Boolean form were: ("public administration" OR "public management" OR "public policy") AND ("organizational memory" OR "organisational memory" OR "institutional memory") for the first search; and ("public administration" OR "public management" OR "public policy") AND ("organizational memory" OR "organisational memory" OR "institutional memory") AND ("e-government" OR "digital government" OR "digital state" OR "digital era governance" OR "virtual state") for the second search.

[5] For ProQuest, this was accomplished by searching anywhere except the full text, for Scopus, this was done by searching title, abstract, and keywords, and for Web of Science, this was done by searching title, abstract, author keywords, and Keywords Plus. Results were current as of June 8th, 2021.

[6] ProQuest data was found, upon inspection, to contain a number of duplicate records. The search initially returned 55 documents, of which 18 were duplicates. These duplicates were manually removed to produce the figure (37) for table 2. Another note is that while Scopus identified 2 documents satisfying the PA, OM, and DG search, one of the two documents was a conference proceedings summary where three separate papers each matched one of the topics.

These disappointing database search results led to the exploration of alternative search strategies. What was more fruitful in terms of literature searching, after identifying a few key works on organizational memory in public administration, was conducting backward snowball citation reviews and forward citation searches using Google Scholar. This identified the network and lineage of thinking around organizational memory and identified some research that was inconsistently captured, or in some cases, not captured at all in the database searches. Similar searches were conducted in organizational and management studies, and more specifically in child protection, and included memory adjacent concepts highlighted by Pollitt in his research on organizational amnesia (2000). This approach also led to works where concepts like databases, narratives, or practice were discussed, but with no explicit mention of memory. Much of the research on digital government, information technology, and child protection fell in this category. In the next section, we will briefly look at the relevance of organizational memory in studies where it is presupposed, but rarely explicitly mentioned, before presenting the literature underlying the organizational memory typology at the centre of this thesis.

2.2. The presupposition of organizational memory in mainstream public administration and child protection scholarship

Organizational memory is a key, if unacknowledged, aspect of much public administration and child protection scholarship (Pollitt 2000; Stark and Head 2019; Corbett et al. 2020). Topics such as evidence-based policy and practice, and performance management depend on administrative data being used to inform present decision making. Research related to big data, data science, artificial intelligence, and machine learning have seen exponential growth. Despite these topics being related to the use of stored repositories of past data, little, if any, mention of memory is made. The purpose of this section is to elucidate the connection between organizational memory and mainstream research topics in public administration, digital government, and child protection.

In terms of mainstream preoccupations, the relevance of organizational memory can be inferred from topics such as accountability, performance measurement, technological isomorphism and adoption, and policy learning (Perry and Christensen 2015; Peters and Pierre 2013; Ferlie, Lynn, and Pollitt 2007; Fischer and Miller 2006; Goodin, Moran, and Rein 2008). Accountability, for example, assumes a prior decision and an understanding about who should be held accountable for that decision. When faced with policy fiascoes, "initial judgements [about events and policymakers] tend to guide the socially organized process of remembering and forgetting that we call history-making" (Bovens and ’t Hart 1996, 47). In the context of performance measurement, performance data is difficult to analyze because government is constantly changing its metrics, thus making it difficult to compare performance over time (C. Hood and Dixon 2015). In terms of technology adoption, information systems need to align with the natural flow of existing worker interactions (Foster and Stiffman 2009). In terms of policy learning, key processes of information acquisition, storage, distribution, and interpretation, which underlie any form of learning, depend on organizational memory (Dunlop and Radaelli 2012). Pollitt suggests that learning is not possible without being able to make use of possibly relevant past experience, or memory (Pollitt 2000), and it is well known in the organizational memory literature that “the basic processes that contribute to the occurrence, breadth, and depth of organizational learning depend on organizational memory” (Huber 1991, 107). It appears as if extending organizational memory theory in public administration could enhance mainstream public administration research.

In the more specific area of digital government, there are a number of key topics with an un- or under-acknowledged connection to organizational memory. Topics like big open linked data (Janssen and Kuk 2016) and open government (Clarke and Margetts 2014; Martin 2014) assume there are documents and datasets from the past that can be made publicly available. Social media and chatbots provide means to better understand the past

opinions, interests, and behaviours of citizens (Androutsopoulou et al. 2018; Clarke and Margetts 2014). Discussions of information sharing (Kim and Lee 2006; Gil-Garcia, Chengalur-Smith, and Duchessi 2007; Gil-Garcia and Sayogo 2016; Yang and Maxwell 2011), data quality (Allard et al. 2018; Kolkman 2020; van Noordt and Misuraca 2020; Vogl 2020c), and interoperability (DeNardis 2010; Eynon and Margetts 2007; Gottschalk 2009; Pardo, Nam, and Burke 2011; Landsbergen and Wolken 2001) assume past information is spread across multiple repositories and can be linked, retrieved, processed, and used to support decision-making. Technology acceptance (Foster and Stiffman 2009; Sun and Medaglia 2019; Verdegem and Verleye 2009), changes in organizational structure stemming from the introduction of digital technologies (Bovens and Zouridis 2002; Vogl et al. 2020; Lorenz, Meijer, and Schuppan 2021), and automation (Lindgren, Toll, and Melin 2021; Gustafsson and Wihlborg 2019) assume past ways of doing things and desired technologically enhanced destinations. Digital identity seeks to stabilize service recipients over time (Lips 2010; Vogl 2020c) and artificial intelligence takes data from the past to help inform the present (Barth and Arnold 1999; Criado, Valero, and Villodre 2020; Kolkman 2020; van Noordt and Misuraca 2020). All of these topics have some connection to static memory held in records, dynamic memory generated through intersubjective communication, tacit memory of the conceptual frameworks that make explicit memory possible, or practice- and identity-based memory that operate in the background. Reframing these topics in terms of organizational memory offers an opportunity to enhance conceptual clarity, which would be valuable given the importance of memory to the functioning of digital technologies, for example with training data as memory inputs into machine learning models, big data as a form of stored memory, or code as a form of artificial memory about how to do things.

It is worth emphasizing that while digital government has been a marginal topic in mainstream public administration research (Dunleavy et al. 2006; Pollitt 2011), over the course of the research, there has been an explosion of interest in artificial intelligence in

government (Agarwal 2018; Margetts and Dorobantu 2019; Medaglia, Gil-Garcia, and Pardo 2023). However, despite there being such an interest in something built on historical data and its relation with government, there is no emphasis on memory. Much of the focus is on critiques related to bias or assumptions operating behind technology in government (Eubanks 2017). Despite this, there are gestures towards the importance of memory (Vogl 2016). On the topic of data used for things like predictive analytics using machine learning, there are risks of historical bias: “The very choice to use historical data (and in some sense, all data are historical) may be viewed as a policy choice in that it expresses a wish or at least a willingness to replicate aspects of the past to achieve policy goals. For future possibilities and untried systems, we have no data.” (Levy, Chasalow, and Riley 2021, 315). The state, in its data use, makes a policy choice to selectively reproduce the past and this relationship to the past deserves greater scrutiny.

On a more specific level, child protection services have an intimate connection to multiple different types of memory, as these services occur in a distributed organizational system that is still coming to terms with the implications of digitization. Many different types of memory inform decision making at multiple levels of the service system but depend on underlying administrative data collected in the course of street-level services. Front-line child protection workers use narrative and contextual information about their clients to make case-level decisions. Agency executives use aggregate data to identify trends and make agency-level decisions. Political leaders and senior public servants use performance measures from across all agencies to make system-level decisions. Getting organizational memory from one place to another requires dynamic boundary spanning, translation, and a clear trajectory, which are important in an era inflected by decentralization, distributed service provision, audit culture, and networked governance. As noted in the introduction, information or expertise from the past that professionals and administrators in the child protection sector need for decision making are not always available or accessible.

Many of the debates in child protection about the consequences of information technology change, while not cast in terms of memory, parallel those about competing database and narrative logics (Parton 2006; Dormer 2011; Vogl 2020a). In particular, the child protection sector is concerned about how data can inform practice (Fallon et al. 2017), but also how information technology can embed particular ways of remembering children and families, for example by means of atomization in a database over unification through a narrative (White, Hall, and Peckover 2009; Hall et al. 2010; Parton 2006).

Some scholars working in the field of child protection on the influence of information technology, explicitly investigate the sometimes conflicting interpretive stances of different groups and what this means for the status of technologies-in-practice, suggesting that the development of technology should be informed by its use in practice, rather than merely by what is technically possible (Gillingham 2012), though these interpretive conflicts may have less to do with technological specifications, than with the interests of those procuring, developing, or implementing the systems (White et al. 2010). In some ways, these debates match those about organizational memory, raising questions about how and why we remember things, whether it is through static records, files, or data, dynamic narratives and storytelling between organizational actors, or indeed some other form of memory entirely.

2.3. Key themes in organizational memory in child protection

The areas where memory is presupposed, but not explicitly mentioned tend to overlap with four key themes: identity, accountability, technology adoption, and learning. This section describes the interconnections between these themes and memory. Memory is closely associated with identity, insofar as memory helps form the core of identity (Rowlinson et al. 2009; Anteby and Molnár 2012). Identity is at the foundation of organizational activity and interactions and depends on all forms of memory. Accountability is related to performance and depends on static explicit memory about the past in the form of performance measures and standards for compliance. The research revealed that there may

also be an implicit form of memory that influences the purposes behind what gets measured and what standards are put in place. Adoption is related to complexity in organizations where a technology, policy, or the meaning therein may embed memories from members of a specific group or level of the organizational space. The research revealed that forms of memory can be different at different organizational layers and technology adoption can bring these different memories into conflict and competition, where some can be privileged over others. Learning is related to the acquisition of information that can be stored in memory and brought forth from memory. The target of our attention is directed by previous learning retained in memory. Memory also influences how learning is distributed in organizational settings, and learned conceptual frameworks that influence information interpretation are stored in memory. Types of learning can also include experiential learning of expertise (Schön 2016) or public service craft (Stark and Head 2019).

Unpacking identity is crucial to understanding its relation to memory and the themes of accountability, technology adoption, and learning. Identity is typically defined at something that is central, distinctive, and continuous for individuals and groups (Gioia et al. 2013). The central core of identity is composed of memory (Anteby and Molnár 2012; Rowlinson et al. 2009). However, forgetting is not always seen as negative, but as crucial for identity maintenance (Anteby and Molnár 2012) and adaptation (March 1972). The interplay of remembering and forgetting combined with a typology that includes different forms of memory can also help to resolve the seeming paradox of identity appearing to endure despite ongoing change (Gioia et al. 2013), similar to the puzzle of forgetting and inertia. Understanding the processes of remembering and forgetting that underlie memory are important because, according to Gioia et al., “[o]rganizational identity provides a guide for what an organization’s members should do and how other organizations should relate to it” (2013, 161). In this way, identity shapes what different individuals, groups, and organizations feel responsible for, influences whether a technology fits with what people do, and shapes

what internal and external pressures influence learning. However, organizations are not monolithic and “[s]ome and possibly most organizations can be viewed as arenas wherein members of various subworlds or social worlds stake differential claims, seek differential ends, engage in contests, and make or break alliances in order to do the things they wish to do” (Strauss 1978, 125). When thinking about accountability, technology adoption, and learning, considering the different identities that might be at play and the memories that they prioritize are crucial to unpacking these phenomena.

Accountability, and specifically what to hold people accountable for and how to hold them accountable for those things, is intimately tied to memory. Shifting paradigms in public administration have been characterized by changes in accountability regimes. Studies of the public sector have identified a trend from the 1980s towards greater managerialism. Referred to as the New Public Management, changes prioritized performance metrics, efficiency, and outsourcing (Hood 1991). Performance measurement was seen as a key mechanism to ensure managerial control of policy and public services financing and delivery (Nichols et al. 2023). This has led to extensions of compliance with standards, audit, and inspection (Hood et al. 2016). A shifting focus from New Public Management to governance, specifically Digital Era Governance, emphasizes the role of information technology in enabling novel organizational forms characterized by an intelligent centre and devolved service delivery (Dunleavy and Margetts 2023). But accountability is about more than what is measured and explicit. There is a more fundamental question about whose purposes are embedded in what is measured, mirroring broader debates in organizational studies (Lounsbury and Ventresca 2003), with emphasis on either performance (Jain 2017) or social construction and practice in fields (Ackerman and Halverson 2004; Feldman and Feldman 2006). A novel typology of organizational memory can help focus attention not only on the measures adopted, but on whose values they privilege (and how those values can be understood as a different form of memory than the measures themselves).

The diffusion of technology and its adoption in different settings also have important connections to organizational memory. In terms of technology adoption, just as values have diffused from the private sector into the public sector, including child protection, through the New Public Management (Hood et al. 2016), and more recently through a fascination with agile approaches to digital service delivery (Mergel, Ganapati, and Whitford 2021; Clarke 2020), where digital government units "aim to diffuse their alternative model of operations and general philosophy of digital government" (Clarke 2020, 364), it has been suggested that different values can receive 'oxygen' from the latest waves of technological innovation (Lindquist 2022). In a complex system with competing values, those responsible for the delivery of digital transformations can influence what is explicitly and implicitly remembered by other organizational actors. Digital technologies can be the media for the diffusion of memory from one level of the organizational landscape to another. In this sense, one group can exercise instrumentarian power over another, subtly shifting what is considered 'correct' behaviour (Zuboff 2019). A novel typology of organizational memory can account for the ways in which different groups respond to the complex interconnected networks of memory. It can also account for how forms of memory interact with different organizational layers and ways that memory is mediated, especially under conditions of technology adoption (and the accompanying diffusion of meanings embedded in those technologies).

Finally, learning has been variously understood as information processing leading to a change in the range of potential behaviours (Huber 1991), the encoding of history in routines (Levitt and March 1988), or the epistemic updating of beliefs (Dunlop 2017), though some have also suggested learning can transform identity in addition to preferences (Checkel 2001). Regardless of the type of learning, memory is seen as critical to understanding the process of learning (Huber 1991). An extended typology of organizational memory can help to make sense of how workers learn a new information system, the values it embeds, the types of activities it affords, and the changes in identity it stimulates. This can

also help to clarify how learning is not always an improvement (it need not be conscious or intentional, improve effectiveness, lead to veridical knowledge, or result in observable change in behaviour) (Huber 1991).

In the context of complex public sector services systems, like child protection, developing an extended typology of organizational memory can take the forms of memory, organizational layers, ways in which memory is mediated (person, organization), and clarify the connection. It can also illuminate how unintended consequences related to identity, accountability, adoption, and learning can be a function of the instantiations of the forms of memory being different in different organizational spaces.

2.4. Conceptual underpinnings of an extended understanding of organizational memory

This section describes the forms of memory and the conceptual and historical underpinnings needed to make sense of the concrete examples presented in the substantive chapters of this thesis and their relationships to the key themes. It begins with the three traditional perspectives (static, dynamic, and tacit) and then discusses the second two novel forms of memory (related to equipment and being-in-the-world). The three traditional understandings of organizational memory have characteristics that create distinct limitations when trying to describe certain seemingly contradictory organizational memory phenomena. The two novel forms based on fundamental ontology require a fundamental shift in perspective about how we understand memory in organizations, but offer a means to resolve the thesis puzzles and better understand the key themes.

2.4.1. Traditional understandings of organizational memory

This subsection presents the three main traditional understandings of organizational memory. It provides a definition and some key characteristics of each and then their distinct limitations. It concludes with a limitation common to them all, that an extended understanding of organizational memory based on fundamental ontology aims to address.

Static explicit memory

The static perspective focuses on documents and files, including records and institutional components (like standard operating procedures or planning documents), in public sector organizations. Its material instantiations are in rules, roles, and records (Stein and Zwass 1995; Walsh and Ungson 1991) and it depends on a belief in memory as reproduction, where memory is an uncomplicated and unchanging copy of a past phenomenon, with historical metaphors of inscription, computation, information processing, and storage in a repository (K. Danziger 2008; Draaisma 2000). In this way, this form of memory is static and explicit.

In the public administration literature, this form of memory represents the information and knowledge within the organization, as well as the processes by which this information is acquired, stored and retrieved (Stark and Head 2019). Static, or formal institutional, memory has been defined as, “static repositories of summative documents holding a singular ‘objective’ memory” (Corbett et al. 2020, 2). Some scholars have associated the type of memory with the type of administration, suggesting that bureaucracies have better recording practices than post-bureaucratic organizations (Pollitt 2009; Wettenhall 2011). This form of memory is prone to a particular type of forgetting: “When seen through this lens, amnesia can be understood in terms of the decay or abandonment of ‘hard’ organizational mechanisms that have captured the lessons of the past” (Stark and Head 2019, 1523–24). So organizational changes that lead to worsened record-keeping could lead to pathological forgetting. This has implications for authority, because as Weber states, “[b]ureaucratic administration means fundamentally domination through knowledge” (1968, 225). When describing this knowledge, one type is official information, “which is only available through administrative channels and which provides [the bureaucrat] with the facts on which he can base his actions.” (Weber 1968, 1418). Static memory is seen as necessary for bureaucratic

control. Administrative reforms that negatively impact ‘official information’ are seen as a threat to static explicit memory.

Information systems scholars share a similar perspective on static explicit memory that includes mechanisms for retention, the processes of collection and retrieval, and an overarching information processing perspective (Stein and Zwass 1995; Walsh and Ungson 1991; Jennex and Olfman 2004; Croasdell et al. 2003). The information processing perspective of organizational memory is pervasive. Simon, for example, states that “[m]emories, as components of information-processing systems, need to be viewed as stores of *potential* information, which, if indexed effectively, can become available at a reasonable cost whenever it is needed as input to a decision-making process” (Simon 1997, 244). Simon’s information processing perspective on organizational memory, holds that once we understand “the decision-making system and its data requirements” (1973, 271), it will be possible to determine what needs to be "indexed for rapid retrieval" (1973, 273), suggesting that decisions and actions are solely based on explicit information. These perspectives are clearly focused on information, with the belief that there is a relationship between information and action.

In child protection, static explicit memory can be inferred from discussions of standards, service compartments, risk assessments, administrative data, case notes, and performance indicators (Peckover, White, and Hall 2008; Broadhurst et al. 2010; Parton 2009; Nichols et al. 2023; White et al. 2010). But these discussions often point to issues such as those with the Integrated Children’s System in the UK, where the back-end database compartmentalized front-end case-related data entry, and this “requirement to input data into a number of disparate electronic windows, fragments essential information and ensures that a complete picture is very difficult to obtain” (White et al. 2010, 412). In this way, it splits “the story into bits of information without an integrating structure” (Hall et al. 2010, 406). A focus on static memory was seen to interfere with remembering ‘a complete

picture’. In addition, "knowledge which cannot be squeezed into the required format disappears or gets lost." (Parton 2006, 262). Static explicit elements are rarely the sole focus of discussion, instead being embroiled with concerns about deskilling, deprioritization of case narratives, the emphasis on compliance over service outcomes, and the limits of data and predictive tools to support practice (Lemay 2011; Munro 2005; Clayton et al. 2020).

The limitation of the static perspective is that it depends on a centralized perspective of government wherein knowledge on a given topic can be made explicit for archiving in a document that contains a singular or objective memory (Corbett et al. 2018). However, this perspective is not seen to address the distributed and boundary-spanning nature of contemporary governance (Corbett et al. 2020), which is facilitated by information technology (Dunleavy and Margetts 2023). Further, despite information technologies being seen as offering the potential to “store, retrieve, manipulate, and communicate more data, faster than ever before” (Pollitt 2000, 5), static explicit memory is subject to several threats, including the churn of performance indicators and accounting categories, which limits comparability over time, and the forgetfulness of networks, where information can be misplaced, not shared, or not even recorded in the first place (Pollitt 2009). Finally, history can be at risk of being intentionally forgotten (Stark and Head 2019), as it can act as a ward against the novelty claims of management rhetoric (Pollitt 2000; Wettenhall 2011). Pollitt states that history is "a good antidote to naive acceptance of novelty claims, and history, in this sense is potentially subversive" (2000, 13). This suggests that recorded historical interpretations can be perspectival and a venue for conflict between groups.

These examples illustrating factors that impact static explicit memory suggest that focusing on rationalization by means of information technology risks missing crucial memory phenomena beyond the explicit (Margetts 2010). For example, the development of organizational memory in records and operational data, in the late 19th and early 20th centuries, was used to advance systematic management, the objectives of which were to

standardize routines, monitor and compare factory performance, and enhance the efficiency of manufacturing production (Yates 1990). As technology was able to transform more activity into data, the process of deskilling has expanded from the mechanical to the informational aspects of work (Zuboff 1988). The examples of narratives, expertise, objectives, and perspectives suggest that there are other forms of memory.

Dynamic explicit memory

The second, dynamic, perspective on organizational memory focuses on the social aspects of memory. Rather than memory being simply a static encoding of the past, it also involves a dynamic and continuous intersubjective retelling of events through live conversations (Stark and Head 2019; Corbett et al. 2020). This perspective focuses on how knowledge is distributed across organizations and how static memory can be reinterpreted through storytelling interactions between actors that translate those memories into a type of living memory (Corbett et al. 2018). Its socio-technical instantiation is intersubjective communication (Walsh and Ungson 1991; Feldman and Feldman 2006; Rowlinson et al. 2009) and it depends on a belief in memory as reconstruction, where, in the act of remembering, memory would be brought into alignment with the current context and this process would be social, involving the help of others, with historical metaphors of oral dialogue and midwifery (Plato 1956; K. Danziger 2008; Plato 2014). This memory is dynamic insofar as it involves the re-interpretation of past phenomena and explicit insofar as it involves communication between agents.

Mainstream public administration literature hints at dynamic memory when discussing how technology can support the interpretation or reinterpretation of static memory. While bureaucratic organizations may have better recording practices that lead to a more robust repository of static memory, they have been criticized for not being able to dynamically retrieve that information when it is needed or to learn from their mistakes (Pollitt 2009; Crozier 1964; Simon 1997). Some have suggested that digitization, reintegration, and

processing of decompressed data can overcome issues with traditional bureaucracy and the New Public Management and open up new opportunities for government to dynamically manipulate and use its data stores (Dunleavy et al. 2006a; 2006b; Margetts and Dunleavy 2013; Dunleavy and Margetts 2015; 2023).

Outside of public administration, existing research in information systems clearly discusses a narrative and social perspective on organizational memory in the context of information technology, though perhaps in slightly different terms than that in public administration (Bannon and Kuutti 1996; Tuomi 1999; Ackerman and Halverson 2004). This idea of memory aligns with actor network theory (Callon 1984; Latour 2005) and sociomateriality (Orlikowski 2007; Suchman 2007) insofar as technologies are involved in the social process of remembering, suggesting that the process could be inter-agential in addition to intersubjective. The distinction between static and dynamic memory also occurs along similar lines across areas of study, including child protection, though not always framed in terms of memory (instead as cases and databases or narrative and biography) (Parton 2006; Heimer 2001; R. Scott et al. 2019).

The limitation of the dynamic perspective is that there can be divergent narratives and interpretations, whether client, state, or professional, around overarching objectives and how work ought to be done (Cecchini and Harrits 2022). Narratives preferred by professionals, for example, can conflict with state or citizen narratives. A practical instantiation is that social workers “often ignore the structures of the ICT and insert the narrative.” (Hall et al. 2010, 406), because social work was built on the narrative construction of the subject (Parton 2006), and social workers felt that more meaningful accounts were carried “in their heads” (White et al. 2010, 411–12). This is in opposition to the screen and system level (Bovens and Zouridis 2002; Landsbergen 2004) and client-facing (Nichols et al. 2023) perspectives, which may privilege their own distinct dynamic memories. Competing narratives and underlying objectives that lead to frustration and disruption suggest that in

addition to explicit forms of memory, whether static or dynamic, there might be additional forms operating in the background[7]. Even Weber suggested that knowledge involves more than just explicit memory, it also includes “technical know-how in the widest sense of the word, acquired through specialized training” (Weber 1968, 1417–18).

Tacit memory

The third, tacit, perspective on organizational memory focuses on the conceptual frameworks operating behind dynamic remembering and the interpretation of static memory. It creates a link between knowledge and memory, as "individual knowledge is stored in memory" (Meyer and Sugiyama 2007, 20). Tacit memory is a type of memory that we cannot articulate, but that is the basis for explicit forms of memory. Unlike explicit memory, tacit memory is not knowledge held statically in a repository or dynamically communicated between actors, but represents structures that shape cognition, how we think, and what we can be said to know. It is embedded in individual cognition (personal knowledge) and is seen in the field of knowledge management as the organizational parallel of a non-declarative memory system in neural science and cognitive psychology (Squire, Knowlton, and Musen 1993; Nonaka 1994; Meyer and Sugiyama 2007; Kandel et al. 2013). It has some parallels in the ‘ordinarily invisible’ standards and classification systems imbricated in our lives (Bowker and Star 2000, 2) and the hidden influence of institutions that systematically direct our ways of thinking (Douglas 1986). But here, tacit memory is primarily grounded in the aligned concept of tacit knowledge.

The following paragraphs explore the idea of tacit knowledge, its relationship to conceptual frameworks, tool use, and skillful action, how it informed discussions in knowledge management related to automation and informatization, and its limitations when extended beyond conceptual frameworks to tool use and skillful action. This will clarify the

[7] This idea of things operating in the background is an important concept for understanding the tacit and implicit chapters and will be further elaborated in the passages that follow.

understanding of tacit memory adopted in this thesis and describe why background memory phenomena of the tacit and implicit are treated separately compared to the tacit knowledge phenomena that Polanyi clumps together (Polanyi 2015).

Michael Polanyi proposed the idea of tacit knowledge as knowledge that we all possess, but that manifests as a subsidiary awareness that we cannot fully articulate (Polanyi 2015). In this way, “our knowledge may include far more than we can tell” (Polanyi 1969, 133). Polanyi suggests that “knowing is exercised within an accidentally given framework that is largely unspecifiable” (Polanyi 1969, 134). The reason why tacit knowledge cannot be articulated is that “we cannot attend focally to elements that are used subsidiarily for the purpose of shaping the present focus of our attention.” (Polanyi 2015, 182). For Polanyi, the key point is that tacit knowledge is not separate from focal knowledge; instead, “all knowledge is either tacit or rooted in tacit knowledge.” (Polanyi 1969, 144). Polanyi believes that tacit knowledge is exemplified by conceptual frameworks, embodied tool use, and practical skillful performance.

In terms of conceptual frameworks, Polanyi believes that a mind has, “the capacity continually to enrich and enliven its own conceptual framework by assimilating new experience” (Polanyi 2015, 103). This suggests that conceptual frameworks are constantly changing as we use them in practice. This occurs as we use the ‘powers of inarticulate judgment’ to deal with the indeterminacy of representation (Polanyi 2015, 86). However, Polanyi does not restrict his discussion of tacit knowledge to representation, he also extends it to tool use and practical performances. He does draw a distinction between these phenomena: “[t]he conceptual framework of applicable knowledge is different from that of pure knowledge.” (Polanyi 2015, 175). Applicable knowledge is related to successful action or a proper performance, while pure knowledge is related to truth claims. While clumping these phenomena together, Polanyi draws a further distinction saying, “[k]nowledge can be

true or false, while action can only be successful or unsuccessful, right or wrong." (Polanyi 2015, 174).

In terms of tool use, Polanyi emphasizes its embodied, results-oriented nature. With tools, we focus on the achievement of operational results. In the case of a blind person's stick, for example, at some point we stop feeling the stick and instead begin to feel the objects at the end of it, making navigation possible. At this point, "[w]hen the new interpretation of the shocks in our fingers is achieved in terms of the objects touched by the stick, we may be said to carry out unconsciously the process of interpreting the shocks. … we become unconscious of the actions by which we achieve this result" (Polanyi 2015, 61). For Polanyi, this means that "[o]ur subsidiary awareness of tools and probes can be regarded now as the act of making them form a part of our own body." (Polanyi 2015, 59). Despite this embodied element, Polanyi believes that tool use is rule based, stating that "[t]echnology teaches only actions to be undertaken for material advantages by the use of implements according to (more or less) specifiable rules" (Polanyi 2015, 176). Tool use has a tacit element that is objective-oriented, contextual, and embodied, but also subject to rules and a conceptual framework.

In terms of skillful action, Polanyi emphasizes how practical learning is done by emulation, how skilled performance is goal-oriented, and how practical knowledge is undefinable and, in some cases, logically unspecifiable. Polanyi believes that people unconsciously learn practical skills by imitating an expert: "By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself." (Polanyi 2015, 53). Polanyi states that, "[w]hen exercising a skill we literally dwell in the innumerable muscular acts which contribute to its purpose, a purpose which constitutes their joint meaning." (Polanyi 1969, 160). Polanyi again stresses the unspecifiability of knowing, saying that "[a]lthough the expert diagnostician, taxonomist and cotton-classer can indicate

their clues and formulate their maxims, they know many more things than they can tell, knowing them only in practice, as instrumental particulars, and not explicitly, as objects." (Polanyi 2015, 88). According to Polanyi, there is a tacit dimension to both tool use and skillful action, and while hinting that there is a distinction between knowledge and action, he holds that the tacit dimension is in some way rule-based and related to conceptual frameworks and instrumental particulars.

The field of knowledge management became interested in tacit knowledge in the 1990s, as a means to conceptualize the translation of expertise into information systems. However, there was a misunderstanding: "many KM projects have stated as their aim the conversion of tacit to explicit knowledge, and storing and sharing it by developing proper ICT-systems for the purpose" (Virtanen 2013, 119), culminating in questions such as "how can we sack Mavis … and keep her brain?" (Randall et al. 1996, 26). However, these beliefs mistakenly assume that tacit knowledge can be converted to explicit knowledge. Some have blamed limited success of these types of IT projects on this misunderstanding of tacit knowledge (Grant and Qureshi 2006). Others aimed to correct it (Tsoukas 2005; Virtanen 2010). The corrected understanding suggested that "[o]nly explicit knowledge is the province of information technology" (Markus 2001, 58). While tacit knowledge could not be translated into explicit knowledge and stored in an information system, some authors suggested that we could represent some elements of tacit knowledge through refocusing and interpretation that occurs in moments of breakdown (Tsoukas 2005; 2011; Crane and Bontis 2014).

In public administration, there were similar discussions in different terms around habits of thought and the relationship between technology and tacit memory. When Pollitt states that "forms of cognitive and behavioural conservatism can certainly co-exist with a quite radical loss of touch with the past." (2000, 8), what he implies is that at the same time as certain habits of thought and action persist, public administrators can lose touch with some historical past. While not explicitly mentioned, Pollitt seems to be assuming that in

addition to recorded administrative history, there is another form of memory in cognitive and behavioural habits, which in some respects reflect the conceptual frameworks, tool use, and know-how that Polanyi describes. More recently, in the context of discussions about artificial intelligence, there have been ideas about artificing, where human judgement is used in combination with algorithmic tools (Snow 2021), and about the potential of decompressed data processing made possible by data science and artificial intelligence (Dunleavy and Margetts 2023). Through 'dialogical interaction' (Tsoukas 2011, 473), technology could be able to identify fragments of tacit memory captured in decompressed data that people could then meaningfully interpret.

The limitation of this tacit perspective is that it centres on cognition and its related concepts of information processing, subject-object dualism, and representation. Tacit memory assumes a world where all activity is based on rules and the processing of information, where there is a distinction between the knower and the known, the subject and the object, and where methodological individualism prevails. A focus on the individual does not capture all relevant memory phenomena in organizational settings and may even miss the collective underpinnings of our conceptual frameworks.

2.4.2. Limitations of traditional perspectives on organizational memory

It is necessary to extend our understanding of organizational memory beyond tacit because, despite Polanyi's attempt to capture knowing, doing, and being phenomena within the purview of tacit knowledge, in doing so he fails to acknowledge the ontological differences between the phenomena and classes them all under knowledge. This is a view grounded in a longstanding tradition about knowledge that hinders our ability to understand memory phenomena in doing and being. It emphasizes beliefs and representation over activity and perspective. When activity and identity are cast as know-how and rule-based, solutions tend to favour scientific management, automation, and expert systems (Taylor 1911; Hurley and Wallace 1986; Zuboff 1988), or more contemporaneously social physics,

machine learning, and artificial intelligence (Pentland 2014; Dwivedi et al. 2019). There are informational solutions to perceived information processing problems; however, what if some memory phenomena are not informational? A misunderstanding of the essence of the phenomena may be at the heart of the unintended consequences experienced when trying to solve problems and transform organizations with information technology.

This misunderstanding is related to the Cartesian (Platonic) worldview. This perspective separates thought and being, mind and body, ideas and the external world and is characterized by a methodological individualism that centres the thinking subject, the acquisition of knowledge through detached, disinterested inquiry, and memory as an essentially cognitive phenomenon (Dreyfus 1991; Coulter 1997; K. Danziger 2008). It is at the foundation of current information processing perspectives. With this perspective, "[t]he question is whether we are going to accept the view of man as an information processing device, or whether we are still enough in touch with our pre-Platonic essence to realize the limits of the computer metaphor" (Dreyfus, Dreyfus, and Athanasiou 1986, 205).

Discussions about static, dynamic, and tacit memory focus on the computer metaphor, which privileges cognitive and knowledge-focused phenomena, but this represents an incomplete picture of memory in organizations. The key limitation of this perspective on memory is that practical activity differs from information processing in that it suggests we engage with the world rather than a representation of it and that there is memory embedded in this world and the equipment within it. Engaging with memory held in practice requires a shift from thinking about organizational activity and digital technologies as strictly related to information processing, towards an understanding of organizational activity as a place of situated and meaningful use of equipment in practice in pursuit of self-interpretations. Information is experience that has already been processed by a meaningful framework. We need to shift our focus to the underlying experience. Space for such an understanding is made possible under a perspective that focuses on fundamental ontology.

2.4.3. Fundamental ontology and organizational memory

This section proposes fundamental ontology as the way to overcome the limitations of the informational focus of the traditional perspectives on organizational memory. Fundamental ontology is a "pre-ontological understanding of Being … from which alone all other ontologies can take their rise" (Heidegger 1962, 33–34). This suggests that there can be multiple ways of being, where the informational mode is just one. A focus on ontology can switch the focus from what we can know to how we do things and what we are. In this way, it suggests that memory should not just be seen in terms of knowledge, but in terms of doing and being. Dreyfus gives a summary of this perspective:

> *Since Descartes, philosophers have been stuck with the epistemological problem of explaining how the ideas in our mind can be true of the external world. Heidegger shows that this subject/object epistemology presupposes a background of everyday practices into which we are socialized but that we do not represent in our minds. Since he calls this more fundamental way of making sense of things our understanding of being, he claims that he is doing ontology, that is, asking about the nature of this understanding of being that we do not know – that is not a representation in the mind corresponding to the world – but that we simply are.*
>
> *Thus Heidegger breaks with Husserl and the Cartesian tradition by substituting for epistemological questions concerning the relation of the knower and the known ontological questions concerning what sort of beings we are and how our being is bound up with the intelligibility of the world. (Dreyfus 1991, 3)*

Whether explicitly or implicitly, organizational memory, and its analogues, take a cognitivist perspective. They assume that organizational memory is a cognitive process characterized by its connection to thoughtful reflection and a predicate logic, wherein properties adhere in substances (e.g., *this child* (substance) is *at risk* (property)). Databases do this explicitly, by, for example, atomizing people or things into cases with features. While narratives do not necessarily have this structure, they are nevertheless representations of the world. Finally, tacit memory plays a role in unconsciously structuring thought. In this way, knowledge is a technology that 'enframes' the world (Heidegger 1977). But this leaves us with puzzling phenomena. Dreyfus suggests that "[t]o free ourselves from the traditional

problems we must switch from epistemology to existential ontology" (Dreyfus 1991, 248). Through knowledge we create reality, but in practice we understand the world.

There are debates about different forms of knowledge needed by different actors (Parton 2006; Vogl 2020a), and there have been some scholars who have gestured towards a more ontological understanding, such as Scott with his notion of mētis (1998), but there is never a specific discussion about what kind of memory is embedded in what people do, how they do it, and why they do it. A perspective grounded in fundamental ontology fills this gap by directing focus to the procedural, or muscle, memory present in the world that is embedded in the background equipment and socialization that make collective pursuits intelligible. This thesis presents an interpretation of organizational memory that suggests not only that organizations draw on memory to help inform their decision-making, but that memory also forms the basis for what they do and what they are.

Summary of the implicit perspective grounded in fundamental ontology

Fundamental ontology helps to overcome the issue of placing too much focus on data, stories, or conceptual frameworks by recasting the traditional reflective stance as but one way of being in the world, and emphasizing that the reflective way of being is not even primary. Under fundamental ontology, the three ways of being in the world are present-at-hand, ready-to-hand, and being-in-the-world (Heidegger 1962).

The present-at-hand aligns with the traditional perspectives on memory as something cognitive that involves reflection and that can be static, dynamic, or tacit. This state is representative of the Cartesian subject-object dualism that underlies most approaches to the generation of knowledge (Dreyfus 1991). It is when we observe and reflect on the world, for example, when doing science. Fundamental ontology suggests that this is not the only way in which people and things are in the world.

There is also the ready-to-hand, which is the being of tools in use. It involves equipment with which people take actions in the context of other equipment in order to

accomplish particular objectives. Equipment should be understood as tools in use, as opposed to tools as objects of reflection. This means that when in use equipment disappears from reflective scrutiny and becomes embedded in that pursuit (for example turning a door handle to open the door, so that you can go somewhere, where the focus is on where you are going and not the door).

The third way of being is referred to as Dasein, literally ‘being there’, or being-in-the-world, which is the being of people, and which, in this case, involves a recognition of being and a self-interpretation of what it means to be. In other words, people act in the world based on an understanding of their being and a self-interpretation of what it means to be their kind of being, which could include a profession, an occupation, a status within a group, or some other socially intelligible interpretation. People are understood fundamentally not as a combination of mind and body undertaking intentional activities, but as entities that pursue particular identities through their everyday activities. This recognizes people’s dependence upon shared social practices (Dreyfus 1991). The first three forms of memory (static, dynamic, and tacit) are present-at-hand, the two novel forms of memory are equipment and being-in-the-world. Tacit and implicit memory do share the characteristic of largely operating in the background; however, tacit is distinct because it is the foundation for the comprehensibility of explicit memory, while equipment is related to doing and being-in-the-world is related to being.

Implicit memory in equipment

This section draws from Heidegger’s idea of equipment to highlight an implicit form of memory. In so doing, it proposes a fundamental shift in understanding and interpretation away from the idea of memory as representational knowledge, which pervades atomistic discussions of information technology and the data it stores and processes, and instead towards a situated, human, collective and contextual understanding of memory in equipment as more ontological and related to action, not merely thought, representation, information,

and mind. This section defines some terminology and describes some key features of this form of memory to set the groundwork needed to better understand the analysis of the child protection examples in the substantive chapter on this form of memory.

The first feature is that tools in use, referred to here as equipment, have a different ontological status than tools as objects of reflection. Equipment is ready-to-hand, and a tool as an object of reflection is present-at-hand. These represent two different ways of being. Information systems scholars have also thought about this distinction, suggesting that "[b]oth possible ways that IT can 'be' in practice—object of reflection or equipment in fluent use—will need to be acknowledged by IS researchers who wish to investigate authentically how people encounter IT in their local worlds." (Riemer and Johnston 2017, 1077).

The second feature is that equipment is transparent or invisible, in the sense that "[w]hen we are using equipment, it has a tendency to 'disappear.' We are not aware of it as having any characteristics at all" (Dreyfus 1991, 64). Heidegger says that,

> *[t]he peculiarity of what is proximally ready-to-hand is that, in its readiness-to-hand, it must, as it were, withdraw in order to be ready-to-hand quite authentically. That with which our everyday dealings proximally dwell is not the tools themselves. On the contrary, that with which we concern ourselves primarily is the work – that which is to be produced at the time (Heidegger 1962, 99)*

In other words, the tools, or equipment, we use are subsidiary to the focus of our activity. Dreyfus provides an example:

> *We hand the blind man a cane and ask him to tell us what properties it has. After hefting and feeling it, he tells us that it is light, smooth, about three feet long, and so on; it is occurrent [present-at-hand] for him. But when the man starts to manipulate the cane, he loses his awareness of the cane itself; he is aware only of the curb (or whatever object the cane touches); or, if all is going well, he is not even aware of that, but of his freedom to walk, or perhaps only what he is talking about with a friend. Precisely when it is most genuinely appropriated equipment becomes transparent. (Dreyfus 1991, 65)*

Equipment can lose this transparency and become a present-at-hand tool when it breaks down or becomes the object of reflective analysis. However, there can also be disruptions that do not quite reach the threshold of reflection and where a workaround can be easily found. In these cases, "a way of being of equipment is revealed which is more determinate

than transparent functioning and yet whose way of being is not that of an isolated, determinate, occurrent [present-at-hand] thing with occurrent properties" (Dreyfus 1991, 77).

The third feature is that as part of a task environment, pieces of equipment cannot be understood in isolation. Equipment must be understood as a whole. As Dreyfus explains, "[a]n 'item' of equipment is what it is only insofar as it refers to other equipment and so fits in a certain way into an 'equipmental whole'" (Dreyfus 1991, 62). From Heidegger's perspective, "[i]n the 'in-order-to' as a structure there lies an *assignment* or *reference* of something to something" (Heidegger 1962, 97). The interaction of pieces of equipment always underlies meaningful action. For example, a compliance report in child protection only makes sense in the context of explicit standards, an information system where activity can be measured, overarching administrative values of performance, and an assumption that compliance with standards has some correlation with public values of child safety or family support.

This points to the fourth feature to consider when trying to understand activity using equipment, the purpose of its use. As Dreyfus puts it,

> *besides the "in-order-to" that assigns equipment to an equipmental whole, already discussed, the use of equipment exhibits a "where-in" (or practical context), a "with-which" (or item of equipment), a "towards-which" (or goal), and a "for-the-sake-of-which" (or final point). To take a specific example: I write on the blackboard in a classroom, with a piece of chalk, in order to draw a chart, as a step towards explaining Heidegger, for the sake of my being a good teacher.* (Dreyfus 1991, 92)

A piece of equipment is defined in terms of what it is used for. Unlike the present-at-hand,

> *[t]he specific thisness of a piece of equipment, its individuation … is not determined primarily by space and time in the sense that it appears in a determinate space-and-time position. Instead, what determines a piece of equipment as an individual is its equipmental character and equipmental nexus* (Heidegger 1982, 292)

So, the specific sense in which equipment is used here means that it is not its physical properties, but how it fits into something we are trying to do. According to Dreyfus, "*for the user*, equipment is a solicitation to act, not an entity with a function feature" (Dreyfus 2007,

252). As Heidegger says, “[e]quipment is essentially ‘something-in-order-to’” (Heidegger 1962, 97).

Finally, using equipment is something that people can do in accordance with the ways that that equipment is normally used to accomplish those things. In this sense, equipment is public: it “displays *generality* and obeys *norms*” (Dreyfus 1991, 151). It is general insofar as anyone can use it, and it obeys norms insofar as there is an appropriate, proper, or correct way to do so (Dreyfus 1991). Infrastructure scholars found similar features, stating that a piece of infrastructure is learned as part of membership, links with conventions of practice, and embodies standards (Star and Ruhleder 1996).

The form of implicit memory in equipment, thus, has the following characteristics: (1) it is distinct from the Cartesian worldview; (2) is invisible (to reflection, but amenable to interpretation); (3) depends on a nexus of interrelated equipment; (4) is related to the purpose of tool use; and (5) anticipates a particular kind of user with a specific capacity or aptitude and understanding of appropriate use. This suggests that the memory in equipment is a collective understanding of which tools to use in what way towards some purpose that operates in the background and is revealed in organizational activity. A social worker, for example, may have a notepad, a smart phone, and a computer with case and record management software. In the course of their everyday work, they do not think of those things as objects, but instead use them towards understanding the situation and needs of their clients, recording their interaction, and meeting administrative requirements.

Implicit memory in being-in-the-world

This section draws on Heidegger’s idea of Dasein, or being-in-the-world, to highlight another implicit form of memory related to people not as knowers, but as involved actors with self-interpretations that order their activity within their worlds. Before proceeding, there are some key terms that need to be clarified: for-the-sake-of-which (purpose), Dasein, and involvement whole. Purpose, or for-the-sake-of-which, which was mentioned in the

equipment section, is the motivating drive for why we do things. It is not a goal, but a self-interpretation that orders activity (e.g., being a good teacher). Dasein, which is synonymous with being-in-the-world, is a being who has already been socialized into a for-the-sake-of-which in a world. The involvement whole includes the equipmental whole, which is all the equipment needed in a world, the referential whole, which is all the inter-relationships between that equipment, and a purpose or for-the-sake-of-which. In what follows, we will look at five features of implicit memory in being-in-the-world.

First, different worlds exist in organizational settings and these are at the foundation of being. In Heidegger's phenomenology, world has a number of features. First, Heidegger "distinguishes the human *world* from the physical universe." (Dreyfus 2007, 259). He suggests that the everyday world is prior to theory and is "self-sufficient and self-intelligible" (Dreyfus 1991, 122), breaking from the mind-body and cognitive focus of the Cartesian worldview. In addition to the world we all live in, he suggests that there are subworlds (Dreyfus 1991). Examples of subworlds can include, "the business world, the world of academia, but also one's family or society generally. Correspondingly, our identity can be multiple as "I" can be a manager, professor, mother, or modern citizen, depending on my particular involvement in these worlds." (Riemer and Johnston 2017, 1065). In the case of child protection, this would suggest that different worlds exist between organizations, departments, service compartments, generations of workers, as well as with the ministry, and these inform worker identities. These worlds can also intersect:

> *We can inhabit multiple such worlds on the basis of the various for-the-sakes-of-which of our nested identities, and we can encounter entities in those worlds practically as equipment or reflectively as objects, but what we encounter them as (their being) is always an interpretation on the background of our lived familiarity with—our being-in—such worlds. (Riemer and Johnston 2017, 1067)*

Different worlds can influence the meaning of equipment through the in-orders-to (end to which one's activity is directed) that apply in those worlds. As a result, the same piece of information technology can be "different equipment in different contexts" (Riemer and

Johnston 2017, 1074). A case management information system may be a place to record clients history for a social worker, but it may be a source of performance data for a government administrator. The memory embedded in worlds is what makes meaningful and purposive activity using equipment possible. In this sense, worlds are related to memory insofar as they are the foundation for identity.

Second, worlds are collective in that they are shared. As Dreyfus says, “it belongs to the very idea of a world that it be shared, so *the* world is always prior to *my* world” (Dreyfus 1991, 90). World implies a collective understanding that precedes any individual being. As Heidegger elaborates, “Dasein is with equal originality being-with others and being-amidst intrawordly beings. The world, within which these latter beings are encountered, is … always already world which one shares with the others” (Heidegger 1982, 297). What this means is that, "we always grow up into an already shared world and become who we are by assuming certain shared for-the-sake-of-which, both in a general sense (e.g., as modern Western citizens) and in very particular ways (e.g., as members of certain professions)" (Riemer and Johnston 2017, 1065). Individual human beings are not primary; instead, “[t]he shared familiar world, then, is what makes individual human beings possible" (Dreyfus 1991, 98). This collective feature of world suggests that it embeds a type of memory that is foundational to the formation of being in a collective of individuals and that this memory is intimately connected to the formation of beings in those worlds. For example, a social worker may be socialized into their profession through education, their specific occupational focus, such as child protection, by their sector, and even the world of their agency, by their coworkers.

Third, the first two features imply that memory behind being-in-the-world is largely invisible and prior to our interpretations. The world is invisible in the sense that we do not typically notice it. Dreyfus says, “[o]ur understanding of the world is preontological. We dwell in the equipment, practices, and concerns in some domain without noticing them or trying to spell them out” (Dreyfus 1991, 90). Here, Dreyfus is echoing Heidegger, who says, “[t]he

world as already unveiled in advance is such that we do not in fact specifically occupy ourselves with it, or apprehend it, but instead it is so self-evident, so much a matter of course, that we are completely oblivious of it" (Heidegger 1982, 165). The reason why world is invisible is because it precedes being, insofar as being does not exist until it is socialized within a world. Heidegger says, "Dasein, in so far as it is, has always submitted itself already to a 'world' which it encounters, and this submission belongs essentially to its Being" (Heidegger 1962, 120–21). This means, according to Dreyfus, that "[h]uman organisms do not have Dasein in them until they are socialized" (Dreyfus 1991, 95). For example, social workers are socialized into their identity before they inhabit the world of child protection, where they are further socialized into further subworlds. In each case, they do not take on the identity until they are socialized. Finally, rather than what we can know, "[t]he world is what we directly understand and in terms of which one can see how nature, equipment, persons, etc. fit together and make sense", and in this way world comes before and "it can account for the possibility and place of theory" (Dreyfus 1991, 122). In summary,

> *Heidegger's basic point is that the background familiarity that underlies all coping and all intentional states is not a plurality of subjective belief systems including mutual beliefs about each others' beliefs, but rather an agreement in ways of acting and judging into which human beings, by the time they have Dasein in them, are "always already" socialized. Such agreement is not conscious thematic agreement but is prior to and presupposed by the intentionalistic sort of agreement arrived at between subjects. (Dreyfus 1991, 144)*

Being-in-the-world is related to comportment or a particular way of ordering activity within a world that is socialized prior to any kind of conscious and reflective intersubjective agreement. It is not noticed, but makes any given way of being intelligible and meaningful.

Fourth, at the centre of socialization into a world, and thus being, is a purpose or for-the-sake-of-which. Purpose within a world is not a goal, or a role, or necessarily intentionally taken and should not be mistaken with conventional understandings:

> *Heidegger uses the term "the for-the-sake-of-which" to call attention to the way human activity makes long-term sense, thus avoiding any intimation of a final goal. A for-the-sake-of-which, like being a father or being a professor, is not to be thought of as a goal I have in mind and can achieve. Indeed, it*

> *is not a goal at all, but rather a self-interpretation that informs and orders all my activities.* (Dreyfus 1991, 95)

Going about everyday activities is purposive, but it need not be seen in terms of a goal. As Riemer and Johnston suggest, “[t]his for-the-sake-of-which is not simply a goal or future state but an existential identity that is ultimately possible only against established, shared, and public ways of living and understanding." (2017, 1064). Neither should a for-the-sake-of-which be understood as a role, for a role implies a present-at-hand interpretation (Dreyfus 1991), The idea of role "cannot capture what one simply knows how to do and be when one is socialized into some of the for-the-sake-of-whichs available in one’s culture" (Dreyfus 1991, 95). In addition, many organizing self-interpretations are not intentionally taken. As Heidegger says, it can be “seized upon either explicitly or tacitly” (Heidegger 1962, 119). Which is to say, “I pick up my most basic life-organizing self-interpretations by socialization, not by choosing them” (Dreyfus 1991, 96). In summary, “Dasein’s way of being (existence) is just the self-interpreting aspect of human being” (Dreyfus 1991, 24). The for-the-sake-of-which is an implicit memory about how to be and it comes from the world.

Disruptions to the for-the-sake-of-which can lead to anxiety, where “anxiety reveals Dasein as *dependent upon a public system of* significances that it did not produce” (Dreyfus 1991, 177). A new information system that disrupts pre-existing practices and purposes could create anxiety among workers. What anxiety does “is precisely to bring Dasein face to face with its world as world, and thus bring it face to face with itself as Being-in-the-world (Heidegger 1962, 233). As breakdowns bring equipment to attention, anxiety brings being to attention.

Fifth, being informs doing and thus brings together being-in-the-world, for-the-sake-of-whichs, and equipment. Being-in-the-world involves more than just a sense of purposiveness. Heidegger states: “Being-in-the-world … amounts to a non-thematic circumspective absorption in references or assignments constitutive for the readiness-to-hand of a totality of equipment” (Heidegger 1962, 107). Being-in-the-world combines

equipment with purpose. For example, “any given piece of equipment, e.g., a hammer, is what it is in a referential whole which connects it with other equipment, and any use of equipment, e.g., hammering, takes place in an involvement whole that connects it with many ways of being human” (Dreyfus 1991, 98). Equipment is always related to organized activities undertaken by human beings.

There is also a connection to identity. Riemer and Johnston state, "[e]quipment always has a bearing on enacting a particular identity. The ultimate for-which of the chain of referential assignments is termed the for-the-sake-of-which, the bearing that equipment has on a particular human enterprise (e.g., for-the-sake-of being a carpenter)” (2017, 1064). Every identity has its equipment. In this context, organized activities are

> *an integrated set of practices: one might say “a practice,” as in the practice of medicine. And each practice is connected with a lot of equipment for practicing it. Dasein inhabits or dwells in these practices and their appropriate equipment; in fact Dasein takes a stand on its being by being a more or less integrated subpattern of social practices.* (Dreyfus 1991, 96)

But equipment and practices are deeply inter-related and, as Riemer and Johnston say, ontologically inseparable (2017). In Dreyfus’ terms, “the very functioning of equipment is dependent upon social norms. Indeed, norms define the in-order-tos that define the being of equipment, and also the for-the-sake-of-whichs that give equipment its significance” (Dreyfus 1991, 154). So, the world is “the organized equipment and practices in which Dasein is involved, indeed, in terms of which Dasein defines itself” (Dreyfus 1991, 248), and “forms the background on the basis of which all activity and thought makes sense” (Dreyfus 1991, 249). If equipment plays a role in how beings define themselves, this suggests that “[n]ew technological and social developments are constantly changing specific ways for Dasein to be” (Dreyfus 1991, 161). Technology can influence a world in a way that leads to changes in identities. Some self-interpretations can be remembered at the expense of others that are displaced and forgotten. New implicit memories can be injected by one subworld into another through technology. In the substantive chapters, we will see how technological

change subtly shifts child protection work from front-line service towards office-based administration, record keeping, and compliance.

The form of implicit memory associated with being-in-the-world, thus, has the following characteristics: (1) it depends on the underlying worlds (world and subworlds); (2) it is shared; (3) it is invisible; (4) it depends on a purpose; and (5) it is related to activity in the world using equipment.

2.4.4. Summary of the conceptual underpinnings

In summary, the understanding of organizational memory that includes explicit, tacit, and implicit phenomena holds that there are three ways of being, present-at-hand, ready-to-hand, and being-in-the-world, but that under these, there are five forms of memory, shown in table 3, below. Three of these phenomena have to do with the present-at-hand, including two interpretations of explicit organizational memory (in static file repositories and dynamic intersubjective, or inter-agential, communication) and a tacit interpretation related to the conceptual frameworks underlying reflective thought and cognition. The two novel implicit forms of memory are ready-to-hand equipment and being-in-the-world. To this end, this study looks at these five forms of memory in the context of these three ways of being to overcome the problems associated with looking at phenomena from only a present-at-hand perspective.

Table 3: Forms of organizational memory by ways of being

Ways of Being	Forms of Memory
Traditional Perspective on Organizational Memory	
Present-at-hand	**Explicit - Static**
	Explicit - Dynamic
	Tacit
Novel Perspectives on Organizational Memory	
Ready-to-hand	**Implicit – Equipment**
Dasein	**Implicit – Being-in-the-world**

Each substantive chapter looks at examples from the research data in child protection through these lenses to illustrate their relevance and, in the case of the traditional forms, their limitations relative to the key themes, thesis problem, and puzzles.

An approach grounded in fundamental ontology is about enabling an interpretation of certain phenomena that are not immediately obvious (Wrathall 2011). To a certain extent, the target of such inquiry is phenomena that are hidden in plain sight. Equipment and being, like tacit memory, are things that are taken for granted to the point of becoming invisible; however, rather than influencing thought, they influence action and identity. This is important from the perspective of memory because the invisibility of the phenomena that make certain practices and ways of being intelligible may be an embedded aspect of the past that informs present decisions or actions, but not in a conscious, cognitively explicable way, but merely as an unspoken activity that is nevertheless intelligible in practice.

> *"To do its job of letting things show up as interpretable, the referential whole must remain in the background. Here Heidegger actually uses the term:*
>
> *The available [ready-to-hand] is always understood in terms of an involvement whole. This whole need not be grasped explicitly by a thematic*

> *interpretation. Even if it has undergone such an interpretation, it recedes into an understanding which does not stand out from the background. And this is the very mode in which it is the essential foundation for everyday circumspective interpretation. (191) [150]“* *(Dreyfus 1991, 198)*

2.5. Concluding statement

This chapter has presented the theoretical underpinnings for an extended understanding of organizational memory, specifically focusing on the five forms of memory. There are three traditional perspectives on organizational memory: static, dynamic, and tacit. Static focuses on files, records, and data held in repositories. Dynamic focuses on intersubjective communication, conversations, storytelling, and the narrative construction of memory in public sector organizations. Tacit memory focuses on the way we think about things. While not always explicitly mentioned, these ideas are assumed in many areas of debate in the study of public administration and child protection. These static, dynamic, and tacit perspectives have tended to try and describe organizational memory phenomena as purely knowledge-based cognitive processes; however, this traditional perspective leaves gaps relative to practical action and identity or self-interpretation. Missing from these debates is a recognition that memory also extends to how things are done and to what informs the doing. This lacuna leads to confusion that appears to generate puzzles, like inertia and forgetting or ‘perfect’ digital memory and forgetting.

Fundamental ontology offers a philosophical perspective that enables a broader understanding of organizational memory, looking at it not only as what can be known, but as what is done and what people can be. By looking at the different ways of being within organizations, elements of the existing literature can be preserved and extended, while clarifying those elements where a cognitivist lens has been applied to non-cognitive phenomena. Information technology may have an impact on what static memory is retained, what dynamic stories are recounted, and how phenomena are thought about, but without also looking at how a digital tool fits into an existing equipmental whole and the background socialization that makes meaningful action intelligible, the study of organizational memory in

public administration will always be incomplete. Looking at examples in the substantive chapters, we will see why this extended understanding of organizational memory is relevant to unraveling the thesis puzzles and furthering our understanding and approach to information technology in government.

Chapter 3: Research design and methodology

This chapter describes the unfolding of the research from design to analysis, including the data gathered, the analytical moves, and key considerations. This research began in an exploratory way with a broad research question and two guiding puzzles. The motivation for this research was to better understand why, despite digital change, governments experienced difficulties bringing information from the past to bear on present decisions. Ultimately, it explored how a revised typology of organizational memory could improve understanding of the unintended consequences of information system change in child protection.

This chapter is structured as follows. The next section is divided into three sub-sections looking at details about each key phase of the research trajectory. The first subsection focuses on design and the static memory assumptions behind it. The second describes the unfolding of the research and adjustments in response to dynamic and tacit memory phenomena. The third presents the final analytical perspective, grounded in implicit memory that was adopted to enable deeper interpretation of the research data. The section following the description of these three phases presents technical details about the data that was collected and how it was analyzed. Subsequent to that, there is a section on ethics and researcher positionality, then a note on the impact of COVID-19, before a concluding summary.

3.1. Overview of the way the research progressed

Over the course of the research, the assumptions and approaches changed in response to empirical findings, eventually leading to a perspective grounded in fundamental ontology that reconciled divergent results and offered a novel perspective on the phenomena at hand. Initial assumptions were based on a static interpretation of memory, focusing on memory as a repository of rules, roles, and records in documents, information systems, and databases. This decision was motivated by a desire to understand why relevant information was not always available for decision making. This was framed in terms of the puzzle about memory loss despite digital change. It was also informed by existing literature and theory about current public administration paradigms (i.e., New Public Management, Neo-Weberian State, or more traditional administration, and New Public Governance, instantiated in this case by ideas about Digital Era Governance).

The initial assumptions used for research design were inadequate for dealing with the complexity of the phenomena that emerged during the research process, so ideas from a different set of literatures about memory processes, storytelling, and intersubjective communication were incorporated. This also led to some changes to the research question, the interview and observation protocols, and the relevance of the second puzzle about forgetting coupled with inertia. However, during data processing and analysis, there remained some mysterious phenomena, typically centred around the way that technology and workers interacted in practice, the meanings of the explicit and tacit memories that they were interacting with, and how these interactions were shaped by identity. This evidence emerged under the existing line of questioning and research approach, so there was no need for further changes. Instead, what was needed was a novel interpretive perspective. A perspective based on the idea of tacit knowing was explored, but was found inadequate to explain how a worker using a tool in situated practice revealed a different kind of memory than that which is present under existing definitions. An alternative perspective grounded in

fundamental ontology resolved issues resulting from the epistemological assumptions of preceding perspectives, opened up a means to better understand the phenomena, and provided a new typology of organizational memory that could help solve the research puzzles. The following subsections describe the three key phases of the research (design, process, and analysis) in greater detail.

3.1.1. Phase 1: research design – a static perspective

In the design phase of the study, decisions were made about how to meet the goals of the study within the research context. The context for the research was the implementation of new digital tools to store records for later use (case management and administrative data systems) and to retrieve records to support decision making (predictive analytics tools). This research design drew upon well-established approaches, such as in how to select cases for theory development (Eisenhardt 2021; Flyvbjerg 2006; Tsoukas 2009). It also adopted a well specified, but general research question to allow for surprising findings to emerge (Gioia, Corley, and Hamilton 2013). However, it did not position itself with an atheoretical grounded theory approach (Glaser and Strauss 1967), but instead embraced the existing theoretical foundation and proceeded abductively (Timmermans and Tavory 2012). Finally, it included observational methods to better understand the historical beliefs, practices, and traditions that guide public sector work (Bevir and Rhodes 2010). The remainder of the section describes the abductive approach, the motivation for adopting a multi-sited comparative case study model, and the methods used to achieve the research objectives.

Abductive approach

The research began abductively with a focus on the influence of information technology change on the explicit memory in public sector organizational settings, but with an expectation that findings would challenge initial assumptions. Existing theories of organizational memory retention (that included storage media such as rules, roles, and

records) and the puzzle about digitization and forgetting were used to inform the initial research questions and code book.

Multi-sited comparative case study model

Aside from this initial decision, the research involved three principal design choices to enable a meaningful breadth of comparative data about the central research question of what is behind the unintended consequences of information system change that sometimes prevent it from achieving its stated aims. First, the case of public child protection services was selected because of ongoing digital changes to its practice model both in terms of how data is stored and communicated (e.g., case management system changes) and how it is retrieved for use (e.g., predictive analytics). Second, the child protection sector commonly uses historical data both for service delivery (e.g., case file history review, case level decision making) and administration (e.g., performance monitoring). Third, there was a convergence of machine and professional bureaucracies and a divergence of database and narrative logics, which aligns with the two main memory perspectives in public administration literature. Fourth, there were both information system and algorithmic change, allowing for a comparison of the implications of each within the same service sector, to highlight similarities and dependencies. Finally, there was the presence of a human element, a practice element, and elements that were not fully legible under existing conceptualizations of organizational memory. Case study was selected to allow for both theoretical revisions to the concept of organizational memory, the emergence of surprising findings, novel interpretations of the phenomenon, and the identification of new avenues for research (Benbasat, Goldstein, and Mead 1987; Ragin 1992; Yin 2009; Flyvbjerg 2006; Tsoukas 2009; Orlikowski and Baroudi 1991). The cases studied were the child protection information network (CPIN) in Ontario, and predictive analytics tools for risk assessment in England.

These cases were also selected because of the possibility of breakdown resulting from technological change, which can reveal background phenomena. While we might not

be able to directly translate background memory phenomena into explicit knowledge, some authors suggest that we can represent some elements of background phenomena, like tacit knowledge, through refocusing and interpretation that occurs in moments of breakdown (Tsoukas 2005; 2011; Crane and Bontis 2014). Breakdown forces us to bring background phenomena to focal attention and “although skilled performance is ultimately ineffable, it nonetheless can be talked about: through dialogically reminding ourselves of it, we notice certain important features which had hitherto escaped our attention and can now be seen in a new context." (Tsoukas 2011, 472). Tsoukas suggests that "[n]ew knowledge comes about not when the tacit is converted to explicit, but when tacit knowledge is re-punctuated (articulated) through dialogical interaction." (Tsoukas 2011, 473). The disruption occasioned by technological change was expected to allow workers to bring typically subsidiary features of their work using the technology to attention and communicate them to each other and the researcher through dialogical interaction.

Second, a comparative approach was adopted across Ontario, Canada and England, UK to study the same phenomenon in different settings with theoretically interesting similarities and differences (Eisenhardt 2021). The comparative approach ended up being asymmetrical in its execution, as observational research was not possible in the UK due to COVID-19 restrictions (described in greater detail in the section on COVID-19 impacts). Figure 1 presents key similarities (in blue) and differences (in orange), as well as some additional differences that, while not central, were worthy of note.

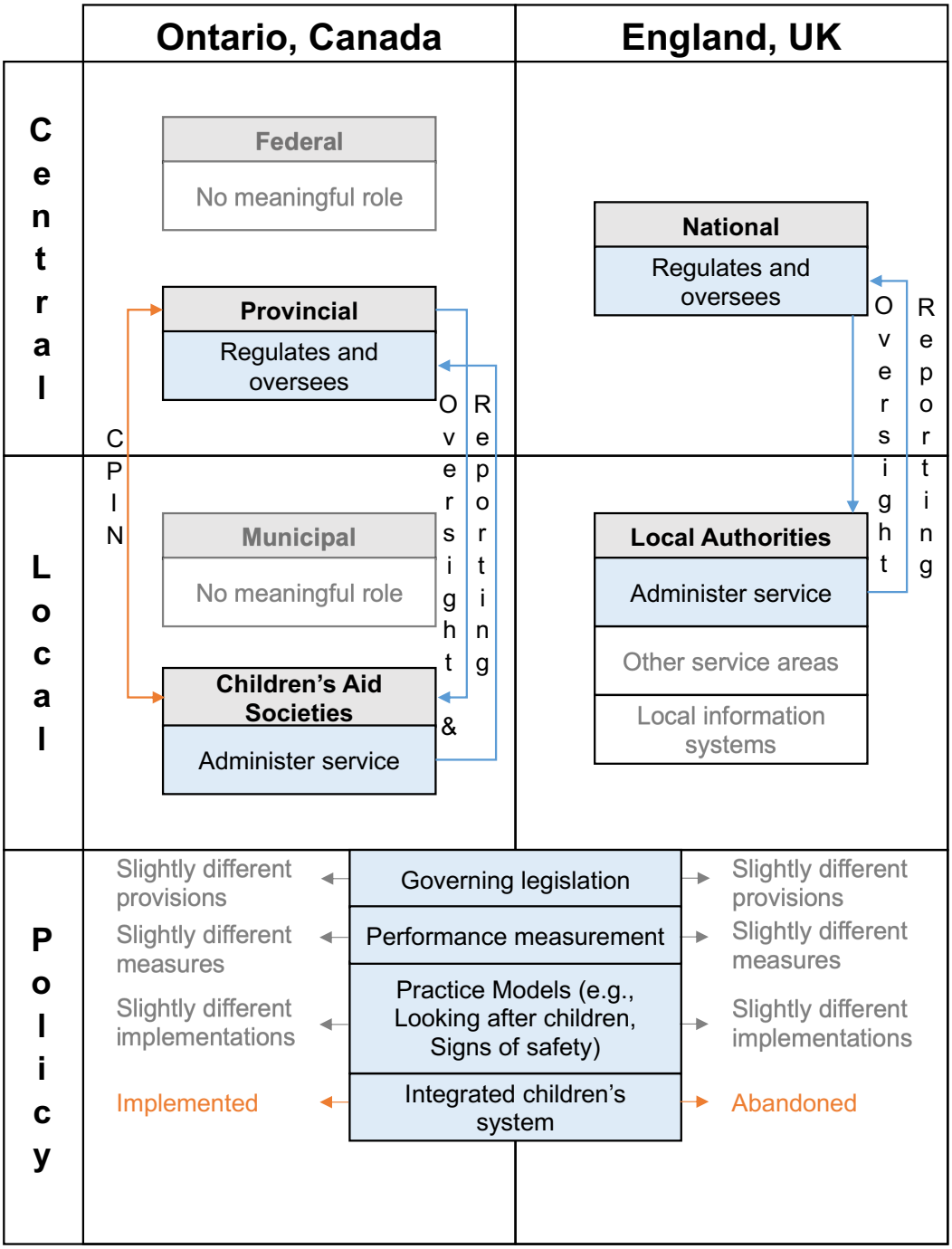


Figure 1: Similarities and differences between child protection systems in Ontario and England

Figure 1 illustrates how there is a similar presence of data, policy contexts, central regulation and oversight, and decentralized local administration of service. Figure 1 also presents the key difference related to a centralized approach to information technology implementation in Ontario and a decentralized approach in the England, where there was an earlier attempt at an integrated children's system in England that was ultimately abandoned (Parton 2017). The figure also presents some additional differences that exist, for example: the Canadian federal government playing no meaningful role, as a result of the constitutional separation of powers; local authorities with elected officials in England, compared to not for profits with volunteer boards of directors in Ontario; and slightly different details surrounding legislation, performance measurement, and approaches to service delivery. One reason for looking at centralized versus decentralized information technology implementations is that studies in digital government have found that centralized approaches offer stability and decentralized approaches offer greater innovation (Yang, Pardo, and Wu 2014), with these concepts being related to the ideas of exploratory and exploitative learning and the interaction of pre-existing organizational and individual beliefs (March 1991).

Finally, the decision was made to look at multiple sites because in both cases organizational memory crosses organizational boundaries. For example, data collected by front-line social workers was used at both service delivery and administrative levels to inform decision making. This was intended to tease apart the characteristics that are unique to centralized and decentralized information technology approaches and those that may provide a deeper understanding of the concept and phenomenon of organizational memory. This aligns with calls in organizational studies to explore "processes that engage multiple levels of analysis" and that "highlight the embeddedness of actors in multiple systems of meaning" (Aten, Howard-Grenville, and Ventresca 2012, 80). Additionally, given the differences in practice that can exist in different organizations within the same sector or field (Hughes 1977; Barley 1986; Hughes 1987; Robey and Sahay 1996; Orlikowski 2000), this

study looked at multiple organizational contexts to try and identify key features of the phenomenon of organizational memory, as opposed to features that were unique to a specific agency.

A multi-sited approach was well suited to this research, because preceding work on culture, organization, and e-government could easily translate to how memory is intra- and trans-organizationally distributed in this setting (Marcus 1995; Bekkers and Homburg 2005; Winter et al. 2014; Appadurai 1988), though there has been limited empirical uptake of this approach in studies of digital government (Meijer and Bekkers 2015). Ultimately, adopting a multi-sited approach is about the connections among the sites (Marcus 1995).

A multi-sited approach also facilitated the identification of memory-related boundary activity between different groups (Carlile 2002; Bechky 2003; Barrett et al. 2012). Memories were not necessarily objectively given, but were deeply perspectival and dependent on situatedness (Basu 2013). There were three key sites of memory use in public sector child protection organizations: service delivery, administration, and strategic decision-making across two orders of government – central and local. These boundaries were grounded in concepts of specialization within public sector organizations and stages of the policy process (Lipsky 2010; Brooks 2007; Rhodes 2005). Boundary activity was expected to help reveal these different perspectives. Table 4 presents how sites and orders of government were divided along their different spheres of focus.

Table 4: The three key sites of memory use by order of governance with their spheres of focus

Site	Local	Central
Service delivery	Case level	
Administration	Case level & agency level	Agency level & service system level
Decision-making[8]	Agency level	Service system level

In general, service delivery was focused on clients and cases, local administration was focused on agency level performance, central administration was focused on provider performance, local decision-making was focused on organizational objectives and local needs, and central decision-making was focused on the service sector as a whole. Within these different spheres of focus there were different professional groups and, as a result, different privileged forms of knowledge (Parton 2006; Vogl 2020a), institutional logics (Reay and Hinings 2009), or identities (Gill 2014) and ways of using equipment (Heidegger 1962; Dreyfus 1991; Riemer and Johnston 2017). Understanding these different perspectives shed light on different participant interpretations of organizational memory and the different kinds of memory, while also helping to illustrate the trans-organizational nature of memory. Shifting between these complex sites, while retaining the thread of organizational memory, required the dexterity of a multiple methods approach that could explore what was formally codified in text, what was perceived by those in the sector, and what practices were adopted and enacted (Basu 2013).

[8] Political decision-making (board and electoral) was not included in this study. The decision-making site was restricted to senior managers.

Methods

Document analysis, interview, and observation were selected to support this abductive multi-sited comparative case study approach. This set of three methods was selected because understanding the implications of digital change on stored memory was expected to require an exploration of the material, experiential, and practice-based implications across the service sector. This thesis adopted approaches that would be able to connect with both the informational and the experiential elements of organizational memory in the selected public sector settings. Drilling down into these details required an analysis of the documents and interfaces that people interacted with, the stories they told, their reported experiences and perceptions working with this technology (or the output of this technology), and observation of how they integrated this technology, its categories, and its outputs into their actual practice. Combining these approaches also helped enable surprising findings to emerge, for example when stated aims diverged from what was observed in practice. These methods were used concurrently and iteratively to focus and deepen the inquiry.

Document analysis played both a practical role, identifying potential participants and establishing research boundaries, and an analytical role, as documents carry different meanings depending on their source (Brinkmann and Kvale 2015; Hine, Kendall, and boyd 2009; Winter et al. 2014). They could be understood both on the representational level (what they were about), but also on an interpretive level (what they tell us about the identities, experiences, values, and interpretations of those who created them) (Foucault 1991; Karppinen and Moe 2012; Laffey and Weldes 2004).

Interview was used to elicit worker perceptions and descriptions of their experiences (Brinkmann and Kvale 2015). It also provided insights into how organizational memory was interpreted, enriched details not fully elaborated in the document analysis, and corroborated or disconfirmed information (Brinkmann and Kvale 2015). Some interviews with participants from the same teams were conducted in focus groups to create ‘‘a natural conversational

setting for storytelling and to encourage participants to talk with each other as practitioners'' (Tanner et al. 1993, 274). Interviews were also conducted during observational work.

The observation that was possible in Ontario contributed to a deep understanding of how CPIN integrated, or failed to integrate, into the everyday work practices of staff. Observation sessions were based on an adaptation of the walkthrough or go-along techniques (Jørgensen 2016; Light, Burgess, and Duguay 2018). Specifically, observation was conducted with workers at their work stations allowing me to watch them navigate their digital and analog tools and interact with colleagues. Observation was intended to primarily focus on types of memory that were less easy to express in writing or speech because, as Pollitt found, "[a] point of some importance is the difficulty of finding research methods to detect the foregoing mechanisms [of memory loss] in operation" (Pollitt 2009, 209). Short-term participant (as an active member of a workload study team) and non-participant (researcher observing work) observation was used to inform this research (Miles 1990; Pink and Morgan 2013; Light, Burgess, and Duguay 2018; Higginbottom, Boadu, and Pillay 2013; Wall 2015). This enabled targeted data gathering in the multiple sites that made up each case. This also allowed the trajectory of the information system mediated memory to be followed (Marcus 1995; Appadurai 1988). Further, observation was intended to make use of the researcher as instrument and draw on 'being there', because part of the value of doing interpretive observational research is that the researcher is not just converting phenomena to representation, but is trying to better understand phenomena and convey that through a combination of writing, examples, and images.

Enabling factors for short-term observation were having a clear focus from the outset (Miles 1990), and having prior experience in the field (Pink and Morgan 2013). This type of approach was possible in this setting because, first, discussions could be anchored around the worker's use of, or relationship with, the information system, and second, I had previous experience as a public servant working in this sector and could use those experiences to

create bridges “to understand the principles of what participants are seeking to achieve” (Pink and Morgan 2013). The advantage of this observational fieldwork was that it revealed the embodied relationship between workers and their equipment and how this fit within their everyday workplace environment.

3.1.2. Phase 2: the research process – responding to dynamic and tacit phenomena

This section presents key details about how the research progressed, including the research in action, the analytical moves, and the sampling strategy. As mentioned, much of the research, and all observational work was carried out in Ontario, as similar planned in-depth work was not possible in the UK due to COVID-19 restrictions. As a result, many of the examples in this subsection refer to Ontario.

Research in action

The excerpt below provides a picture of the researcher in action.

> I was sitting in the lobby of a Children’s Aid Society, waiting for an interview and observation session to start. A parent was seated away from me, waiting to have a supervised visit with their child. The front door opens, and a person walks in carrying a child in a car seat. Moments later, there is a ‘beep’ at the internal door next to the reception desk. A social worker with a lanyard and notebook walks out from behind a locked door to meet the parents and the person delivering the child. They walk down the hall to a glass room with toys and CCTV.
>
> My participant comes out from the same locked door, greets, me and invites me in. We walk down a hall and open a door onto a maze of cubicles. We walk to their space and I sit with them at their desk. There are paper files, a notebook, two monitors and laptop, their desk phone, a mobile phone and pictures of their children. We have a conversation, go through the consent, I turn on the recorder, and then we start the session. The hum of other workers talking on the phone or with each other surrounds us, as we look at the elements on the screens and discuss what they mean.

In Ontario, the interview and observation sessions went roughly as follows: I would sit with either one, or a group of workers, typically in a meeting room, but sometimes at an individual's desk and complete the first stage of the semi-structured interview protocol. The first stage asked questions about educational and professional background, current role, features of organizational memory, and features of current quasi-paradigms in public administration. These interviews were typically in-person because I was in the field and visiting the agencies. Some interviews were conducted with groups of workers, similar to focus groups. However, the first stage of the interview protocol was sometimes carried out by phone or using video conferencing software because it did not involve an observational component or it occurred when meeting in person was no longer possible due to COVID-19 restrictions.

After completing the first stage of the interview protocol, I would then carry out the observational component. I would ask the worker to show me their workstation, which was sometimes at a cubicle, sometimes in an office, and sometimes involved simply opening a laptop at the table where we had conducted the interview because they did most of their work remotely and it was the best simulation of how they interacted with the technology. Based on elements of the walkthrough, go-along, grand tour, and think-aloud techniques (Light, Burgess, and Duguay 2018; Jørgensen 2016), workers were asked to log in to the software and demonstrate some of the everyday uses, in best case scenarios actually completing assigned work, while simultaneously taking time to explain the various steps in the process. During this time, the second and third stages of the interview protocol were completed. The second stage was a set of prompts while observing the worker interacting with the information system. The third was a set of concluding questions at the end of the observation session about memory, communication, behaviour, frustrations, and what they would change about the system, if they could.

Only the first interview stage was completed in the UK due to the impact of COVID-19. While rich observational fieldwork in the England was not possible, greater familiarity with the sector, the types of IT, worker experiences, and the flow of information, gained through the Ontario fieldwork, allowed for more sophisticated and targeted lines of questioning that provided valuable comparative data for the first three types of organizational memory: static, dynamic, and tacit memory.

Efforts were made to address key concerns in interview methods. While interview data was anticipated to include some issues of reliability (Berry 2002) and completeness of responses relative to the questions asked (Harvey 2011), the inclusion of different data sources, such as observation and documents, enabled the identification of discrepancies and helped to make sense of them (Lincoln and Guba 1985; Fitzgerald and Dopson 2009). It was also a way to directly interrogate the stories people told in, around, and about the information system. As the research progressed, it was possible to ask interviewees to reflect on their practices and a preliminary set of researcher analyses, as generated from the preceding interviews and observations, to sense-check my interpretations and elicit participant feedback and reflexivity (Riach 2009).

Efforts were also made to address common concerns about observational methods. Approaches like the walkthrough or go-along techniques can be labour-intensive with a great deal of the onus on the participant. This could have resulted in participants taking short-cuts or otherwise modifying their workflows in the interest of saving time, keeping up appearances, or any number of other intrapersonal motivators beyond simply providing an honest and unfettered glimpse of their work practices. The duration of the observational sessions, steps two and three of the protocol, was around an hour, which provided sufficient time for workers to become comfortable with my presence. Further, during some observation sessions, work came in that needed to be actioned immediately, this often immersed the worker in their task and offered a more authentic view of the work that they needed to do.

Where work may have been more staged, workers were asked to describe their frustrations and provide examples. These short walkthroughs of particular issues could be corroborated against the experiences of other observed workers, as well as official documentation, to identify the sources of memory dysfunction and the authenticity of the observed practices. There were also noticeable differences between participants where some immediately understood that I wished to observe their everyday practice and jumped into their tasks, while others treated the session more like an interview or performance. However, observation, when combined with the other methods, also helped to reveal background organizational memory phenomena, such as equipment dysphoria and subtle influences on socialization stemming from the embedded values in technological systems.

When conducting the observational work in Ontario, the introduction of the new technology was expected to have impacts not only within its environment, but within the broader memory infrastructure of the organization. Workers were thus asked to also describe the other tools that they used to carry out their work. This often included additional monitors at work stations with other software open, such as email, shared drives, word processors, and legacy case and record management systems, but also cell phones, which often sat next to worker laptops, landline phones at desks, paper files, and note pads. For an illustration of one workstation, see figure 2.

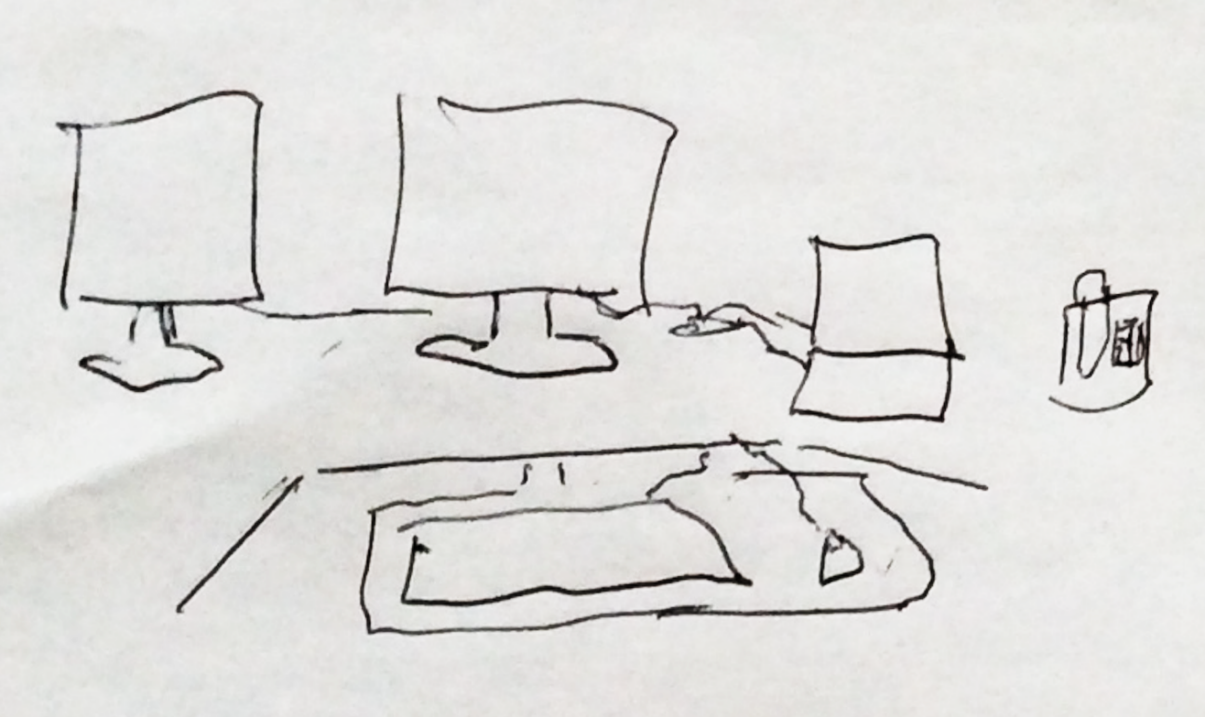


Figure 2: Workstation sketch by Thomas Vogl from field notes, 5 November 2019

Depending on the physical layout of the workspace, the worker would interact with colleagues in order to trouble-shoot or get work done. This helped to demonstrate the dynamic interconnection of roles and how people in different roles understood and interacted with their equipment. Documents helped contextualize and situate the sometimes selective or conflicting stories in the sector surrounding the information systems. This approach of looking at the broader work context was particularly applicable in this setting because of the structured workflows that were both built into the information systems and supplied outside the system in guidance documents and the knowledge of colleagues.

Exposure to the tools, guidance documents, and interactions with others contributed to a deep understanding of how CPIN integrated, or failed to integrate, into the everyday work practices of staff. Even though the original framing of the research (with memory as a repository of rules, roles, and records) was ultimately inadequate and needed to be expanded, the original constructs were not abandoned and did enable meaningful findings to emerge and the research to progress. Different types of rules became apparent, whether

formal regulatory standards, agency procedures, information system constraints, or worker habits. Workers in different positions had different interpretations of the value and purpose of those rules. Seeing interactions and discussing the most closely related roles gave insight into what actions and priorities were most important within organizations. Finally, the ability to see records being made and used was beneficial to understand how evidence was interpreted in different parts of the organization and was equally useful when trying to determine the origins of certain data quality issues with trans-organizational implications. Such issues typically appeared in one functional area of the service system, for example difficulties with data recording and the practical flow of front-line work, but were the result of actions in another part, mainly the imposition within the information system of administrative priorities for compliance with formal written standards, further emphasizing the need to follow the data and highlighting the importance of a multi-sited approach. This deep study helped to create a picture of the various impacts of information technology on organizational memory and supported a reimagining of the kinds of memory phenomena in organizations.

Analytical development

As assumptions changed in response to the empirical findings, there were three key adjustments in the analytical approach. Initially, I had relatively simplistic assumptions that memory was data or records. As I began to collect data, I noticed certain phenomena where workers, technology, and context had an important connection and this led me to look at processes, narratives, and tacit types of memory, and to explore critical realist assumptions about sociomateriality (e.g., how sociomaterial phenomena are imbricated and reconfigured over time). But, while these assumptions purported to focus on practice, there was a tenuous relationship between the social and the material, the explanatory power of the theory in practice, and the underlying knowledge focus. Non-conscious practice and being seemed crucial, so a different set of philosophical assumptions was adopted to better understand some of the empirical phenomena. The moves eventually settled on a perspective grounded

in fundamental ontology that helped make sense of memory phenomena by breaking forms of memory up by ways of being. The remainder of this section describes in greater detail the motivations for the analytical moves subsequent to research design.

After the first few interviews, it became apparent from participant responses that the processes of organizational memory, from acquisition, through storage, to retrieval, as well as the more narrative and tacit mechanisms of memory storage were also going to be important in understanding the phenomena. As a result, overall research questions, interview and observation questions, as well as potential codes in the codebook were adjusted to incorporate these changes. However, this led to intermediate analysis that remained somewhat limited by its knowledge focus (Vogl 2020a). Despite these changes and the progression of the research, it became apparent through some responses and the observational fieldwork in Ontario that participants were unable to articulate or fully grasp some of the phenomena that were leading to issues in the rollout of the information system. Some things remained implicit in discussions and observation of the phenomena and challenged, or could not be easily explained by, existing theoretical perspectives, for example why certain practices persisted, or why workers were frustrated with the system, despite the project having followed a relatively textbook process of development and implementation. This suggested that some underlying assumptions needed to be adjusted and that a revised approach to data analysis needed to be undertaken to help make sense of anomalous findings. This was accomplished through a reinterpretation of the data using a perspective grounded in fundamental ontology.

3.1.3. Phase 3: shifting assumptions for a deeper analysis of the data – implicit interpretation

This section describes the analytical perspective and associated approach that replaced prior assumptions and that acts as the foundation for the organizational memory typology in this dissertation. Analysis of the data involved three moves. The first was a

response to initial data that suggested revisions to accommodate broader theoretical concepts. The second involved a realization that some surprising phenomena could not be easily explained by the existing conceptualizations. The third move was to overturn initial assumptions and expand the philosophical foundation to try and account for these surprising findings through a secondary analysis and interpretation. In the third and final analytical step, this research adopted a perspective grounded in fundamental ontology (Heidegger 1962), which permitted an interpretation suggesting that there are two implicit forms of memory that had hitherto not been described. The interpretive approach associated with this perspective is the phenomenological-hermeneutic circle.

This analytical approach was made possible by dividing ontology into three distinct ways of being: the present-at-hand (information), the ready-to-hand (tool use), and Dasein (self-interpretation). This approach acknowledged the two "ways that IT can ‘be’ in practice—object of reflection or equipment in fluent use”, which enabled the study of “how people encounter IT in their local worlds" (Riemer and Johnston 2017, 1077). The reason for this was to explore whether a focus on being-in-the-world and the ready-to-hand could help to reveal a background to meaningful activity that is hidden in plain sight, but deeply related to organizational memory.

Implicit ways of engaging with the world assume a largely hidden background, and Heidegger believes that this background can be revealed through phenomenological interpretation, specifically a hermeneutic circle. As Dreyfus has suggested, “what phenomenology deals with must be something that is not already obvious“ (Dreyfus 1991, 32). In order to understand this non-obvious background, Heidegger proposes a hermeneutic method that “is an alternative to the tradition of critical reflection in that it seeks to point out and describe our understanding of being from within that understanding without attempting to make our grasp of entities theoretically clear” (Dreyfus 1991, 4). Heidegger recognizes that this method must be hermeneutic because

> *he can only point out the background practices and how they work to people who already share them – who, as he would say, dwell in them. He cannot spell out these practices in so definite and context-free a way that they could be communicated to any rational being or represented in a computer. In Heidegger's terms, this means that one must always do hermeneutics from within a hermeneutic circle. (Dreyfus 1991, 4)*

According to Dreyfus, "phenomenology becomes a way of letting something shared that can never be totally articulated and for which there can be no indubitable evidence show itself" (Dreyfus 1991, 30). This approach is distinct from those drawn from the natural sciences because, "studying human beings as self-interpreting beings requires interpretation within *the full hermeneutic circle* of shared significance, whereas to have a science of any object including human beings as objects requires only the circularity of working within a theoretical projection" (Dreyfus 1991, 203).

The iterative interpretive practice applied in this research was consistent with the hermeneutic circle. Dreyfus describes this process as follows:

> *In general, the so-called hermeneutic circle refers to the fact that in interpreting a text one must move back and forth between an overall interpretation and the details that a given reading lets stand out as significant. Since the new details can modify the overall interpretation, which can in turn reveal new details as significant, the circle is supposed to lead to a richer and richer understanding of the text. (Dreyfus 1991, 36)*

The abductive approach that was adopted permitted this type of analysis and associated shift in assumptions. Unlike the traditional hermeneutic circle,

> *the phenomenological-hermeneutic circle involves a stronger methodological claim: (1) Since we must begin our analysis from within the practices we seek to interpret, our choice of phenomena to interpret is already guided by our traditional understanding of being. (2) Since it deals with what is difficult to notice, this traditional understanding may well have passed over what is crucial, so we cannot take the traditional interpretation at face value. (3) Thus we must be prepared to revise radically the traditional account of objects, subjects, language, space, truth, reality, time, and so on, on the basis of the phenomena revealed by our interpretation. (Dreyfus 1991, 36)*

This interpretive perspective allowed for two important activities in the research. First, it provided a means to both build on the traditional conceptual approach to organizational memory and explore a more phenomenological understanding of that which forms the

background of everyday practices, all while conforming with the objectives of the abductive approach. It allowed for different interpretations of the same research data through the lenses of different forms of memory. Second, by incorporating the organizational memory role of this background, there was a way to better understand epistemological pluralism among different groups, how different backgrounds may lead groups to have different interpretations and potential conflicts where these worlds overlap, and why certain equipment may not fit into the practices of these groups. Ultimately, implicit memory can help to explain how we can have forgetting during periods of digitization, and administrative inertia at the same time as a loss of touch with history.

Targeting the right phenomena for hermeneutic analysis required a fundamental shift in perspective. In terms of the research analysis, looking at technological change in public administration phenomenologically required identifying 1) the ‘with-which’, or the item of equipment, 2) the ‘in-order-to’, or what the equipment is used for, 3) the ‘where-in’, or the practical context, 4) the ‘towards-which’, or the immediate objective, and 5) the ‘for-the-sake-of-which’, or the identity-related final point stemming from a person’s self-interpretation that orders their activities (Dreyfus 1991). 1 and 2 are related to equipment, 3 is related to world, and 4 and 5 are related to socialization. These elements are bound up with a type of memory that makes activity in this setting intelligible.

Hermeneutic phenomenology is different from other similar interpretive approaches. Unlike the decentred approach proposed by Bevir and Rhodes for political science research in government, an approach based on the phenomenological-hermeneutic circle does not focus on agents taking actions based on webs of beliefs founded in traditions and in response to dilemmas (Bevir and Rhodes 2010). Instead, it places greater emphasis on the interpretation of meaningful activity, than on knowledge-focused processes such as beliefs and narratives. Further, unlike inductive approaches in organizational studies (Eisenhardt 2021), this approach does not place as much focus on knowledge and theoretical clarity, but

instead on revealing the phenomenon so that it can be better understood. It does not assume that organizational actors can always explain their thoughts, intentions, or, most importantly, actions (Gioia, Corley, and Hamilton 2013). This approach is also distinct from other phenomenological approaches suggested for organizational research (Gill 2014), because it attempts to extend beyond methodological individualism towards an understanding of world, collective background socialization, and shared experience. Ultimately, hermeneutic phenomenology is about revealing what may be overlooked by existing conventional theoretical understandings and approaches, problematize those understandings, and revise underlying assumptions in the process of analysis, leading not just to new theory, but to a revised position vis-à-vis theory.

During this phase, this study also adopted some elements of discourse analysis because they supported a phenomenological analysis of not only representational practices, but the background that grounds socialization and equipment use (Laffey and Weldes 2004; Foucault 1991). Documents carry different meanings depending on their source. They could be understood both on the representational level (what they were about), but also on a phenomenological level (what they tell us about the identities, experiences, values, and interpretations of those who created them) (Karppinen and Moe 2012). The combination of existing historical analyses and policy documents, sector media sources, and data element changes over time enabled a genealogical approach to how certain things have come to be thought about and represented in the sector (Foucault 1991; Nyman et al. 2021).

This perspective and approach grounded in fundamental ontology highlighted how looking at phenomena as knowledge may itself be a limitation and that action should not be seen as a type of knowledge, but as something distinct and more related to being in the world. However, this also posed challenges in terms of reporting. It meant that I would be trying to describe a worker's use of a technological tool, applying an analytical dualism, when in fact, in the action of using the tool, the worker and the tool became one towards the

completion of some goal. The writing and evidence provided in the empirical chapters attempts to convey these embodied phenomena without simply reducing them to a set of concepts, categories, or characteristics, but instead by also providing vignettes of workers using equipment in practice (Van Maanen 2011).

3.2. Summary of data collection and analytical approach

This section describes the sampling strategy, the data that was collected over the course of the research, and some practical aspects of the analytical and interpretive approach.

3.2.1. Sampling strategy

Purposive sampling was undertaken to the greatest extent possible, with some snowball sampling. Purposive sampling was used to identify individuals across different functional areas within an organization, as well as individuals across organizations, to clarify where phenomena were unique to a specific agency and where experiences could be corroborated or contrasted across agencies.

The sampling strategy for both interviews and observation was purposive. It targeted individuals identified during both document analysis and preliminary access discussions based on their organization, their jurisdiction, and whether they were involved in delivery, administration, or strategic decision-making. This approach was taken in order to ensure that participants were interviewed and observed in the positions necessary to achieve the purpose of the study (Brinkmann and Kvale 2015). This sampling strategy was to ensure that it would be possible to study the influence of digital change on organizational memory and its trajectory for different groups (i.e., service delivery and administration) while also ensuring a sufficient diversity of participants to corroborate or disconfirm findings. This was also intended to determine whether and, if so, how memory differed depending on the organizational position and whether an interpretation of these differences could offer greater insights that could enhance the overall understanding of organizational memory.

At the front-line, interviews and observations across different organizations in Ontario allowed for better insight into practices and interpretations unique to those agencies, as well as practices and interpretations that were common across organizations. The intent was to interview and observe front-line staff in at least two organizations with different characteristics including size, service volume, and region and compare those findings against a select group of interviews with members of other agencies. Within the organizations that agreed to participate, efforts were made to interview and/or observe front-line staff in each of the different functional areas presented in figure 3, below.

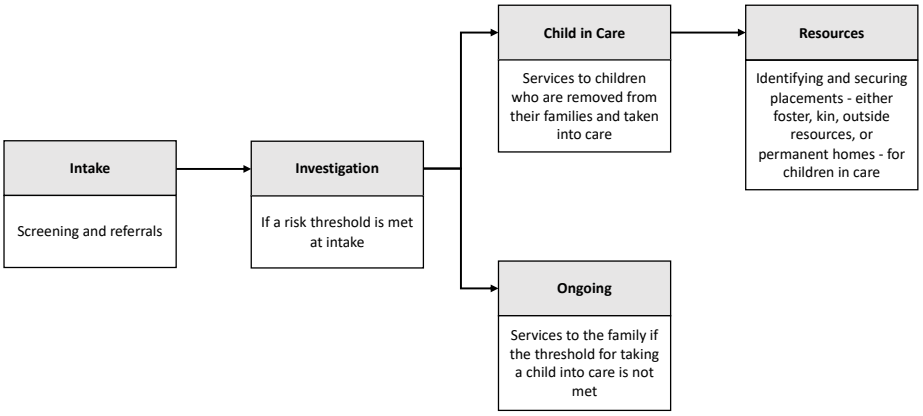


Figure 3: Schematic overview of front-line services in Ontario's Children's Aid Societies

During recruitment, agencies would sometimes select participants. If these workers were in some way not representative, then this may have introduced biases into the findings. This orchestration by the agency could have resulted in the selection of top performing or loyal staff and could have resulted in biased information about the performance of the system or could have been politically motivated and designed to generate data that could be leveraged in discussions with the ministry. For participants who were not selected by the

agencies, there may still be self-selection biases, where those who volunteered had different characteristics than those who did not. The decisions to carry out research in more than one agency and to find participants both with the assistance of agencies and through alternative voluntary calls were expected to mitigate some of these limitations. The diversity within the group of participants, in terms of background, length of tenure, and technological proficiency, provided some confidence that the participants represented the right mix to support research into technological change and organizational memory. While observational research was not conducted in a small agency in Ontario, only mid- and large-sized, interview commentary provided some indication of the impacts for smaller agencies. Operational staff at the agency, including quality assurance, information technology, records management, and data analysis, as well as management, from supervisors to executive directors, were also sampled. There were noticeable disproportionalities in staffing both within and across organizations. People working in the child protection sector were predominantly women and, in some agencies, racialized. A greater proportion of white men were represented in administrative and leadership positions.

The long implementation of the project in Ontario (between 2014 and 2019) and the different implementation statuses of various Children's Aid Societies could have resulted in differences between participants responding at the beginning of roll-out and some with multiple years of experience in CPIN. Agencies with multiple years of experience with the system were recruited to reduce this issue. One challenge that did emerge was that because the system was not rolled out across all agencies during the research, even those who had been using it for years were still experiencing changes and outages as new agencies came on and updates were made. Where findings were related to the ongoing roll-out, this context is noted. Follow-up research was conducted in 2020 with one of the early adopters to help further contextualize and differentiate between temporary and longer-term changes, though at this point, COVID-19-related issues had eclipsed those of CPIN and there was more

positivity towards CPIN, given its capacity for remote access to records from across the province.

Purposive sampling was also envisioned for the government administration in Ontario and front-line, local authority, and central government administration in England; however, this strategy had to be revised in response to unanticipated events. In Ontario, there was a change in government that led to a policy across government of no speaking with experts or stakeholders about policy. Instead, a convenience sample was conducted of staff willing to speak off the record and staff who had been involved in the CPIN project, but who had since moved on or retired. Legacy system vendors and other agency associations were also sampled.

In England, COVID-19 restrictions prevented observational fieldwork and interviews had to be scaled back, as many potential participants were preoccupied with responding to their sector-specific guidance about work during the pandemic, especially at the front line. Local authorities that were pursuing predictive analytics projects or that were changing their information systems to enable this type of analysis were selected for outreach, as well as the Department for education, Ofsted, and predictive analytics providers.

3.2.2. Data collection

Document analysis was conducted on inquests, various reports (including audit and inspection), news releases and internal documents. This set the groundwork for the context of the project, including its history, motivations, objectives, aspirations, and challenges. In total, more than 500 (535) documents were collected and analyzed (including 70 UK documents, 99 publicly available documents related to CPIN, 97 documents related to governance and digitization in child protection and social services in Ontario, 216 internal documents shared over the course of the research, and 53 images of workplaces, workplace documents, information infrastructure, and interfaces). The types of documents that were analyzed included government publications about digital change; inquests, reviews, and

reports on child protection related deaths; media framing of these child deaths; line ministry or department and agency or advocacy group publications on socio-technological service reform; standards and assessment forms, as well as other policy documents related to crises and transformation in the child protection system (CCAS 2014; CPSCW 2012; OAGO 2015a; Ofsted 2017b; Munro 2011). Documents consulted also included legislation and standards (Ontario 2017; MCYS 2016a; 2016b; OACAS 2016), as well as secondary historical analysis (Johnston 1983; King et al. 2003; Swift and Parada 2004; Fallon et al. 2017; Trocmé et al. 2019). During the research, some internal documents were also shared, including evaluation reports, process maps, correspondence about system issues, guidance documents with descriptions and screenshots, and organizational charts. This material provided important historical context for organizational memory and the influence of digital change.

Interviews and observations were conducted between July 2018 and September 2020 in Ontario and England. In all, 58 respondents were formally interviewed and/or observed with consent. 56 were interviewed and observed in Ontario across 8 out of 50 Children's Aid Societies (CASs), the Ontario Association for Children's Aid Societies, the Ontario Ministry of Children, Community, and Social Services, information system providers, consultants, and researchers. The breakdown of participants by position is 21 front-line social workers, 4 front-line supervisors, 21 operational staff (including quality assurance, information technology, and system trainers), and 2 executive directors from CASs, as well as 8 individuals from other organizations in the sector. There were also informal interactions with 19 participants from the ministry and Indigenous Child and Family Well-Being Agencies who did not wish to be recorded or identified. In-depth fieldwork occurred in two different children's aid societies at two distinct periods of time. The early stages of the research involved multiple sessions of interview and observation. The middle stages were similar to the early stages, but included modified questions and follow-up research with some

participants. Late stages of the research included targeted research on specific topics and re-analysis of previous data through a different interpretive lens.

Interviews were conducted with 26 participants in England, with permission to use 3 secondary interviews from the Data Science for Local Government project (Bright et al. 2019), 2 original interviews with consent, and 21 informal interviews where consent for recording and identifiability was not provided. Interviews were completed with participants in England in local government, central government, and the third sector (NFPs, public purpose corporations, research institutes, and universities).

Table 5: Formal and informal interviews by jurisdiction

Jurisdiction	Formal Interviews	Informal Interviews
Ontario	56	19
England	5	21

Other planned interviews and all observation sessions were not possible due to the measures and disruption resulting from COVID-19. Due to the lack of observational data in England, comparison is limited to the first three types of memory: static, dynamic, and tacit. While certainly disappointing, lacking observational data in England did not interfere with the ability to use the English data to 1) argue that there are limitations (i.e., a failure to resolve the puzzles around forgetting, inertia, and digitization) when only focusing on memory in terms of these first three types; and 2) help set the foundation for the presentation of the implicit types.

Formal semi-structured interviews and observation sessions were recorded and transcribed. Interview and observation sessions were broken into three stages that each lasted between 30-45 minutes and followed a semi-structured protocol. The interview and observation protocols, illustrating changes resulting from the unfolding of the research, are available in appendix 1. Over the course of the research, participants were interviewed

and/or observed, either individually or in focus groups, in 60 distinct recording sessions of which 27 were interviews, 6 were interviews with observation, 18 were observation, and 9 were focus groups. Of these sessions, 38 were initial, 20 were follow-up, and 2 were a second follow-up. In total, there were over 2,000 pages of transcripts numbering over 600,000 words. There were also over 70 separate observational sessions that occurred without audio recordings, including participant observation as a member of a workload study team, attendance at a conference on data science for local government, and a number of interviews where consent was not provided, so only anonymous notes are available.

Fieldnotes were completed immediately after interactions. There are over 100 fieldnotes documents. Where possible during observation, screenshots of key elements of software applications were taken to capture key features of worker experiences during the audio recordings. Where screenshots could not be taken because of the presence of personally identifiable client information, screenshots of dummy data (from training guidebooks or virtual training environments) were used to illustrate the interface that workers were navigating and provide visual context for the things they shared verbally. In addition to the publicly available documents, some participants shared internal documents related to the topics under study. The combination of document analysis, interview, and observation enabled a deep study and helped to create a picture of the various impacts of information technology on organizational memory.

3.2.3. Analysis

Once data were collected, they were uploaded into NVivo 11 for analysis. The preliminary analysis followed a codebook based on existing theory about explicit forms of organizational memory storage (Walsh and Ungson 1991), as well as theoretical foundations for the study of information technology in organizations (Vogl 2020d). Though these categories were applicable in a child protection context, the preliminary analysis revealed limitations in this initial categorization choice. As a result, questions were revised and the

codebook expanded to include theoretical concepts related to the process of remembering, narrative, and tacit forms of memory in organizations. As this data was analyzed, the codebook was revised to accommodate emergent themes, concepts, and phenomena in the data that were surprising and resistant to categorization under the concepts drawn from the literature (Saldaña 2012), for example unspoken, almost unconscious, situated activities between workers and their equipment. The latter stage analysis involved a phenomenological-hermeneutic circle approach. Rather than requiring the collection of new data, this analysis was based on a second analysis of the same data under different assumptions. This analysis suggested that some of the fundamental assumptions underlying the study of organizational memory could benefit from revision. It also enabled a meaningful re-interpretation of the existing data to achieve a new way to understand the unintended consequences of information system change.

Through this overall approach to data collection and analysis, this study aimed to follow a number of measures of quality in qualitative research, as illustrated in the methodological explanation above, but also through ongoing peer debriefing and plans for archiving the data to ensure auditability, credibility, dependability, and confirmability in the research (Lincoln and Guba 1985; Seale 2002; Ospina, Esteve, and Lee 2018).

3.3. Ethics and researcher positionality

This section presents details related to research ethics and researcher positionality. The research ethics sub-section presents the measures followed to protect data, personal information, and participant privacy during both research and reporting. The researcher positionality sub-section addresses considerations related to how my background might have influenced the research process and interactions with participants.

3.3.1. Research ethics

The main focus of the research was on professional public servants and their interaction with new IT, so standard ethical procedures were followed. Procedures, such as

those related to informed consent and confidentiality, were adopted based on principles and guidelines for research involving humans of organizations including the Social Sciences and Humanities Research Council of Canada, the Social Research Association, the American Political Science Association, the British Sociological Association, the Academy of Management, the Association for Information Systems, and the Association of Internet Researchers. However, given the sensitive nature of the data that these staff were working with, additional measures were taken including foregoing the use of cloud-based services for data collection and processing, signing of non-disclosure agreements with agencies where the personal information of vulnerable children or their carers might be inadvertently disclosed during audio recordings, and removing identifying data about non-consenting individuals (including vulnerable children and their carers) from audio recordings and transcripts. Access was sometimes delayed due to the sensitivity of the data contained in the systems and the need to enter into formal non-disclosure agreements with the agencies regarding client-level data that was incidentally encountered on the information system during the research. Incidentally encountered personal information was manually removed from recordings and transcripts. Also, as noted earlier, for visual representations of the system, identifying information was either redacted, or images were taken from training manuals or training environments with dummy data[9].

Practices related to data retention and reporting adopted both standard and novel ethical conditions. While standards for reporting align with common practice, for example by ensuring the anonymity of participants and some organizations in publications, unlike in standard research projects where identifiable data is destroyed, the informed consent for this research allowed for archiving the data such that future researchers could contact participants for follow-up research. Data will be stored in official archives, such as the UK Data Archive or an archive under the oversight of the Canadian Association of Research

[9] Dummy data was made up cases and person records for demonstration purposes.

Libraries. Archiving will be governed by a research data management plan that will preserve the conditions set out in the original consent (e.g., anonymous reporting) and any specific conditions requested by the participants as part of their consent[10]. Research ethics approval for the approach to informed consent and data processing, handling, and archiving was received from the University of Oxford with reference number SSH OII C1A 18 055.

3.3.2. Researcher positionality

One related challenge was associated with my positionality as a white male Canadian academic researcher in this area, and a former employee in the public sector in Canada. I worked in the Ontario Public Service from 2011 to 2016. During that time, I spent three years working on policy in the children's services sector. While this experience was expected to enable access within the Ontario Public Service, an election two months before I began my fieldwork, that resulted in a change in government, nullified the pilot work that I had completed. My access to government evaporated due to policies that, as some of my former colleagues explained, restricted public servants from speaking with experts or stakeholders about policy. As a result, the early focus of my fieldwork in Ontario was within Children's Aid Societies, about which I had previously only had an external, and to a certain degree adversarial[11], relationship. Most of the data about the ministry came from informal conversations with current staff and interviews with staff who had left the organization. In the UK, my past work experience helped me to build bridges with some central government, Ofsted, and local authority operational level staff. That being said, I did need to do more

[10] It is worth noting that there were also power differentials between participants in terms of how they asked for their data to be handled. Those who understood research, ethical approval, and consents were willing to exercise some control and add conditions to their consent, whereas other participants took the consent at face value. This led me to feel like there was inequity in the research process, despite having included provisions indicating that any participant could add conditions on their consents, because only participants with certain characteristics requested the inclusion of conditions.
[11] I was involved in policy work associated with the introduction of a new funding model that led to funding reductions and cost-cutting initiatives in some CASs (OAGO 2015).

work to understand the unique context of children's social care. I had been doing this familiarization, relationship building, and access work while on fieldwork in Canada.

In front-line child protection settings, my previous experience was limited, so, while I had a technical understanding of the nature of the work, the extent to which I could personally attest to the way in which participants dwell in the phenomenon of organizational memory from their particular organizational standpoint depended on visits to field sites, observation of equipment use in practice, and multiple interviews with some participants. Through this fieldwork, I was able to engage with the embodied relationship that participants had with the technology and feel confident that I could provide some insights into our understanding of technology and organizational memory in these professional public administration settings. In the England, relationship building to access front-line staff took more time and was not achieved before COVID-19 restrictions came into effect.

My background as a policy analyst meant that there was some translation work that needed to be done for social workers to understand the research that I was trying to do and for me to understand the front-line experience. While I was able to draw on my experience working on elements of the CPIN project during my time with the ministry, and while this has shaped my interpretation of findings, I aimed to find publicly available documents and pursued lines of questioning, that corroborated or problematized some of my earlier work experiences and assumptions, in order to try and minimize my own bias and the extent to which findings were informed by experiential evidence that preceded the research.

My positionality could also have influenced responses by participants pertaining to race, gender, ethnicity, or Indigenous peoples. Where these topics came up, I encouraged participants to discuss them, I also sought out diverse views within the organizations, and ensured that participant comments about my background or topics related to race, gender, ethnicity, or Indigenous issues were captured in conversation, fieldnotes, and other research documents.

3.4. Note on COVID-19

This section enumerates the key impacts of COVID-19 on the research. The most significant impact was that the pandemic interrupted planned fieldwork. Upon completion of in-person on-site fieldwork in Canada, I moved back to Oxford in February 2020 to continue negotiating access with field sites in England, initially begun in April 2019, and carry out in-person interviews and observation. Before COVID-19 measures came into effect, I was able to complete two interviews and initiate or continue access discussions with key gatekeepers. After measures were introduced, in-person fieldwork in the UK was no longer possible, potential participants became preoccupied with responding to government guidance on COVID-19, and progress with the English element of the research was more limited than anticipated. I also tried to balance research requests with the ethical considerations around not bothering workers in a crisis situation. Due to COVID-19, the comparison between Ontario and England is limited to the present-at-hand categories, as observation was only carried out in Canada before the pandemic, and observation was crucial to uncovering the phenomenological elements of memory.

Thankfully, sufficient field data was collected in Ontario to provide novel insights into the implicit phenomenon of organizational memory and its relationship with digital change in public sector child protection. In response to the inability to carry out in-person fieldwork in the UK, the project was redesigned into two distinct, but related, parts. The first part is comparative and focuses on enriching our understanding of traditional forms of organizational memory in these settings and highlighting the limitations of these interpretations relative to the guiding puzzles. The second part is centred on the observational work in Ontario and focuses on expanding the understanding of organizational memory to include implicit memory.

In support of this revised approach, I also reached out to my existing contacts in Ontario about the impact of COVID-19 on organizational memory and the relationship with

CPIN. The request made clear that participation was voluntary and that there was no pressure if workers were overwhelmed, and 11 participants provided responses. This additional data was intended to permit a comparison of information system change and organizational memory across these two jurisdictions in the context of COVID-19 measures.

3.5. Concluding statement

This chapter set out the key phases in the unfolding of the research and provided an overview of the data collected and the analysis conducted to compare traditional concepts of organizational memory, identify their limitations, and explore a new understanding of organizational memory that could help resolve this study's puzzles. After a brief discussion of the historical background and context of this research, the subsequent substantive chapters elaborate these comparisons, limitations, and novel interpretations.

Chapter 4: Historical background and context setting

This chapter provides a brief historical background from around the inception of child protection services in both Ontario and England to the technological change occurring in the research period. This illustrates how decisions in the past had implications for what was quantified and remembered thereafter and sets the context and motivation for the introduction of the Child Protection Information Network (CPIN) in Ontario and predictive analytics tools in England.

This chapter is structured as follows: the first part provides general historical background in Ontario and England from the late 19th century to the end of the period of the research. This section includes separate accounts of the history of child protection in Ontario and England and then a summary to highlight key similarities and differences. These historical accounts are focused on details that are relevant to understanding the influence of digital change on organizational memory in the child protection sector over the period of the research. The next section focuses specifically on the research period from 2010 to 2020, providing key details in both Ontario and England about the digital and technological transformations followed by a summary of the most salient similarities and differences. The chapter closes with a discussion of the relevance of these details for understanding the forms of memory presented in the substantive chapters.

4.1. Historical background

This section focuses on the history in Ontario and England. In both histories, the three periods covered are the early days and establishment of the modern service system in

the 1980s, the reforms between the 1990s to 2010, and the changes over the course of the period covered by this research from 2010 to 2020.

4.1.1. Brief history of child protection in Ontario from inception to 2020

Over the history of child protection in Ontario from inception to 2020, there have been numerous changes related to funding, policy, regulation, accountability, and digital change. There has been a swinging pendulum between child safety and preventative family support motivated by either negative press around tragic child deaths or efforts to find efficiencies and reduce cost. There has also been a divergence between outcome expectations and the infrastructure needed to measure and monitor them, and a rationalization of the system from professional judgement towards administrative compliance.

Early days and establishment of the modern service system: 1893-1984

The child protection system was formalized in 1893, when the *Children's Protection Act* first created quasi-public Children's Aid Societies (CAS) in the province that had a mandate to apprehend abused or neglected children, become their legal guardian, and provide residential services like foster homes (King et al. 2003; Swain 2021). The system was influenced by parallel development in the UK (societies for the prevention of cruelty to children), and the USA (the organizations of American child rescuers[12]) (Swain 2021). These societies were originally funded by municipalities or counties (King et al. 2003). The provincial government gradually increased its share of funding of protection services and also promoted prevention, though without providing any additional funds (King et al. 2003; Ontario 1965). The original hands-off nature of the relationship between agencies and the ministry meant that the information infrastructure was focused primarily, if not solely, on

[12] In other Anglo-Saxon commonwealth countries, there were female founders of similar societies who focused more on threats to children's lives posed by poverty and women's oppression rather than the definition of cruelty proposed by the societies for the prevention of cruelty to children (Swain 2021). Women founders politicized through the suffrage movement "were more likely to establish societies that assisted women in providing for their children rather than acting as an agent of the state in punishing them for failing to do so" (Swain 2021, 204).

financial data. The disaggregated nature of the sector predated New Public Management reforms.

When the provincial child protection service was extended to status Indians (McKenzie et al. 2016), the changes that were eventually put in place did not include preventative services, so between the 1960s and the early 1980s, families characterized by "crushing poverty, unsanitary health conditions, poor housing and malnutrition" had their children removed (Johnston 1983, 47). This period, where many indigenous children were removed from their families and placed in non-indigenous foster or adoptive homes, is referred to as 'the sixties scoop' (Johnston 1983). It represents a focus on punitive intervention rather than support services for vulnerable families.

In 1984, the modern child welfare sector in Ontario was formed with the enactment of the *Child and Family Services Act*. This act set out the rules structuring the delivery of services in the sector and tried to balance child safety with family support (King et al. 2003). The ministry collected financial and service volume information to oversee services (Trocmé, Fallon, et al. 1999; Ontario 1951). This was supported by early computerization in some societies (Participant 1, personal communication, 28 September 2018). This initial period demonstrated the first swinging of the pendulum between a focus on child safety interventions during times of crisis and preventative family support. It also demonstrated the expansion of the service, as well as the introduction of basic system monitoring and basic rules about service.

Reforms between the establishment of the modern service system and the research period: 1990s to 2010

Reforms began in response to recommendations following the review of a number of child deaths (King et al. 2003; Ontario Child Mortality Task Force 1997; MCYS 2005). Recommendations stemming from this review included the flow of uniform and accurate information, accountability, and the sector's ability to assess risk (King et al. 2003). Initial

public calls for improved information infrastructure date to these recommendations (Ontario Child Mortality Task Force 1997). This shifted the sector towards a greater focus on risk and compliance with standards, though mechanisms for enforcement were lacking.

A program of Child Welfare Reform was pursued between 1998 and 2000. Reforms during this period amended the legislation, reviewed agency case recording quality, implemented a case indexing information system called FastTrack, formalized a classification system for service eligibility, standardized the approach to child protection risk assessment through the Ontario Risk Assessment Model (ORAM), and encouraged agency case management computerization (MCYS 2005; Swift and Parada 2004; Trocmé, Mertins-Kirkwood, et al. 1999; OACAS 2016). The ministry review of a random selection of agency case files found that while recording standards for investigation and child abuse cases were high, recording standards for case management and administration were of concern; however, the ministry had no ongoing way to monitor or evaluate the quality of case files (King et al. 2003) and about a decade later, the provincial auditor recommended consistent ongoing file reviews (OAGO 2008). During this period, some agencies also began to implement electronic case management software for use by, first, record administrators (for meta-data entry), and then, their front-line social workers (for case recording) as software became more user friendly (Participant 1, personal communication, 28 September 2018). The ministry's FastTrack Information System allowed workers to determine whether a client had prior contact with other Children's Aid Societies (Kerr 2012; MCYS 2011), but did not include comprehensive case information. If a client was found to have records at another society, the worker would need to request those files from the agency. This limited its use for administrative oversight.

This lack of clear data was seen as partially responsible for tragic child deaths and another reason for the introduction of the first mandatory risk assessment system (King et al. 2003). The ministry at the time noted that, "[p]rior to the introduction of the *Ontario Risk*

Assessment Model (ORAM), most workers relied only on their experience and judgment to decide whether to open cases" (MCS 2003, 12). Some commentators noted that the risk focus shifted the sector from professional judgment to administrative procedures, saying that "[a]n important component of risk management demands reducing risk that front-line social workers might act in ways that are not sanctioned or approved of by administrators" (Montigny 2003, 37). However, the ministry lacked capacity for monitoring and enforcement, and compliance rates with the risk assessment timeline requirements were low (OAGO 2006). Despite this, the focus on risk was also found to have some unintended consequences on which cases were prioritized, causing workers to focus their efforts on cases where there was a risk of something going wrong, rather than on cases where something had already gone wrong (Stoddart 2017). Tightened standards and risk assessment began to build administrative incentives into the social work. The risk-based approach shifted the sector more towards erring on the side of caution and taking children into care, rather than supporting families (OAGO 2006).

The 1998 reforms resulted in a greater focus on risk and protecting children and "the pendulum swung heavily toward investigation, evidence, and legal proceeding" (Brade 2007, 15). Further, the ministry was seen to neglect the type of information needed to monitor "the extent to which such policies affect the children and families themselves, beyond the mere fact that more children are being admitted into care" (King et al. 2003, 17). Administrative data was taking precedence over client outcome measurement.

After the reforms that took place between 1998 and 2000, the ministry did an evaluation between 2002 and 2003, influenced by rising costs, as the increased focus on risk brought more children into care (King et al. 2003; MCS 2003), and the coroner's recommendations from the 2001 inquest into the death of Jordan Heikamp (OCC 2001). During the evaluation, there was another high-profile child death, of Jeffrey Baldwin, while in the care of his grandmother whose records of neglect of her own children in the 1970s had

not been found when they were needed[13] (Choate 2017; OCC 2014; R. v. Bottineau 2011). This led to another round of transformation (MCYS 2005).

Initiated in 2005, Child Welfare Transformation reforms focused on reducing the cost of service through an emphasis on prevention (MCYS 2005). Stemming from the evaluation recommendations, these reforms also included moving from a process focus to an outcomes focused approach to accountability, improving information management, and establishing consistent standards for work. To focus on outcomes, the ministry mandated the Looking After Children instrument[14] to assess the development of children in care (Miller, Vincent, and Flynn 2017). The ministry also committed to report on performance measures related to permanency, safety, alternative dispute resolution, and client complaints (Ontario 2006). Between 2006 and 2008 and in partnership with the OACAS, the ministry initiated a Single Information System pilot in three agencies[15], using Cúram case management software (Simcoe County Children's Aid Society 2008; Ontario 2006; Lombardi 2008).

The ministry also launched the Child Protection Standards in 2007, which provided a mandatory written framework that was intended to promote consistent high quality service delivery to children, youth and their families by setting out workflows and timelines (MCYS 2007a). While the standards included tools to measure strengths and needs and a Differential Response Model to allow workers to take a customized approach to low-risk cases (MCYS 2007a), they remained primarily risk focused (MCYS 2007b). The standards also broke up the service into distinct phases (e.g., intake, investigation, ongoing, child in care, placement) and described the activities that were required during each of those phases (MCYS 2007a). Decisions about whether or not to structure the work with specialists in each

[13] Though the recommendations from the coroner's inquest would not be published and actionable until 2014 (OCC 2014).
[14] Known as the Ontario Looking After Children project (OnLAC) operated out of the University of Ottawa.
[15] Timiskaming Child and Family Services, Renfrew Family and Children's Services, and Simcoe Children's Aid Society

phase (and transfers between workers) or with a single worker for each case was left up to the individual agencies (MCYS 2007a). The piloting of a new integrated information system and the launch of the standards may have been in response to an auditor general criticism that “the current multiple information systems do not provide province-wide standardized information” (OAGO 2006, 56) and their continued findings that the Ministry could not monitor compliance with risk assessment requirements to determine if children were being appropriately and consistently assessed (OAGO 2008).

The key changes to reduce costs were the Differential Response Model that relaxed the approach for low-risk cases, permanency planning to support more children in permanent placements outside of expensive residential care, alternatives to court through alternative dispute resolution to reduce court costs, and a revised funding model that provided funding not just based on historical funding levels, but on service volumes (MCYS 2005). At the time, “the pendulum appears to have swung in the other direction again in Ontario … prevention has once more received emphasis in legislation and practice” (Brade 2007, 15). However, prevention appeared to be more about preventing children from coming into care, not by supporting families, but by diverting children from expensive services.

Subsequent to this transformation, further issues began to emerge. The attempts to focus on outcomes were not realized, an effective information management strategy that would allow for the integration of monitoring and performance was not implemented, and cost reductions underperformed expectations. The first attempt at a province-wide case management system (the Single Information System) was only implemented in three CASs, so the ministry was unable to publicly report on any of its intended performance measures related to safety, well-being, and, permanence except for completed adoptions (Ontario 2006; 2007; 2008; 2009; 2010). Further, the most easily measured service volumes at the time were out-of-home services, arguably, some of the most expensive services (CPSCW 2012). The data that was available created perverse incentives to place children in the most

expensive care settings. While the rate of cost growth declined, there was little progress in the way of monitoring, accountability, absolute cost growth, and the development of an information infrastructure that could support the transformation objectives. There was a neglect of the underlying information infrastructure.

In 2009, the ministry established the Commission to Promote Sustainable Child Welfare to evaluate the service sector and make recommendations in an attempt to further control the cost of child welfare (CPSCW 2012). This evaluation occurred between 2009 and 2012, and led to a period of reform that aimed to evaluate the 2005 transformation, respond to concerns about child welfare management and service delivery, assess the funding envelope, control costs, sort out information about the sector, revise standards, and identify if outcomes were improving (CPSCW 2012).

The research period: 2010s to 2020

During the research period, there were a number of different, but related activities in Ontario's child protection sector. The Commission to Promote Sustainable Child Welfare released its recommendations, and in response the ministry changed its funding model, revised its standards, revisited the act, improved performance reporting, and implemented CPIN, which was intended to provide a single province-wide case management system to support front-line service and provincial government oversight.

In 2012, The Commission made recommendations related to the structure of the sector, the funding model, accountability, and service delivery. They recommended rationalizing the number of agencies in the sector, adding measures of need in the funding model, implementing performance indicators, and incentivizing permanent placements for children (CPSCW 2012). Recommendations appeared to be always trying to rein in immediate cost over identifying long-term solutions that lower cost and improve people's lives. The Commission also made recommendations about addressing administrative burden, indicating that "a number of CASs cited as significant cost drivers the additional

regulations, Standards and Directives introduced between November 2006 and 2009" (CPSCW 2010, 5). One CAS staff member said that "[o]ver the past 3 years there have been more than 30 new Directives and 200 changes to current standards have been introduced. Worker/client contact time continues to erode as more and more unreasonable expectations are introduced" (CPSCW 2010, 4). While the sector may have shifted back towards family support, the focus remained administrative, emphasizing procedures and the associated documentation rather than direct service and clinical judgement. Further, the evidence base for the standards were coming under question: even if agencies were 100% compliant, there was no guarantee of positive outcomes in service provision (Lemay 2011).

In response to the Commission's recommendations, the funding model was changed to abandon historical allocations and focus on demographic need in addition to service volumes, including children moving to permanency (OAGO 2015a). It also implemented balanced budget agreements to try and control costs (Government of Ontario 2015). The ministry also sought to revise the standards (initiated in 2013 and finalized in 2016) and the act (with the review commenced in 2010 and the act finally proclaimed in 2017) to streamline rules and reduce administrative burden, while continuing to ensure the safety, permanency and well-being of children (MCYS 2016a; 2016b; Ontario 2017; MCYS 2010; OAGO 2015a). In the midst of all these changes, the ministry began implementing CPIN. CPIN replaced the different information systems that agencies across the province had independently developed or commissioned. It was intended to address prior concerns about inadequate monitoring of the service sector by the ministry and inadequate access to and sharing of records by service providers (MCYS 2016c; OAGO 2015a).

In terms of the standards and legislation, the standards were streamlined and made more clear, but also more flexible (MCYS 2016a; 2016b). The *Child, Youth and Family Services Act* increased the age of protection and set out a new framework for the collection, use, and disclosure of personal information (Ontario 2017). The act also allowed the ministry

to issue enforceable directives, one of which was about collecting identity-based data in response to criticisms about disproportionality in child welfare, necessitating ad hoc changes to CPIN to accommodate the new fields, whilst duplicating existing fields (Contenta, Monsebraaten, and Rankin 2016; OHRC 2018; MCYS 2018; OACAS 2018).

At around the same time, the OACAS and the ministry began to work with the Ontario Child Abuse and Neglect Data System (OCANDS) in the Faculty of Social Work at the University of Toronto on measuring performance indicators. OCANDS had been gathering agency data under voluntary agreements since 2007 in order to build a longitudinal database, clean the data, and provide those agencies with relevant insights (Fallon et al. 2017). This partnership was intended to allow the ministry to report on the Commission's recommended 24 service performance indicators, which were aligned with the key dimensions of safety, permanence, and wellbeing identified in the National Outcomes Matrix (Trocmé, Nutter, et al. 1999; Trocmé et al. 2009), as well as measures of agency management (Fallon et al. 2017). At the time, the ministry was unable to clean and process this data into the performance indicators on its own despite having back-end access to the underlying data in CPIN.

With the assistance of OCANDS data and starting in 2015, approximately 5 years after the partnership was formed, the ministry was able to provide public reporting of 5 service performance indicators under the three key areas of safety, permanency, and well-being for the fiscal years between 2010-11 and 2020 (MCYS 2017; MCCSS 2020a), though not all performance indicators could be replicated during the transition year from a legacy system to CPIN due to difficulties bridging data between the systems (Fallon and Black 2017). One of the reasons for this was that linking numbers were not effectively included in the new information system (Participant 47, personal communication, 23 January 2020). Two decades after the first recommendations were made related to the flow of information from the sector to the ministry, the ministry was able to report on some measures of

performance, though it was dependent on data aggregated and prepared by OCANDS for 3 of the 5 measures and many of the indicators were more related to outputs (recurrence, days in care, days to placement) than outcomes (rating of child caregiver relationship) (Fallon et al. 2017; MCCSS 2020a). This indicated that the ministry itself did not have the relevant information necessary to oversee the service sector and needed an independent voluntarily created research database at a university to achieve its objectives. Since the 2015 audits of child welfare services by the Auditor General of Ontario, another monitoring tool, the quality improvement plan, demanded that agencies evaluate compliance with government policy with the unintended consequence of creating competition between agencies on compliance with standards (Peel CAS 2017). Agencies reported on quality improvement plan data, based on the indicators requested by the Auditor (OAGO 2015b; The Children's Aid Society of Ottawa 2017).

Over the sector's history, changes intended to control cost either failed or reduced the focus on child safety, and subsequent tragic child deaths shifted the sector back towards child safety in what has been described as the pendulum swinging. Over the course of these shifts, the sector saw increased formalization through risk assessments, standards, directives, and regulation. With formalization, there was a shift from clinical work and professional judgement to compliance with standards and a growing interest in measurement. Over the history of the service sector reforms, the ministry had developed interests in having quality data to feed its funding model, ensure compliance with standards, and publicly report on particular performance indicators. The legacy of these changes in rules and roles shaped the records that were prioritized and the context for information systems in which the centralized CPIN system was designed, developed, and implemented.

4.1.2. Brief history of child protection in England from inception to 2020

Similar to the Ontario case, it is important to note some of the key historical developments in England's child protection sector that preceded the digital changes. This

provides some indication of what knowledge, priorities, and values have been at play throughout the life of the service sector. As with Ontario's history, England's child protection sector also experienced the swinging pendulum, the progress of informatization and government oversight, and the rationalization of the sector from professional judgement to administrative compliance with standards.

Early days and establishment of the modern service system: 1889-1989

Early child protection in England centred on the prevention of cruelty to children and the transfer of parental rights to individuals or organizations (like local authorities) (Batty 2005; Butler and Drakeford 2005; Parker 2010; Bullock and Parker 2017; Swain 2021). Subsequently, there were a range of legislative changes between 1889 and 1989 that reinforced jurisdictional silos and divides between departments and orders of government, were made in response to tragic child deaths, led to professionalization and later proceduralization of service provision, and began to introduce ever greater informatization at the front line and for management (Seebohm 1968; Weyts, Morpeth, and Bullock 2000; Batty 2005; Munro 2005; Hall et al. 2010; Parker 2010; Dickens 2011). Over this period, there was also a swinging of the pendulum between prevention and child protection (James 1998; Butler and Drakeford 2005; Bullock and Parker 2017; Grover 2020). Worthy of note were changes in inspection (Bullock and Parker 2017; Dickens 2011), interest in data (Prentice 2016; Bullock and Parker 2017), calls for technologies to assist practitioners (Weyts, Morpeth, and Bullock 2000), and the legislative formation of the modern service system with the *Children Act* in 1989 (James 1998; Parker 2010; HM Government 1989).

The Department of Health, which oversaw the service sector at the time, had three key areas of interest: technology, data and legislation. In the 1980s, one of the Department's concerns was "[t]he lack of vision about the need for technologies and devices, such as analytic tools and predictive models validated by research that practitioners can use" (Weyts, Morpeth, and Bullock 2000, 216). But research on technologies for practitioners was not

pursued at the time. In terms of data, there was the introduction of the child at risk register (later the child protection register) (Prentice 2016), then unit returns in 1977, outcome studies in the 1980s, and the looking after children materials in 1985 (Bullock and Parker 2017). A wider understanding of prevention led the 1989 *Act* to address concerns related to both child protection and child welfare (including contact with family and reunification) (James 1998). It also set thresholds for receiving services and introduced section 17, which established the idea of 'children in need' in addition to the category of children at risk of harm from abuse, neglect, or cruelty (HM Government 1989; Weyts, Morpeth, and Bullock 2000). The act also represented an opportunity to consolidate a 'hodge podge' of legislation and its interpretation in the courts (Parker 2010).

Reforms between the establishment of the modern service system and the research period: 1990s to 2010

Over this period, focus continued to shift between child protection and child welfare, there was increased formalization through assessment frameworks, expansion of statistics, guidance, and efforts to introduce information technology to improve information sharing. This occurred in the context of an overarching e-government agenda (UK Cabinet Office 2000). In the early 1990s, several new child-focused assessment tools were created based on the Looking After Children project (Hall et al. 2010). Further, the Assessment and Action Records provided a means to measure outcomes and produce information that could be aggregated for management (Hall et al. 2010). During the 1990s, there was a shift from focusing on protecting children from abuse (and forensic investigation) to safeguarding and child welfare and from investigation to assessments, which called attention to a new category of children in need (Parton and Berridge 2011). In 1999, Working Together to Safeguard Children was published to provide guidance on safeguarding, joint working, and the processes to be followed during service delivery (HM Government 1999). This guidance tried to balance child protection and child welfare and connected with New Labour's efforts

to combat social exclusion (HM Government 1999; Parton and Berridge 2011). Over this period, there was also an expansion of available statistics on children looked after in the late 1980s to 1994, as well as from the child protection register (Department of Health 1999; 1998).

Between 2000 and 2010, significant public scrutiny was directed towards tragic child deaths. The torture and murder of Victoria Climbié in 2000 led to a high profile public inquiry that informed the ensuing Every Child Matters green paper and subsequent reforms (Parton and Berridge 2011; Laming 2003; HM Government 2003). The inquiry also began a trend of identifying individual error and directing blame, rather than looking at systemic problems (Munro 2005). Another tragic child death occurred in 2007 with the killing of Peter Connelly (Baby P) by his caregivers in the same local authority where Climbié had been murdered 7 years earlier (Laming 2009). Blame was attributed to individuals, some of those individuals were sacked, social worker morale declined, and it became increasingly difficult to recruit and retain staff nationally (Parton and Berridge 2011), which was a problem given that local authorities had shown worse performance where there were signs of workforce instability (R. Hood et al. 2016). Changes related to guidance, organizational structure, inspection, data, and information technology were introduced to try and help reduce the risk of such tragic events occurring again.

Key guidance changes were related to assessment, approach to service, joint working, and information sharing. In 2000, the Framework for the Assessment of Children in Need and their Families was released in an effort to reorient services towards the family, prevention, and early intervention (Department of Health, Department for Education and Employment, and Home Office 2000). The framework was focused on initial assessment and built on the foundation set by the Looking After Children materials (Wastell, White, and Broadhurst 2009; Hall et al. 2010).

Subsequent to the publication of the Laming inquiry recommendations, the Every Child Matters green paper was released. It stressed early intervention, integration between service providers, and information sharing to rationalize the system, identify if things were improving, and learn from experience (HM Government 2003). It sought to achieve these aims with a Common Assessment Framework, which built on the earlier framework, and information technology systems, such as the Integrated Children's System and ContactPoint, which were intended to improve information sharing (Department for Education and Skills (DfES), Department of Health, and Home Office 2003). There was also the issuance of revised guidance, which set targets, timescales, and standards, and brought it up to date (HM Government 2003; Parton and Berridge 2011; Broadhurst et al. 2010). In 2004, the *Children Act* was proclaimed to enable those changes (HM Government 2003; Dickens 2011). In 2006, revised Working Together to Safeguard Children guidance was released, which established Local Safeguarding Children's Boards and required local authorities to replace their child protection registers with compliant information technology systems by 2008 (HM Government 2006).

In terms of organizational structure, at the national level, there were transfers of authority from health to education in 2003 and the creation of a new Department for Children Schools and Families in 2007 (HM Government 2003; Bullock and Parker 2017; Community Care 2003). At the local level, area child protection committees were replaced by Local Safeguarding Children Boards through the *Children Act* 2004 to improve shared responsibility and joint working, and social services for children were integrated with education to form larger children's services departments (Batty 2005; HM Government 2006; Bullock and Parker 2017).

The inspection regime also changed, with the Social Service Inspectorate replaced by the National Care Standards Commission in 2002, which was later replaced by the Commission for Social Care Inspection in 2004 and then by the Care Quality Commission in

2009 (Dickens 2011). Though, by this point, Ofsted was expanded in 2007 to take on responsibility for monitoring local authority children's services departments (R. Hood, Nilsson, and Habibi 2019). Until 2009, Ofsted and the Commission for Social Care Inspection conducted Joint Area Reviews using multidisciplinary teams, after which a new framework for inspection and comprehensive area assessment was introduced (R. Hood, Nilsson, and Habibi 2019).

Data elements also changed and expanded over this period, with the most significant change being the introduction of the Child in Need census in 2000 (Quality Protects Children in Need Working Group, National Statistics, and Department of Health 2000). The child in need census was novel because it was a significant portion of social service activity and previously only Children Looked After and children on the child protection register were on central returns (Department of Health 2000b). Children in Need surveys were repeated in 2001, 2003, and 2005, and the census eventually shifted to utilize data already collected and held on electronic information systems (Gatehouse, Ward, and Holmes 2008). While it was the first attempt to collect data on children in need and collected comprehensive data on social services activity and expenditure, "it provided little quantified information on the exact type of services being received" and it took little account of aligned services, such as education, youth justice, and health (Gatehouse, Ward, and Holmes 2008, 6). In addition, the Looking After Children documentation was foundational to the development of the framework for the assessment of children in need and their families, the integrated children's system, and the common assessment framework that succeeded it (Hall et al. 2010). However, some data collection for returns or inspection became much more related to targets, timescales, and performance data on compliance.

In general, the trajectory of informatization in local authority children's social care is that while local authorities have had computers since the 1960s ("Local Authorities (Computers)" 1965), computerization in children's social care specifically has been later and

region-specific. Documentation for Looking After Children in the mid-1990s was paper-based (with later data entry into computer systems) (Gatehouse, Statham, and Ward 2004), and some social workers had to share computers with peers (Peckover, White, and Hall 2008) as computers were still not universally available to social workers by 2008 (Peckover, Hall, and White 2009). However, this period did see important information technology changes including the Integrated Children's System (ICS), e-Common Assessment Framework (eCAF), and ContactPoint, the proposed integrated enterprise child index system. These systems were all part of an Every Child Matters Information Sharing and Assessment project (White, Hall, and Peckover 2009) that would create a single record for each client (Department for Education and Skills (DfES), Department of Health, and Home Office 2003; White, Hall, and Peckover 2009) and allow local organizations to share information and work better together (Department for Education and Skills (DfES), Department of Health, and Home Office 2003). The ICS was initially a set of standards for data collection before becoming aligned with information systems (Department of Health 2000a). The ICS also included rigid workflows with tasks and timescales and specifications for compliant software implementations (White et al. 2010). This allowed decentralized information technology implementation. The goal was to have an integrated system that would provide a common language for professionals, eliminate repetitive paper form filling, and provide data for planning at the individual and strategic planning levels (Department of Health 2000a).

The Common Assessment Framework (CAF) was developed as a standard tool for use by all professionals working with children and the e-Common Assessment Framework was electronic versions of these forms (Munro 2011). It was criticized for abandoning "'[n]arrative concerns about context, character, events and process" in favour of "a common, evidence-based language of need" which created "challenging descriptive and interpretive demands for the CAF writer and reader" (White, Hall, and Peckover 2009, 1213). As part of a process of informatization, CAF was seen to transform 'knowledge' into 'information' "to

enable electronic manipulation, transfer and storage." (White, Hall, and Peckover 2009, 1213).

ContactPoint was intended to be a database of children that could support information sharing by professionals and multi-professional interventions, but this more centralized technology was never realized (DfE 2010). The decentralized approach was also showing inconsistencies. After the 2004 *Children Act*, "the range and complexity of computer systems designed to screen and identify those in need of attention has grown considerably" (Parton and Berridge 2011, 67). By 2010, the Integrated Children's System had been universally implemented (Broadhurst et al. 2010); however, some local authorities still used paper versions of the forms rather than electronic versions limiting its integration and information sharing potential (Hall et al. 2010).

In response to these information technology changes, concerns were raised about managerial audit and performance management objectives that were embedded in these information technologies taking precedence over front-line service, keeping workers at their desks on data entry and distancing them from the lived experiences of their clients (Parton and Berridge 2011; White, Hall, and Peckover 2009; Hall et al. 2010). The changes were seen as "an attempt at top-down governance of practice where the classification system does not appear to be designed with attention to situated use" (White, Hall, and Peckover 2009, 1213). Overall, the focus appeared to shift towards accountability and monitoring of practitioners and their clients (Hall et al. 2010).

Children's service staff were having to deal with changing organizational, inspectorial and informational arrangements, which had earlier been suggested as one extenuating factor in the tragic child death of Maria Colwell in 1973 (Butler and Drakeford 2005). Further, assessments built into the ICS forced workers to follow a specific set of procedures, provide information in a particular way, and demand recording be completed within rigid timescales. This heavily regulated regime created significant pressure and generated latent conditions

for error (due to workers taking shortcuts or finding workarounds) (Wastell, White, and Broadhurst 2009). There was an acceleration of informatization that formed the early foundation for the risk focus of predictive analytics tools in children's social care.

The research period: 2010s to 2020

The period in England from 2010 to 2020 was characterized by scandals, changes in organizational structure, continued changes to the inspection regime, austerity, developments in the sector's data holdings, and the introduction of new digital tools.

This period experienced political and organizational changes, as well as reform in response to scandals. In 2010, the coalition government replaced the Department for Children, Schools and Families with the Department for Education and began a period of local government austerity (Bullock and Parker 2017; Atkins 2020; Harris, Hodge, and Phillips 2019), which was continued by the post-2015 Conservative government, and which in some cases limited the ability of local authorities to retain data analysis and information technology staff (Bright et al. 2019; T. M. Vogl 2021). Scandals and reviews into child protection and child sexual exploitation led to reforms in inspection regimes and guidance as part of a 'scandal-reform' cycle that highlighted the limitations of approaches that focus on familiar risks and fail to pick up developing risks (Munro 2011; Jay 2014; R. Hood, Nilsson, and Habibi 2019). Critics suggested that "Ofsted may be inhibited in its capacity to go beyond existing performance frameworks to consider regulatory risks that are not currently being detected by agencies." (R. Hood, Nilsson, and Habibi 2019, 235). Despite the changes, there was no dramatic shift in ideology towards identifying systemic issues or how children's needs arise (Bullock and Parker 2017).

There were multiple changes to the frameworks for inspection between 2010 and 2020. This period began with a framework that was in place between 2009 to 2012 and included unannounced inspections and a focus on multi-agency working and the common assessment framework (Ofsted 2017c; R. Hood, Nilsson, and Habibi 2019). It was replaced

by the inspection of local authority child protection arrangements between 2012 and 2013, though not all areas were inspected before this framework was replaced by the single inspection framework, which was in place between 2013 and 2018 and introduced the 'Annex A' dataset[16], analysis of leadership, management, and governance, and more punitive publicly reported judgements, shifting rating terminology from 'adequate' to 'requires improvement'[17] (Ofsted 2017c; R. Hood, Nilsson, and Habibi 2019). Local authorities were adjusting information systems to accommodate Annex A reporting requirements (Munro 2014) and Annex A was the basis for some predictive analytics projects (Clayton et al. 2020). The single inspection framework was criticized for being excessively punitive and focusing on quality of effort over quality of effect, leading to professional upheaval and resulting in performance declines following inspections (iMPOWER 2015; R. Hood, Nilsson, and Habibi 2019; Wilkins and Antonopoulou 2020).

In response to these concerns, in 2016, comprehensive area assessments were replaced by Joint Targeted Area Inspections to evaluate multi-agency working (Ofsted et al. 2018). Overall, "differences in emphasis between inspection frameworks were attributable to shifts in scope and remit, or to shifts in the wider policy context, and in some cases suggested a reactive response to institutional failings exposed in public inquiries and reviews." (R. Hood, Nilsson, and Habibi 2019, 235). In 2018, Ofsted also introduced a risk-based approach to inspection called the inspecting local authority children services framework, which did not change what data was collected, but the frequency and intensity of inspections, and which was intended to make recommendations in a narrative style to make clear what improvements were needed (Schooling 2017). Focused visits, annual self-evaluations, and annual conversations were intended to identify issues earlier and quickly

[16] Annex A is contacts, early help, referrals, section 17 or 47 assessments, section 47 enguiries/conferences, CiN, child protection, children in care, care leavers, adoption, adopters, by individual and family with some demographics (Ofsted 2017a).
[17] Likely in response to local authorities with good ratings being responsible for high profile scandals, such as Baby P and child sexual exploitation (Jones 2015).

respond to address them (Schooling 2017). Many of these changes could be considered part of a continued ‘scandal-reform’ cycle (R. Hood, Nilsson, and Habibi 2019).

In terms of data, the biggest change was the introduction of Annex A data requirements from the single inspection framework (Ofsted 2017c; 2017a). However, there was also more awareness about existing data, its quality, and its limitations. Data was still largely focused on performance management and may have prevented social workers from easily understanding the complexities of a case (Dencik et al. 2019). The Ofsted data was seen to be more concerned about compliance than outcomes (Wilkins and Antonopoulou 2020). The complexity associated with understanding child protection cases and outcomes “may explain why for so long the sector has relied on measuring things that are easy to count, such as the number of assessments completed on time, rather than the things that really matter but which are harder to quantify, such as the quality of those assessments." (Wilkins and Antonopoulou 2020, 865). Further, a number of data quality issues were identified with children’s services data: “Despite the existence of detailed guidance for statutory data returns, there is often substantial variation in data recording within and across LAs [local authorities]” (Preston et al. 2021, 241). This variability was also found by those working on predictive analytics projects in the sector (Sanders et al. 2017; Clayton et al. 2020). Part of this may be due to the flexibility local authorities held in terms of picking their own information systems or because those entering the data did not have the same mental models (Preston et al. 2021), despite ostensibly having the same language through the ICS (Department of Health 2000a).

There were also issues identified with linking data, such as linking individual children to the relational dynamics of their family, to external databases that contained more robust data about supports provided, or across time, existing datasets, and local authority boundaries “because of the use of various local personal identifiers that do not persist from year to year or place to place” (Preston et al. 2021, 241). For example, there was a

separation of data about children looked after versus children in need (Preston et al. 2021). Cleaning data thus required the involvement of someone with “a detailed understanding of local case management systems” (Preston et al. 2021, 242). In addition, while gaps in children looked after and care leavers data had been closed, there remained a gap in understanding the outcomes of children in need relative to the general population, as this longitudinal data was not tracked (fieldnotes, 28 May 2020). Finally, existing data was not suitable for “understanding innovative approaches that had not been envisaged at the point the data set was designed’” (Preston et al. 2021, 243). It was difficult under these conditions to understand the outcomes of a child’s journey (Preston et al. 2021) (Participant 50, personal communication, March 19, 2020).

4.1.3. Summary and comparison of histories: Ontario and England

Over the period covered here, both jurisdictions had devolved child protection systems that evolved out of the 19th century, became more focused in the 1950s, and began modernization after the 1980s with similar changes in local and central information demands leading up to the research period. In both jurisdictions, changes had influenced what the sector chose to remember. The central government had progressively expanded its control over the sector, first through funding, but increasingly through changes to standards for service delivery and subsequently through attempts to monitor compliance with standards. The organizational memory demands of the central government had been increasing for particular types of information and behaviour, specifically those related to compliance with administrative standards, however, where guidance was open to interpretation, local information demands varied across agencies and over time.

There were other areas of comparison that showed parallels between Ontario and England. Both jurisdictions sought to promote prevention, but each made this an unfunded obligation that was ignored in practice. Both modernized their systems with the support of new legislation in the 1980s, focusing on assessment – one through risk assessment and

one through a common assessment framework. Both jurisdictions also experienced shifts between professional judgement and procedural compliance, risk and prevention, as well as child protection and family support. The swinging pendulum was associated with a scandal-reform cycle. Ontario appears to have been ahead of England in terms of digitalization, at least in some CASs, but some English local authorities appeared to be pushing the boundaries of analytics over the research period compared to activities in Ontario. There was some policy transfer as the Looking After Children materials came to Ontario at a later period, and only after England had begun to evolve beyond those materials through its Children Looked After datasets (DfE 2020). In both jurisdictions, though perhaps more so in Ontario, management data focused on agencies and there was insufficient information infrastructure to meaningfully report on client outcomes or what supports could improve them. Both produced guidance that emphasized workflows and timelines. Finally, both Ontario and England began to report on agency performance.

There were also notable divergences that motivated the comparison. England was reluctant to establish a national linked database or index of children receiving service, with the abandonment of ContactPoint in 2010 (DfE 2010), whereas Ontario had already established such an index from the late 1990s (MCYS 2005). On the other hand, England appeared to have a much higher degree of transparency about its service sector, publishing data from the 1970s (DHSS 1976), while in Ontario similar data was not publicly available through its open data catalogue in 2020 (Ontario 2016c; 2016a; 2016b). This difference in acceptance of child databases may have been related to the degree of transparency and the extent to which the public was aware of government's holdings of child-level data.

This historical background and comparison of the two jurisdictions not only sets the foundation for the information technology changes discussed in the next section, but also for the findings in the substantive chapters. With this context, this chapter will now turn to the contextual details surrounding the development and implementation of digital technologies

over the research period, specifically, CPIN in Ontario, and the technological changes surrounding predictive analytics projects in England.

4.2. Context setting for technology and memory in Ontario and England

This section aims to describe the digital changes implemented over the course of the research period in the child protection sectors in Ontario and England to help inform the discussions of organizational memory in the substantive chapters. This section begins with a discussion of CPIN in Ontario, followed by a discussion of the ongoing transition between independent case management systems and the adoption of new predictive analytics and other analytics technologies in England.

4.2.1. Background to the implementation of CPIN in Ontario: 2010-2020

This section sets out the context for the development and implementation of CPIN in Ontario, starting with the government and organizational contexts before describing the information technology change. In the Canadian case, it is important to note that the focus is on a provincial government because under the *Constitution Act, 1867*, child protection is an exclusive power of provincial legislatures. Canada is a federal parliamentary democracy consisting of ten provinces and three territories. Each province has its own legislature with constitutionally protected powers to exercise sole regulatory and administrative authority in certain policy areas. In Canada, child protection services are regulated and delivered at the provincial level (CWRP 2019). National government has limited influence (PHAC 2019). Service systems differ from one province to the other. At the time of the study, each province in Canada operated its own child protection system and digital transformation was pursued at the provincial level (CWRP 2019).

In the province of Ontario there were 50 Children's Aid Societies (CAS) and Indigenous Child and Family Wellbeing Agencies that delivered child protection services[18] (MCCSS 2020a). These were independent not-for-profit organizations with their own boards of directors that delivered services within a specific region or to a specific population as regulated by provincial government (MCCSS 2020a). In all other provinces, the provincial government delivered these services (Trocmé et al. 2019), making Ontario the most similar administratively structured province to England, insofar as independent local organizations are responsible for delivering the service. CASs have geographic areas of service provision, except that in certain geographic areas there are more than one society because some societies serve distinct populations (e.g., Catholic, Jewish, urban Indigenous, First Nations). CASs are overseen and advocated for by the Ontario Association of Children's Aid Societies (OACAS) and the Association for Native Child and Family Services Agencies of Ontario. The societies are funded and regulated by the Ontario Ministry of Children, Community and Social Services (hereafter referred to as the ministry). During the research, the ministry had a structure with regional offices that oversaw multiple Children's Aid Societies within defined geographic regions.

Prior to CPIN, each agency had its own independent information system that was customized to meet its local needs, but these information systems were not connected. As a result, client records were not easily accessible between agencies. Previously, if another agency wanted records, because a family had moved or for a background check, they would need to contact other agencies in the province and ask them to search their records. Those records would later be faxed over. Unlike in health care (Randell 2010), many child welfare clients tend to be transient, moving from one region to another, meaning that relevant records were held across multiple agencies. This not only made the work of acquiring and

[18] The number of CASs is subject to change depending on amalgamations and the creation of Indigenous Child and Family Wellbeing Agencies undertaken by the Ontario Ministry of Children, Community and Social Services.

analyzing case history time consuming and onerous, but it was seen as one extenuating factor in the high profile child death of Jeffrey Baldwin, though the primary issue in the Baldwin case was a missed internal record (OCC 2016; 2001).

Ontario had six types of independent legacy information systems, and each one had its own logic, tailored to the particular practices and interpretations of the agencies that used it, customized so that even the same base software could differ between agencies[19] (Participant 32, personal communication, 15 May 2019). In different agencies, different data elements were collected, the same data elements were collected differently, and roles may have been structured either in a compartmentalized way (where different workers would take on different tasks) or in an integrated way (where a single worker would take a client through all of the different tasks). The ways that records were collected, consolidated, stored, and maintained thus differed across agencies. In many cases, information was split across current information systems and legacy systems that contained information that was not, or could not be, migrated to CPIN. This fragmentation of historical information across information systems posed a risk of missing critical case information.

After a period of development starting in 2010, and led centrally by the ministry in partnership with its I&IT cluster, agencies were gradually transitioned in a series of groups from their legacy information systems to CPIN (OAGO 2017a). The province implemented the CPIN enterprise case management system across all non-indigenous agencies between 2014 and 2019. This was originally planned to be completed in 2015, but implementation did not begin until 2014. The project was extended to 2020 in 2015 and it was finally fully implemented across all non-Indigenous agencies in 2019 (OAGO 2017a). CPIN was implemented, with 3 agencies adopting it in 2014, 2 agencies in 2015, and 10 in 2016

[19] The information systems included Matrix (by Vertical Software International Inc.), Single Information System (by Cúram on IBM xSeries hardware integrated with Oracle Finance), AS/400 (by IBM, which could support Lotus Notes), the Child Welfare Information System with eForms (by Coyote Software Corporation), Frontline (by Penlieu Consultants Inc.), and Caselook/FastTrack Information System (by Cúram).

(Fallon and Black 2017), and with the remainder joining in the following years (OACAS 2020).

The objective of CPIN was to enable data sharing between agencies across the province to support service-level decisions, simplify administrative processes, and facilitate oversight through timely, accurate, and comparable service and expenditure data (MCYS 2016a; OAGO 2015a). While the original implementation plan was developed internally within the Ministry without engaging sector stakeholders (OAGO 2015a), during later development and implementation, users were engaged, user acceptance testing was completed, and training was provided and built into agency onboarding processes (Participants 5, 6, 7, and 8, personal communication, 25 September 2018; Participant 36, personal communication, 17 October 2019; Participant 39, personal communication, 4 November 2019). In 2021, there were over 7,600 full-time equivalent staff in Ontario's child protection sector that had at least some interaction with CPIN (OACAS 2021), and 78 staff in the Ministry that worked with CPIN or on related information technology (IT) in the child protection sector (Government of Ontario 2021). The CPIN software package included IBM Cúram for case management, IBM Cognos for reporting, Oracle finance for accounting, and OpenText for attachment management. CPIN was intended to provide a back-end for the ministry that could improve oversight with real-time and comparable service and expenditure data (MCYS 2016a; OAGO 2015a). This centrally managed software solution was expected to replace the previous 6 types of independent systems that existed across the province, ensure records could be accessed across agencies, and harmonize documentation practices across the sector.

In 2011, Cúram was purchased by IBM (Kerr 2012). This not only changed the relationship between the vendor and the ministry in the early stages of system development, but it expanded IBM's influence over IT contracts with the ministry, as Cúram was also the solution selected for social assistance payments (OAGO 2017b). Some IT professionals

working in the sector believed that the procurement process was designed to favour specific bidders: “the writing was on the wall when the RFP [request for proposal] came out that, we all know that solution is gonna be Cúram on top of an Oracle stack with IBM middleware. This was even before IBM bought Cúram” and this was because, “that’s what government’s back-end technology was all built on over the previous 10 or 15 years. It’s completely understandable why they would want to continue utilizing that technology” (Participant 25, personal communication, 5 March 2019). Existing infrastructure and legacy equipment can embed historical decisions and influence the types of digital memory that are possible in an organization.

With CPIN, the ministry was responsible for any changes that needed to be made to the information system, rather than previously, when CASs would negotiate changes with their vendors. Under these new arrangements, agencies needed to submit requests to the ministry and they would be combined and queued with the requests from other CASs. In addition, while the ministry housed the data on its servers, it did not take ownership for the data, that was the responsibility of the societies.

Both the ministry and the Auditor General of Ontario stated the aspirations for this information system in the early stages of its roll out. The ministry indicated that, through CPIN,

> *[i]nformation to make the best decisions for each child will now be easily accessible to children’s aid societies. They will be able to track what protection services children have received and the results, regardless of where in Ontario services were provided. The network will support timely and efficient service for kids in need of protection and their families. (MCYS 2016a)*

The Auditor General shared and expanded upon this opinion, stating that “[t]hrough CPIN, the Ministry aims to enable timely sharing of critical child protection information among Societies, simplify administrative processes, and facilitate oversight through more timely, accurate and comparable service and expenditure data” (OAGO 2015a, 145). We will see that not all of these objectives were achieved as intended.

4.2.2. Background to the digital change in England: 2010-2020

The context of digital change in England was that local authority case management system development was an ongoing process to enable information technology systems to support new data requirements, such as the Annex A dataset and novel analytics projects using machine learning. There were efforts to conduct analytics in both dashboards and some alternative formats, but these were attracting less attention in this period than the emergence of predictive analytics for use in assessing the risk at the point of referral or when trying to determine if a case might escalate and more efficiently allocating resources.

Before discussing the digital change, it is important to describe the local authority context during the research period. There were 152 local authorities in England responsible for the delivery of child protection services (Cromarty 2019). Child protection services were regulated by the central government's Department for Education (DfE) and their performance was evaluated by Ofsted (the Office for Standards in Education) (Ofsted 2019; NSPCC 2020). They were required to provide both regular and ad hoc statistical returns, for example about children in need and children looked after (DfE 2019; 2020). Decision making was otherwise decentralized to the local authorities so that they could make local decisions about service and administration, including about which information systems to use (Parton and Berridge 2011). Some local authorities had created multi-agency safeguarding hubs (MASH) to deliver integrated services (UK Home Office 2014). Others took a more traditional departmental approach, where services were delivered or commissioned through the child protection unit of the department for children's social care within the local authority (Easton et al. 2012).

Many local authorities were undertaking digital change related to the development of case management systems to replace aging information technology in their children's social care sectors (Symons 2016) and to enable new workflows and data pulls (fieldnotes 9 July 2019). Some were exploring a variety of different data analytics techniques (Holmes 2019; T.

M. Vogl 2020b), and, of these, some began to explore the use of predictive analytics to identify risk and support decision making (Redden, Dencik, and Warne 2020). Organizations such as Nesta, the Behavioural Insights Team (BIT), universities, and corporate vendors received funding from central government or from local authorities to pursue innovative projects around data analytics, such as predictive analytics, modeling, and trend analysis (Symons 2016; Sanders et al. 2017; Clayton et al. 2020; Mikhaylov, Campion, and Esteve 2018; Ministry of Housing, Communities & Local Government 2018; T. M. Vogl 2022).

A representative from Ofsted indicated that, in terms of information systems, local authorities had migrated between systems 4-5 times since ICS was introduced, either because of adversarial relationships with vendors, information systems being money sinkholes, or the systems not being sufficiently flexible (fieldnotes, 28 May 2020). Further, local authorities were still finding it difficult to run reports to DfE, and central government was reluctant to lead and harmonize because of a separation of responsibility for regulation, monitoring, and funding and a lack of coordination from administrators around data systems for social workers (fieldnotes, 28 May 2020). In addition, data collection was based on a model from 20 years prior, and definitions of some constructs (like 'early help') were unclear, allowing for inconsistencies across local authorities (fieldnotes, 28 May 2020). Stronger local authorities with more capacity were better able to take advantage of their information systems and carry out basic, but effective, analysis (fieldnotes, 28 May 2020). In general, agencies were updating their information systems to more easily capture relevant data and align workflow with practice (fieldnotes 9 July 2019) (Ofsted 2018). Local authority staff mentioned the issue of a large number of separate, and often outdated, information systems with no unique identifiers that made accessing data for analysis very difficult (personal communication, 3rd quarter 2018). One local authority staff member said that, “[w]e were getting increasingly frustrated that we thought there was value in the data, but we couldn’t make people understand that value, because they can’t physically see the information,

because it's all hidden in these systems" (personal communication, 3rd quarter 2018). Information systems were being changed to meet shifting reporting, workflow, and analytics needs.

Local authorities were also exploring analytics tools. The Children's services Analysis Tool (ChAT) used child-level data from Ofsted's Annex A data and the last five years of published statistics for Children in Need, Children Looked After, and Adoptions, to provide an aggregated analysis for the Local Authority as well as comparisons with its statistical neighbours and the England averages (Holmes 2019). This tool, "was developed as a part of the collaborative 'Data to Intelligence' project between Waltham Forest Council, Hackney Council, and Ofsted and has been made available to all local authorities as a free resource" (Holmes 2019, 3). The Local Authority Interactive Tool (LAIT) "is an on-line tool developed by the Department for Education that features comparable information at national, regional and statistical neighbours' level, so that local authorities can assess their performance against national and regional trends" (Holmes 2019, 3). It was focused on performance and included data from mandatory returns such as the SSDA 903 (children looked after) and the Child in Need Census, but it was not updated in real time, only annually (Holmes 2019). While ChAT and LAIT are very similar in terms of data, ChAT provides a dashboard (Holmes 2019).

Local authorities were also exploring alternative analytics tools to support front-line workers. Manchester developed an integrated database with an interactive front-end that workers could use to visualize a family, the connections between its members, and its members' interactions with services over time (Henry 2016). The use of genograms in social work practice could be significantly enhanced by new digital technologies to put complex information in a visual form that could help social workers to understand the social and relational components of their cases (Pope and Lee 2015). This type of tool translates the

informational knowledge from an administrative database into a form that presents sufficient context to support direct client service provision. (T. M. Vogl 2020b; Wastell and White 2014)

Finally, local authorities began to explore the use of predictive analytics using machine learning in children's social care. Specifically, there were efforts to better determine risk at the point of contact or to identify risk of service escalation at assessment (Clayton, Gibbons, and Sanders 2019). However, many of these projects, especially those by private vendors, were not seen as transparent (T. M. Vogl 2022). In general, where local authorities were working with non-departmental public bodies, social purpose companies, or universities, there was a higher level of transparency around the models and variables used (T. M. Vogl 2022). The Behavioural Insights Team used a combination of structured administrative data and natural language processing of worker case notes, using structural topic modelling, as part of a machine learning algorithm (Sanders et al. 2017), whereas the University of Essex relied solely on a set of variables derived from administrative data, applying Lasso and Random Forests methods within R (Sena et al. 2019). What Works for Children's Social Care had the greatest level of transparency, setting out their independent and dependent variables, model specifications, and indicating that all code would be published under a copy-left license on GitHub at the end of the project (Clayton, Gibbons, and Sanders 2019). Where local authorities were working with private companies, less information about the models and variables was available (Celia 2016). The same lack of transparency was present relative to local authorities where they conducted their own risk modeling, but relied on private software for their modeling tools (T. M. Vogl 2022). In some cases, government and vendors justified this lack of transparency on the basis of commercial sensitivity (Dencik et al. 2018). In those cases where information was available, three different types of model were found to be most in use in the sector: random forest, logistic regression, and gradient boosting.

Given the expanding use, but lack of transparency, What Works for Children's Social Care sought to evaluate the technical quality of predictive analytics in children's social care, but found that it was not good in an English context (Clayton et al. 2020; Turner 2020). Part of this failure of predictive analytics in children's social care could be due to the variability of the data, the inability to link it across data sets to follow a child's journey (Participant 50, personal communication, March 19, 2020), or insufficient data within an individual local authority (fieldnotes 12 May 2021). Further, there were fewer mature categories in children's social care, unlike health with thousands of procedure codes, and some were looking at text mining as an alternative source of more meaningful data (personal communication, 3rd quarter 2018). In general, this raised "serious questions about the quality of the data and the "kind" of data that is available for the systems in question." (Redden, Dencik, and Warne 2020, 519). In this light, "predictive analytics might just be a little blip, if we can't sort out all the data underneath it." (personal communication, 3rd quarter 2018). Predictive analytics appears to demand a very particular memory infrastructure to function as expected.

4.3. Concluding statement

This chapter on the background history and context for information technology change provided an overview of the cases and is intended to enrich the understanding of some of the examples presented in the substantive chapters. There are both obvious and subtle links between the different forms of organizational memory, decisions that were made in the past, and the features of technological change in each jurisdiction. The remainder of this thesis will explore traditional understandings of organizational memory, their limitations, the advantages of expanding our understanding to incorporate new forms, and how this can help to resolve puzzles about remembering and forgetting.

Part I: Explicit and tacit memory

This part looks at examples of information technology in the child protection sectors of Ontario and England and what they reveal about the traditional perspectives on organizational memory. In each chapter, the examples illustrate how these forms of memory are instantiated in a child protection setting and the limitation of their explanatory power relative to certain memory-related phenomena, often identified through breakdown, anxiety, and the unintended consequences of information technology change.

The first chapter in this part (chapter 5) looks at static explicit memory in relation to technological change. It explores how memory is embedded in rules, roles, and records. Specific examples include how rules can be encoded in the Child Protection Information Network (CPIN) and how this leads to inflexibility and an inability to adapt, requiring destabilizing rule changes. The chapter also includes how static roles can lead to service compartmentalization in CPIN and fragmentation of memory between roles. Finally, this chapter also includes examples illustrating how the reliability of records depends on how they are migrated and how they are interpreted. The chapter then discusses how these limitations suggest other more dynamic and tacit forms of memory.

The second chapter in this part (chapter 6) looks at dynamic explicit memory. It explores how organizations remember through inter-agential communication. Specific examples include the ways in which technology enhances dynamic memory and how intersubjective communication helps to resolve some of the limitations around search and interpretation of static memory. It then illustrates the limitations of this perspective with

examples. Specific examples include how narrative understanding of cases was secondary to the static administrative data required for compliance monitoring. The chapter also explores how different dynamic interpretations of integration led to divergences between identified problems and implemented solutions. Finally, it also includes an example of how fiascos, such as high-profile child deaths, can be the subject of divergent dynamic memories about accountability based on the perspective taken and what is remembered as a result. The chapter then discusses how these limitations suggest forms of memory operating in the background.

The third and final chapter in this part (chapter 7) looks at tacit memory. It explores how memory can also be understood as conceptual frameworks operating in the background that help us to make sense of our representations of experience. It analyzes three types of background memory phenomena, conceptual frameworks, tool use, and skillful performance, in an effort to determine if there is one background memory phenomenon or three. Specifically, examples include how conceptual frameworks inform how workers process information related to their cases, how technology can repunctuate and make available for interpretation features of that tacit memory, and how these conceptual frameworks differ between different groups (like social workers, administrators, or information system designers). The chapter also includes examples of how embodied tool use fades into the background behind an objective, like finding relevant connections between people and service involvement, is learned by doing, and can break down when functionality misaligns with worker expectations. Finally, examples also include the practical performance of skilled social work, its relationship to identity, and the conflicts that emerge when motivations from different worlds (like client service or administrative compliance) come into conflict. The chapter then discusses how memory in tool use and skillful performance may be more related to the ideas of equipment and being-in-the-world grounded in fundamental ontology,

narrowing the scope of tacit memory to conceptual frameworks, thus concluding this part and pointing to the next.

Chapter 5: Static explicit memory

This chapter presents static explicit memory and illustrates what it is in the context of child protection services in Ontario and England. It begins with a definition and puts the phenomenon in terms of rules, roles, and records. It shows why this type of memory is relevant, but also why it is limited as a way of understanding organizational memory as a whole. Understanding these strengths and limitations is of crucial importance in an administrative era where, to an ever greater extent, public institutions are exploring the use of algorithmic machines that feed on this particular type of memory.

5.1. Definition of static explicit memory

As described in the literature review, the static perspective focuses on documents and files, including records and institutional components (like standard operating procedures or planning documents). Its material instantiations are in rules, roles, and records (Stein and Zwass 1995; Walsh and Ungson 1991) and it depends on a belief in memory as reproduction, where memory is an uncomplicated and unchanging copy of a past phenomenon, with historical metaphors of inscription, computation, information processing, and storage in a repository (K. Danziger 2008; Draaisma 2000). In this way, this form of memory is static and explicit.

In the public administration literature, static, or formal institutional, memory has been defined as, “static repositories of summative documents holding a singular ‘objective’ memory” (Corbett et al. 2020, 2). This perspective on memory represents “a rather mechanistic view of memory that suggests that it is something encoded into the formal

components of an organization through, for example, standard operating procedures, constitutional documents, archives or information technology" (Stark and Head 2019, 1523–24). From an information systems perspective, static explicit memory is something that can be represented within the content of an information system and that focuses on mechanisms for retention, typically in facts, rules, and structures that shape roles, as well as processes involved in getting from collection to retrieval (Stein and Zwass 1995; Walsh and Ungson 1991).

5.2. The relevance of static explicit memory

This section highlights the ways in which static explicit memory manifests in English and Ontarian child protection settings. Examples of static explicit memory include legislation, regulation, standards, and policies setting out the parameters and procedures for carrying out the work; rules for recording and information retrieval hard coded into information systems; structured workflows and compartmentalized roles with specific spheres of responsibility and actions structured by rules; and both physical and digital records with case notes, service data, data about compliance with regulatory requirements, and the adequacy or performance of service. For a comparison of these static explicit types of memory across the two jurisdictions, see table 6.

Table 6: Comparison of static explicit memory mechanisms in Ontario and England

Memory Mechanisms	Ontario	England
Rules	Child, Youth and Family Services Act, child protection standards	Children's Act, regulations, guidance
Roles	Compartmentalized services built into IT systems	Standard workflows built into IT systems
	Professional codes	Professional codes
	Job descriptions	Job descriptions
Records	Service-level data: Structured case and person data, contact logs, legacy files, attachments	Service-level data: Structured case and person data, case notes, legacy files, attachments
	Central monitoring data: Budget Package (internal), Crown Ward Reviews (internal), Key Performance Indicators (partially publicly available), (outputs focus)	Central monitoring data: Statutory Returns – Children in Need Census (CIN), Children Looked After SSDA903 (publicly accessible), (outputs and outcomes focus)
	Audit/inspection data: Quality Improvement Plan statistics, as requested by the Auditor General of Ontario (partially publicly available), (compliance focus)	Audit/inspection data: Ofsted inspection data – Annex A (publicly accessible), (compliance and service quality focus)
	System issue data: Serious Occurrence Reports (internal)	System issue data: Serious case reviews (publicly accessible)
	Child death statistics: Coroner's reports (publicly accessible)	Child death statistics: Child Death Overview Panel (publicly accessible)
	External research data: Ontario Looking After Children (OnLAC), Ontario Child Abuse and Neglect Data System (OCANDS), Ontario Incidence Study	External research data: [local and central governments hold the data]

Based on the examples in this table, this type of memory is of real importance for child safety, organizing, quantification, and rationalization. Static explicit memory is made up of rules, roles, and records that persist through time. The rules are in legislation, standards, and code, and structure how activity in the sector ought to proceed. Compliance expectations, service compartmentalization, process mapping, and professional codes

structure roles and who is responsible for what in the setting, and records constitute all the facts, history, and data that can be drawn upon to inform decision making. However, just because this type of memory remains static over time does not mean that it is not part of a process that includes change. In both Ontario and England, laws change, new roles are introduced, and old ones are changed or abandoned, and new ways of recording information are introduced, while others fall away. The key is that each instance of this memory remains static and any versions that are superseded enter an archive. Take for example the acts in Ontario and England, one can search previous versions and follow legislative change (HM Government 1989; Government of Ontario 2017). The same is true for some data sets where data is released annually, giving a snapshot (DfE 2017; 2021b), or how social workers review old case notes to understand client progress (Turner 2020). One can even find old job descriptions or professional codes to see what roles were static at a particular moment in time. Static memories are things we can find that represent some state within a changing process at a particular moment in time.

In terms of the instantiations of these forms of static explicit memory, in both Ontario and England during the research period, there were standards for the provision of child protection services. While they differed in their details, they broadly aligned on rules about steps to follow, activities to complete, and timescales for those activities (HM Government 1989; MCYS 2016b). In both jurisdictions, the type of data collected was broadly similar. There were some differences in terms of details (e.g., section 47 enquiries – multi-agency assessments), but all of the data elements were aiming at the same phenomena (e.g., how many cases of each type, durations, placement types). The main difference was transparency. While the UK was comparatively more publicly transparent about its data holdings, with more open data, I had to uncover or request information about Ontario's data holdings and, when the research was initiated, similar data to what was accessible in the UK was not accessible through Ontario's open data portal (Ontario 2016a; 2016c). In the UK,

there was more linked data across health, education, justice, immigration, employment, housing; including outcomes data (like about how care leavers are doing), and there was also more granularity in terms of breakdowns by demographic data (DfE 2021b; 2021a). In the UK statutory returns, there were also more measures of factors identified for intervention (though the Ontario Eligibility Spectrum codes and risk assessment scores combined with worker case notes could probably have delivered similar data (OACAS 2016; MCYS 2016c)). Static explicit memory in Ontario was available, but not accessible. A useful conceptual distinction in the context of static explicit memory from research on individual memory is between availability, or what memory is stored, and accessibility, or what memory can actually be retrieved for use (Tulving and Pearlstone 1966). The statistical infrastructure in Ontario was not present to enable linking and regular open public access, as was possible in the UK, and as a result, this data was not readily accessible for scrutiny by Ontario public managers (Participant 48, personal communication, 19 February 2020).

Static explicit memory is often raised as being crucial to effective child protection decision-making. The Laming inquiry noted that, “[i]mprovements to the way information is exchanged within and between agencies are imperative if children are to be adequately safeguarded.” (Laming 2003, 9). With respect to the findings that Jeffrey Baldwin’s caregivers were previously convicted of child abuse and had a history of involvement with the child protection sector, the Catholic Children’s Aid Society of Toronto released a statement saying that, “Jeffery's death was preventable. Finding this information in our records would have led to a different outcome.” (CCAS 2014). These tragic circumstances highlight the relevance and centrality of collecting, linking, and retrieving static explicit memory to the maintenance of child safety in the child protection sector. Tragedies are often blamed on situations where crucial information is forgotten.

Actuarial risk assessments have workers convert their experience and observations during an investigation or assessment to a static risk factor, such as parenting capacity

(Wood 2011). They score a case in an effort to add greater consistency and accuracy to clinical decision-making, though the appearance of ‘technocratic regularity’ may simply disguise value judgements (Scherz 2011; Gillingham and Humphreys 2010). In Ontario, risk assessment tools from the child protection standards were built into IT systems (MCYS 2007b; 2016c) and in the UK the common assessment framework was built into integrated children’s systems at the local authority level (White, Hall, and Peckover 2009).

Static memory is at the foundation of formalized decision support tools, like actuarial risk assessments. This actuarial focus has been given new life with the exploration of predictive analytics in child protection services (Chouldechova et al. 2018; Gillingham 2019; Munro 2019). This has been occurring at the same time as artificial intelligence was being suggested as a technological solution to many public sector issues (Janssen et al. 2020; T. M. Vogl et al. 2020; Sun and Medaglia 2019). However, this trend is fixated on a repository perspective of organizational memory, where the inputs needed for these systems to run are exclusively static explicit memory, whether structured or unstructured, compressed or decompressed. Static memory is discussed in terms of service quality, the response to high profile child deaths, the quantification and management of risk, and, more recently, the application of machine learning to the prediction of risk (Schwartz, Kaufman, and Schwartz 2004; Fallon et al. 2017; Cuccaro-Alamin et al. 2017).

In England, the Behavioural Insights Team and What Works for Children’s Social Care have worked with a few local authorities to use machine learning and natural language processing to create and pilot risk assessment tools that use structured data combined with structural topic modeling of worker case notes to identify risk at the initial point of referral and assessment, as well as looking for the risk of potential service escalations (Clayton, Gibbons, and Sanders 2019; Sanders et al. 2017). Other local authorities in England are working with university, or private sector partners to pilot similar predictive tools for such referral decisions (Bright et al. 2019; Dencik et al. 2018; Sena et al. 2019). Common features

of these predictive analytics tools include an algorithm that learns from available training data and adapts to new input data over time in order to generate a risk score for a particular individual (Cuccaro-Alamin et al. 2017). While local authorities in England have begun to explore the use of these algorithmic tools, Ontario has focused more on the underlying data infrastructure (i.e., creating an enterprise case management system across its agencies), while retaining more traditional risk assessments. The following section will illustrate how, while significant, a static explicit perspective on memory alone has limitations and is not sufficient to resolve the memory-related puzzles associated with digital change in child protection services.

5.3. The limitations of static explicit memory

> *At a conference on data in the public sector, a panelist said, "I doubt there's anyone in this room whose data is perfect." (fieldnotes, 26 June 2019)*

Static explicit memory alone is an incomplete conceptualization of organizational memory as there are certain memory phenomena that evade its descriptive sphere. This section will present some limitations with static explicit memory and how they hint at the relevance of other forms of memory. Some scholars have noted the limitations of this interpretation of organizational memory, suggesting that "processes of recording [sic] keeping are incomplete, i.e. they might not always include the full summary of the policy in all its detail (positive and negative), because of concerns about accountability, transparency and the possibility of access to these policy archives through freedom of information requests." (Corbett et al. 2020, 27). This suggests that there are forms of memory that evade storage in a static explicit form. Researchers have found that workers interacting with actuarial systems tend to censor themselves (Hall et al. 2010). This speaks to a problem of some information not being collected in a repository in the first place. There is also a problem of having "detailed archival files that are never read because a new generation of policymakers does not know they exist" (Corbett et al. 2020, 43). Even when information is present, one might not be able to search or retrieve the relevant information when it is

needed. The repository needs a different form of memory to function. One local authority administrator said that “predictive analytics might just be a little blip, if we can’t sort out all the data underneath it” (T. M. Vogl et al. 2020, 952). While data might be present, it might not be of a sufficiently high quality or consistency to be credible when used. The remainder of this section presents examples of issues that highlight relevant contextual considerations that impact the quality of static explicit memory and point towards the relevance of other forms of memory. The examples of workflows, compartmentalization, and recording, will help to contextualize the place and context of static explicit memory within a broader space of organizational memory in this service sector.

5.3.1. Rules, code, workflows and inflexible memory

This section provides some examples of how rules get embedded into information systems and how this can exclude work that does not fit the model. The first example is when certain front-line work is excluded from the structured workflows coded into the Child Protection Information Network (CPIN). One supervisor shared that:

> *CPIN really didn’t take into account support services of any agency, like, how to represent that on CPIN. … I just think that … each agency has now had to come up with their own way of tracking and it’s only tracked … in contact logs[20] … for example, an investigation supervisor can go to their team and see how many cases those workers are carrying. … I don’t have that. So, I have to track everything manually… So, it’s not easily accessible (Participant 9, personal communication, 26 September 2018)*

The static encoding of rules about workflows into an information system can lead to inflexibility relative to work that does not fit the model. When discussing activities without fields in CPIN, or work that CPIN was not designed to record, another worker said that, “if that becomes a big chunk of your work … how do you measure it … you’ve got to put something in place to do that, and you can’t use CPIN to do that ... there’s the hurdles [to] doing it that are probably not worth it if you can do it somewhere else ... in a more efficient

[20] The equivalent of social work case notes in the information system.

way" (Participant 2, personal communication, 24 August 2018). In this example, rules in the system were more related to child protection than support services, and this made it more difficult for front-line supervisors to track the progress of family support workers, compared to those workers who easily fit into the child protection focused compartments of intake, investigation, ongoing, child in care, or resource. Static rules excluded certain practices and so workarounds were developed to track this work. This inflexibility speaks to divergences in memory related to the very understanding of what child protection is. This example indicates that groups have different understandings about what explicit rules about work were worth retaining, suggesting different groups have different values about what ought to be remembered and that the basis for these values might constitute a different form of memory.

Workflows were also built into information systems in England. Staff at one local authority indicated that their new case management system, "forces this specific workflow and that was the biggest change and that was the hardest thing for people to get used to, but it's also the thing that improves data quality, makes the system work, and gives transparency and oversight" (Bright et al. 2019, 15). The problem of workers having to get used to the system suggests a type of inertia, or practice-based memory. An Ofsted survey found that, "[w]orkflows within ICSs [integrated children's systems] are usually designed to mimic the sequential order in which social workers carry out their work. However, two fifths of the LAs that responded mentioned problems with how the databases were set up. In some cases, even when systems were customised to local practice, they did not capture data well." (Ofsted 2018, 7). Further, "[u]sers find it clunky and often get confused due to a lack of a process led flow through the system, which leads to a lot of data quality being completed before returns can be submitted." (Ofsted 2018, 13). One of the concerns in England was that, "[p]rebuilt system workflows are not always compatible with best practice or evolving government requirements." (Ofsted 2018, 14). There is not a perfect match between static explicit memory, the way people do their work, and how they interpret what

needs to be collected in what fields. There is evidence of a misalignment of coded workflows with practice workflows and this has unintended consequences for data entry and later data cleaning. In response, some local authorities had been changing their information systems to better align with social care tools, such as Signs of Safety, creating a better fit between system rules and practice (Participant 50, personal communication, 19 March 2020).

There is a risk of inertia when static rules are embedded in worker tools and they are unable to adapt to different circumstances. In Ontario, in response to child death inquests, standards were changed so that social workers had to see the children when they visited. Under CPIN, this needed to be documented and timelines needed to be met. This is an example of a past event being built into a rule or procedure. Past experiences from inquests were built into rules while the initial motivation was forgotten. This type of approach is reactive not proactive because it only deals with a specific problem, not potential problems. In this way, the system may end up "fighting the last war instead of addressing new [problems]" (Engstrom et al. 2020, 26)

In other cases in Ontario, there appeared to be alterations in what needed to be remembered in rules and how. CPIN had not been static for workers because changes had to be made to enable different functionalities, support standardized reporting, or harmonizing business practices. This was having impacts on workers' ability to use the system effectively. An agency administrator said, "[a] lot of the documentation practices have changed. A lot of the harmonized business practices have changed and … there's been a gap in training in the sense that staff were trained early on … at the implementation stage, but there hasn't been a follow through formal retraining, … as CPIN has evolved" (Participant 51, personal communication, 27 March 2020). Front-line workers ended up confused about the changes and had to reach out to internal administrators, with one saying "I've gotta call them up, 'what does that change mean to me?'" (Participant 19, personal communication, 30 November 2018). This also had implications for analytics staff whose standard reports were

constantly being broken by rule changes in CPIN. When discussing mistakes in standardized reports after ministry changes to the information system, one worker said “you go back and there’s something that’s linked that they didn’t realize when they made the change … there’s … that downward effect that they haven’t necessarily predicted” (Participant 40, personal communication, 4 November 2019). In this case, rules were not always static, requiring dynamic adaptation. Rules can be rigid and inflexible, but they can also be subject to change in response to the needs and objectives of different groups. This suggests that there is more to the phenomenon of organizational memory than merely what is static and explicit.

5.3.2. Roles, compartmentalization, and the fragmentation of memory

Roles were impacted by information system change through compartmentalization. CPIN compartmentalized different functional areas. While this compartmentalization of functions was not novel for some agencies, it was for others. CPIN is divided between initial screening, investigation, ongoing services, taking a child into care, and resources (such as residential or foster placements). These compartmentalizations ensure that while the recorded memory about cases and clients is spatially connected, the contextual memory held by workers is fragmented between workers and over time. This has three key impacts: (1) memory about cases and clients is fragmented between workers, (2) workers can only remember how to do recording in their functional area, and (3) despite the promise of having spatially connected information within CPIN, certain design choices prevented this from being realized.

The roles that compartmentalization embedded in the system had implications for what different workers knew and how they interacted. One ongoing worker explained that responsibility for a family could end up divided, with a kinship worker responsible for the child, while they retained responsibility for the parents: “I work with the mother and the father of that child, but … I don’t have to see that child because the kinship worker is seeing the child” (Participant 18, personal communication, 31 October 2018).

While staff worked in the same system, the landing page and tabs available for data entry and retrieval differed depending on their role in CPIN (fieldnotes, 3 October 2018). Each worker was only trained in the area of CPIN in which they worked, so they did not have an understanding of the conditions and expectations facing workers in other compartmentalized areas of the service delivery pipeline. One supervisor said, “all of us at the time were only trained in the area that we worked … we might not have a … good understanding of … what they need triggered on their end, … but that was just a procedural piece” (Participant 9, personal communication, 26 September 2018). A worker in one compartment (like investigation) could not see or understand what a worker in the other compartment (like ongoing services) was experiencing. The information system was insensitive to the realities of the work, and workers from one division did not understand the informational experience of a worker in a different division of the labour.

With the introduction of CPIN, rules for a specific division of labour (compartmentalized rather than holistic) were built into the system. Those roles were embedded in the code of the system, such that they also controlled access to information and sometimes limited the extent to which recorded information was pulled over from one compartment to the next (with some workers complaining that they would need to re-enter data after a case was transferred across a compartment (Participant 10, personal communication, 26 September 2018) and others that they would need to read the recording in another compartment because it would not carry over into theirs (Participant 16, personal communication, 7 December 2018)). Attempting to make roles static may enhance a sense of regularity; however, it is also inflexible relative to the interactions and transfers across boundaries. This suggests, again, that more fluid memory processes are at work.

5.3.3. Records and disruption to the processes of remembering

This section looks at the influence of digital change on how memory is collected and consolidated into storage mechanisms, how this stored memory is maintained over time, and

the implications for search and retrieval. Much of the data in the sector was derived from the recording of service level activity. Issues of data quality at this level can have implications across all levels of the organization. Examples highlight some of the limitations of a focus on static explicit memory in records.

The impact of migration on duplicates, search, retrieval, and analysis

In Ontario, when agencies were moving from their legacy systems to CPIN, there was little understanding of the cost of migrating historical files and there was a ministry focus on migrating only information needed to manage active cases and for measuring performance and administrative compliance. As a result of these factors, the ministry made a decision to only migrate files that were active at the time of migration into CPIN (Participant 3, personal communication, September 6, 2018). It is also important to note that while CPIN was considered to be fully implemented by the ministry, many societies continued to use their legacy case management systems to search historical records because not all elements of those historical records were migrated into CPIN. One agency analyst said that "[s]ome of the individuals with missing incidences included those responsible for maltreatment" (Participant 27, personal communication, 4 November 2019). However, many front-line workers believed that everything was on CPIN, with another analyst saying "there is an assumption that we have everything uploaded" (Participant 42, personal communication, 5 November 2019). Decisions about what static memory to prioritize for migration created risks that critical child protection information could be missed and illustrated differing background understandings about what was important.

Search for historical records became more dependent upon written procedures or relied on staff who had practical memory. One staff member explained,

> *if you look at someone who's … been doing intake for ten years versus someone who's just started, … are like five months into it, you're probably going to find … this person with ten years will know how to do it a lot better. (Participant 16, personal communication, December 7, 2018)*

The fact that not all records were migrated into CPIN created a problem when trying to search the historical records of other agencies because CPIN "will only tell you what's been uploaded. It won't tell you … what's stored in those ancient files, which not every agency has uploaded" (Participant 21, personal communication, November 20, 2018). Another worker explained, "I wish [the system] had kind of helped with a better way to do history, but history's what it is. You have to read it [with] your own eyes and make sure that it's correct" (Participant 14, personal communication, 4 October 2018).

There was also an impact of data migration issues on analysis. Some agencies did not have links from legacy data to CPIN data and they lost the ability to compare data over time and translate static data into a dynamic narrative for front-line or strategic decision making (Participant 32, personal communication, 15 May 2019). This created a break with the past in terms of analysis: "all closed case data in the legacy system was put into a PDF format into CPIN, which means we can't use it or extract it for analysis purposes. So, again, we can only use data … from the time of go live going forward." (Participant 32, personal communication, 15 May 2019). This type of data preservation also limits its dynamic processing using machine learning (Participant 33, personal communication, 6 June 2019)..

The issues with migration were evidence of a disregard for the outcomes element of the policy narrative. Sector data analysis staff indicated that,

> *although they'll talk about it being about measuring outcomes, … you really don't have that capacity to measure outcomes in CPIN. It is much more about, … accountability, measuring standards, measuring compliance, measuring counts. So, although the talk was about outcomes, the fact that they didn't even migrate OnLAC into it is pretty clear to me … what they said and what's really in existence are two different things. (Participant 47, personal communication, 23 January 2020).*

This staff member elaborated on their example of the outcomes data from the OnLAC framework and its treatment during migration and maintenance:

> *when we were migrating, we said, 'where can we put our [legacy system client identification] number on the CPIN so that we can always maintain that connection?' They're like, 'well, we don't really know. We haven't worked that out. …' one of the fields that doesn't get migrated every time there's a new change in the golden record, is that flag where we put our*

> *[legacy system client identification] data. So, most of our files, we don't have access to that number anymore, which is just a massive loss, … it's crazy they didn't think that through beforehand. (Participant 47, personal communication, 23 January 2020).*

This demonstrates clear differences and contradictions between the narratives of information accessibility for service and administration and the reality, suggesting that different groups have different ideas about what should be remembered, especially given how these differences and contradictions can be observed.

Another issue in Ontario was that there was a proliferation of duplicate records within and across agencies. There were inadequate matching algorithms to merge duplicate records, and workers continued to create duplicate records. Some clients were transient and moved between agencies, meaning that their records existed in multiple legacy systems prior to merging. One worker explained that "if you have transience, people who are moving between agencies, they will end up multiple times in the system" (Participant 7, personal communication, 25 September 2018). Where there were already duplicate records within an agency, this exacerbated the problem of duplication when they were added to the duplicates of other agencies. One participant indicated that during system integration "every time a new agency comes in, it increases our duplicates" (Participant 7, personal communication, 25 September 2018). Duplicate records posed a real challenge because of difficulties of ensuring records were not missed during search. One worker mentioned a situation where 33 duplicates were found, it took four days to review them, and more duplicates were found in the process (Participant 43, personal communication, 5 November 2019). Duplicates also highlighted how static memory could not be trusted without the appropriate underlying understanding and ability to identify, verify, and merge duplicates.

With these types of data quality issues, problems could arise at the service, administrative, and algorithmic levels. At the service level, previous inquiries into high profile child deaths revealed that pivotal records that could have changed decision-making around a case hinged on identity errors (for example the misspelling of a name, the reversal of first

and last names, or the use of maiden names, married names, or nick-names, either intentionally or unintentionally) (OCC 2014; Choate 2017; Blatchford 2013). Some participants expressed concerns about these multiple records, one indicating that, “a name may come up, but I know that there is history from before that [the system] is not recognizing.” (Participant 13, personal communication, 26 September 2018). Another explained that “if I wasn’t paying attention, or if I was just searching for my kid, because I knew that was his date of birth, I would think, when I’m looking at this, ‘oh, this kid’s only been involved with [our agency]’. There is so much history with [another agency], you could miss it, right” (Participant 1, personal communication, 28 September 2018). Worker responses to these static explicit memory issues gesture towards the relevance of other forms of memory, like the practical memory of their cases. In this context, another worker described the anxiety associated with seeking through possible and probable duplicate records saying that “I am scared out of my tree because what if I miss one?” (Participant 20, personal communication, 20 November 2018). With duplicate records and misattributed data because of inaccurate merging or missing data, the reliability of static explicit memory for service level, operational, strategic, or automated decision making comes into question. If workers are not confident in the quality of the data without tacit historical knowledge of their clients’ files, then the application of AI could also miss or misattribute data.

Inattention to other forms of memory can exacerbate problems with static records. To try and address this problem, efforts were made to merge records using simple matching algorithms, but there were too many failures, so the ministry left it to the individual agencies (Participant 7, personal communication, 25 September 2018). In the context of these data quality issues, one worker described the continued creation of duplicate records saying that “staff, in particular, who deal with referrals, there’s only so much work they can do. Sometimes they search to see if it’s the right person and they get thirty copies, and they’re like, ‘I don’t know which one to choose. Well, since I don’t know which one to choose, I’ll

create a new one', you now have thirty-one. And that happens all the time" (Participant 7, personal communication, 25 September 2018). Issues of record ownership, tight timelines, and accountability were also impacting the creation of new duplicate records. Record duplications were observed during staff search activities and sufficient information to merge records was often missing or could not be verified. A worker noted that "one person may have two different numbers … and you don't know if that's the same person." (Participant 14, personal communication, 4 October 2018). Another participant indicated that "if we have a history and we know that it's this person and their address is the same and we have other data, we can still … merge … the record, but we can't click verified, because we didn't actually see that documentation" (Participant 9, personal communication, 2 October 2018). Duplicate records were seen by some as "one of the biggest risks" (Participant 1, personal communication, 28 September 2018). These examples highlight the importance of understanding the existing context (for example existing records and repositories, challenges of collection, and potential impacts on search and use activities).

One of the purposes of unique identification in public services is to make people legible for service delivery, administration, and strategic decision making at a population level (J. C. Scott 1998) and to avoid the propagation of duplicate records (T. M. Vogl 2020a). Data collection can be a challenge in a sector where system avoidance is an issue and clients may withhold or give false information. There are intentional reasons (system avoidance, where people do not necessarily want to be legible) (Brayne 2014) and unintentional reasons (errors and omissions) (Just et al. 2016) that counteract legibility. To try and resolve this issue, Ontario introduced a policy to verify client identity by requiring the recording of government issued ID. This created some discomfort at the service level: "at first, it creates this uncomfortableness with that conversation" (Participant 12, personal communication, 26 September 2018). In some cases, it may not even be possible to get identification. One participant explained that "some families may not have, or willingly give us

identity information" (Participant 9, personal communication, 2 October 2018). An effort to address a static explicit memory issue was insensitive to the dynamic front-line interactions, which risked undermining the effort. Identity verification was necessary from a data integrity standpoint, but was seen as challenging, inconsiderate, or blunt from a practical front-line perspective (specifically, in dealing with families where trust is already strained and building an interpersonal relationship is key). Static memory was overriding other forms of memory that informed the practical context.

In England, there was also evidence of similar issues with search and retrieval of static memory. There were duplicate records within local authority children's social care records that would emerge when trying to link data with the unique pupil number (DfE 2020). One local authority that had recently changed information systems found that when they were extracting text data, sometimes they would find text that just pointed to where you would find the relevant information, conceivably in a legacy system or attachment (fieldnotes, 3 March 2020). One local authority migrated to a new system, but hired a migration specialist to match field codes. Some records were included as PDF attachments (generally paper and microfiche); however, the migration was complete (fieldnotes, 14 May 2020). There was also evidence of different interpretations of data fields in England. One informant indicated that while everyone had to complete statutory government returns, and legislative requirements were very clear, with nuanced things around some of the details of the requirements (e.g., when a referral begins, whether a day is a 24-hour period or a calendar day, and how to count a weekend), there was room for interpretation and practice may have differed between local authorities across the country (fieldnotes, 17 May 2019). After having the circumstances in Ontario described to them, a local authority respondent indicated that one of the challenges of a centralized system with the same definitions and consistent fields across all local authorities is that local authorities want to build their own custom reports and monitor their own statistics (fieldnotes, 14 May 2020). These findings

from the enterprise CPIN project coupled with the English example of having the independent choice to make a complete migration to a new case management system, help to illustrate different approaches to the treatment of the same type of static explicit memory.

Differing interpretations and data collection and extraction

There were also questions related to differing interpretations and data collection. One informant indicated that data quality was impacted by people inputting data with different interpretations and human error (fieldnotes, 11 March 2020). This can be exacerbated by a lack of rigid workflows coded into the information system. An Ofsted survey of local authority ICSs found that "[t]he data validation from stat returns (Cin/903) are not mirrored in ICS, so workers can do things in the system which cause errors in submission." (Ofsted 2018, 10). The static form of memory is inflected by other interpretations and how people record, suggesting that there is memory about what things mean and how to do things. A staff member at Ofsted indicated that a big challenge from a lack of ownership is definitions, meaning that there is no consistent measurement (fieldnotes 28 May 2020). In England, data elements depended on government requirements. Informants indicated that when the Ofsted requirements change, they have to make sure everyone is counting things in the right way. This process would sometimes be initiated by Ofsted to ensure that everyone was using the same definition. In these cases, Ofsted would do workshops and FAQs and this was an opportunity for other local authorities to discuss interpretations (fieldnotes, 9 July 2019). These issues made it difficult for Ofsted to extract, report, and analyze children's social care data (Ofsted 2018). In terms of the statistical returns, annually there's a back and forth between central government (statisticians) and local authorities to sort out the quality of the data (fieldnotes, 17 July 2019). This suggests that people are thinking about and doing things differently across local authorities, despite having the same static explicit memory expectations.

Issues of interpretation also impacted predictive analytics projects in England. A data scientist working on a predictive analytics project found that there were issues with harmonization across the sector such that each local authority had a different interpretation of the practical instantiation of the statutory requirements, making it difficult to compare across local authorities (fieldnotes, 24 June 2019). In a report on their predictive analytics project, What Works for Children's Social Care found that, due to the fragmented nature of the system, with local decisions by independent local authorities, there were concerns about the comparability of data inputs for predictive analytics algorithms between local authorities (Clayton et al. 2020). As a result, "given the way that children's services are set up in England, it is difficult to increase the sample size by collating data from different local authorities given that practice models and case management systems can differ greatly." (Clayton et al. 2020, 81).

Static memory depends on the tools for extraction that are in place. Local authority data extraction was not designed for the data needs of predictive analytics models and had to be custom done in some cases. What Works indicated that

> *Where the selection of the sample was done at the stage of data extraction, this was considerably more complex than running reports as usual because we were interested in historical information on children who had experienced a particular outcome within a certain time period (e.g. entered care from April 2018 to March 2019), requiring a selection of cases by child identifiers whilst reporting for Ofsted and the Department is usually selecting a population within a date range. The query languages for case management systems do not seem set up to handle this type request. (Clayton et al. 2020, 28)*

Static search and retrieval rules in information systems can influence what records can be most easily returned. This is a reflection of earlier difficulties adjusting data extraction processes for Ofsted's Annex A returns (Munro 2014). What Works further indicated that, "[i]n some cases, this involved IT teams writing custom SQL queries." (Clayton et al. 2020, 28). In England, there were also different levels of capacity for data extraction for predictive analytics projects across local authorities. One local authority sent over a .csv file after an experienced analyst had run the extraction and looked over the data (fieldnotes, 3 March

2020). This provided some assurance that it was accurate, but in the absence of explanation, could undermine replicability. Another local authority did not have the capacity among their analysts, so the extraction task was sent to the IT team (resulting in less assurance that the data would be accurate and representative) (fieldnotes, 3 March 2020). This difference highlights how on the one hand raw data extracts might not be accurate and representative, but on the other that efforts to clean and prepare data outside the information system could make replicability a challenge. It also highlights how analysts could add value by quality checking the data and how issues could arise when front-line workers were responsible for data entry. Data requests for predictive analytics differed from those used for statutory returns. “there was a considerable amount of ‘data cleaning’ to get the data in a format ready for the model.” (Clayton et al. 2020, 29). Again, data was available, but required manipulation before it was accessible in particular forms for particular functions. These examples hint at more fundamental underlying forms of memory related to practice and conceptual frameworks that shape what static explicit memory is retained and extracted.

The next example looks at how system level decisions could make certain information difficult to retrieve. A quality assurance worker in Ontario presented a distinction between unstructured case notes, which were rich in information, but difficult to retrieve from CPIN, and the structured data fields such as check boxes and drop-down menus that were simple to retrieve, but that did not provide much context. The worker explained:

> *the contact logs [case notes], for example, they can have really rich narrative, but it’s not something easily accessible … it’s not even accessible for downloading ... and doing a content analysis ... So, then you’re beholden to just dates [striking the desk], really dates [striking the desk again], and ticky tacky, tick boxes, and that can only get you really so far, if you’re really trying to understand the work (Participant 2, personal communication, 18 August 2018).*

Data was stored, but not accessible for analysis and interpretation. Information related to compliance and performance were easier to retrieve than the narrative content of the records. This worker went on to describe the limitations associated with this imbalance:

> *“CPIN is ... meant to measure whether something has been entered or not ... [However,] if you’re really wanting to know whether something’s working or not, or what somebody’s doing or not, probably the worst thing you can do is just measure whether you see something entered or not, because you don’t know the quality of that, or what’s been done” (Participant 2, personal communication, 24 August 2018).*

A front-line worker corroborated this concern, saying “it will capture what I input” (Participant 13, personal communication, 5 October 2018). The difficulty of understanding child protection outcomes may be one reason why the focus has been on “things that are easy to count, … rather than the things that really matter" (Wilkins and Antonopoulou 2020, 865). These examples show evidence that unstructured data was not seen as valuable in Ontario, that the focus was on whether recording was completed in conformity with standards, but that recording may only represent a fraction of the client’s reality and the work done in the field.

In terms of analysis, some supervisors were asking for more nuanced data from the unstructured notes that would help them weight case complexity to help make decisions about the allocation of caseloads (Participant 41, personal communication, 5 November 2019). Contrast this with the efforts in England where unstructured data became an important part of some predictive tools (Clayton, Gibbons, and Sanders 2019; Sanders et al. 2017). However, even there, unstructured data was seen as limited insofar as it was not considered sufficiently consistent across local authorities, due to differing practice models, and its inclusion in models was not found to offer much value in terms of predictive accuracy (Clayton et al. 2020). This suggests that the static explicit memory that is collected and made accessible for analysis is incomplete and depends on the underlying values, expertise, and understandings of different groups.

5.4. Indications of other forms of organizational memory

The examples in the previous section have shown some general issues with static explicit memory and suggest that static memory is not the exclusive form of memory in an organization. This section shows how these issues point towards other forms of memory. In

particular, a more dynamic form based on inter-agential communication, and a more tacit type of memory operating in the background and driving the focus towards administrative ordering.

5.4.1. Examples that suggest a dynamic form of explicit memory

Scholars have suggested a second explicit form of memory in contrast with the static form. They have looked at the limitations of static memory, mainly, that it does not capture knowledge that is scattered across organizations and difficult to express in writing or in quantitative terms (Corbett et al. 2020; Stark and Head 2019). For them, a static definition "neglects the specifically human characteristics of memory" (Rowlinson et al. 2009, 76) and downplays remembering as "a collective, historically and culturally situated practice" (Feldman and Feldman 2006, 861). It is for this reason that a data scientist working on a predictive analytics project suggested that,

> *a machine alone cannot make a decision that has legal consequence for an individual … even the legalities of it aside, I think it's absolutely correct that the human makes the final decision because they are able to understand, there may be some pieces of a particular case that are very unique to that case … we very much view this as a decision aid" (Bright et al. 2019, 8)*

This is an acknowledgement that the machine is operating on incomplete data and that there may be something tied up with the interpersonal relationships, conversations, and stories.

There is dynamic remembering with coworkers and clients that is not amenable to the static demands of the information system. One example was about recording compared to dynamic work in the world, and the fact that they may diverge: "CPIN … may look or seem as though I haven't asked, or I don't know where the child goes to school. I do know where they go to school, I just don't know where to put it" (Participant 13, personal communication, 5 October 2018). In another example, during a fieldwork observational session, a worker became confused about how to input education data into the case management system and turned to a more interpersonal way of remembering, saying "Okay. Let's, young people, basically" (Participant 18, personal communication, 31 October 2018), before seeking out a

younger coworker to help create the educational shell (Fieldnotes, 31 October 2018). These examples illustrate worker sentiment about static explicit forms of memory and the value they see in more dynamic memories developed through their professional interactions, pointing to a more dynamic type of memory embedded in intersubjective communication.

5.4.2. Examples that suggest tacit (or non-explicit) forms of memory

There are also types of memory that are neither static nor explicit. Scholars describe a more tacit form of memory that structures thought, but that is not necessarily explicitly articulated (Douglas 1986; Tuomi 1999; Bowker 2005; Polanyi 2015). Tuomi, for example, says that

> *human cognition cannot see simple facts without these facts being part of its current meaning structure … much of this meaning structure is unarticulated background against which articulation and explication happens. Therefore, organizational memory and memory support systems need also to address this unarticulated component of meaning … A key question in the design of organizational memory systems is, therefore, to address those socially shared stocks of meaning that remain tacit in the process of articulation. (Tuomi 1999, 2)*

As shown in the preceding examples, central administrators in the ministry made decisions about what information would be migrated and what would be left in legacy systems. This often took the form of decisions to migrate data that would be necessary for administrative purposes and measuring compliance with standards, but not migrating narrative information in case notes that was of use for front-line service delivery (Participant 1, personal communication, September 28, 2018). The migration simplified information based on general concepts that could be easily reflected in counts or with check boxes, dropdown menus, or time-stamps. These represent elements that were better suited to administrative ordering, compliance reporting, and traditional performance monitoring, but that did not suit the memory needs of social workers in their professional practice. This suggested that there were perspectives and ways of thinking that differed and that were based on non-explicit forms of memory.

5.5. Concluding statement

This chapter's examples were intended to show how static explicit memory is an important piece of the memory puzzle in organizational settings, but that it is not the only form of memory at play. We saw limitations such as inflexibility of rules, fragmentation of roles, and disruption to the accuracy or stable interpretation of records. It also begins to show how there was a focus on administrative ordering of the service system over addressing the more difficult questions of child safety and family stability. Static memory can be in the service of a particular perspective and not actually represent an objective (neutral) reality.

These limitations have implications for analytics projects in government. The application of algorithms to data where not every record is merged, where records are merged inaccurately, or where a client has been mistakenly duplicated could undermine the reliability of algorithmic decision support through false positives or false negatives and could result in real world negative impacts on individuals. Some AI scholars have suggested that AI problems are really just data problems related to acquiring, sharing, cleaning, and using data (Sun and Medaglia 2019; Dwivedi et al. 2019; Janssen et al. 2020). According to them, making AI work depends on fixing the data. If there are other forms of memory surrounding the data problems, then ignoring them may allow for the continued perpetuation of these problems. More attention is needed to how data is shaped by the larger memory context. This suggests that optimism about artificial intelligences in government will need to account for the influence of memory beyond data when trying to make sense of machine learning and analytics outputs.

This chapter provides greater conceptual clarity about what those hoping to depend on records for their technological benefits need to consider. In particular, the examples preempt the next two chapters by showing how a focus on static explicit memory alone fails to consider both the dynamic memory processes surrounding the stories and conversations

that shape and bring static memories into being, and the more tacit form of memory that appears to give some structure to group thinking. An expanded typology of organizational memory is needed.

Chapter 6: Dynamic explicit memory

> *Static conceptions of memory have, to date, not led researchers towards workable solutions. It is our hope that in presenting this dynamic conception of memory we can orient researchers towards new avenues of exploration that will help institutions of the future to better remember the lessons of the past. The way institutional memory is conceived has been in need of a new story. (Corbett et al. 2020, 60)*

The idea of dynamic memory in public administration circles has gained some currency as a means to overcome limitations with primarily static conceptions, and in so doing, to help institutions to better remember lessons from the past. While this chapter will show how dynamic memory builds on static, it will also highlight how benefits and areas of applicability may be overstated. The previous chapter defined static explicit memory, situated it within current debates about data analytics and artificial intelligence in policy and practice, and provided some examples that call into question the idea of organizational memory as simply rules, roles, or records.

This chapter defines dynamic explicit memory and presents some examples of how it has been understood in public administration. It will then present some examples from the research of this form of memory's scope of applicability, including what dynamic memory adds to static. It will also show that, while dynamic memory does add to the concept of organizational memory, it has limitations and is not able to account for all memory phenomena in public sector organizations.

6.1. Definition of dynamic memory

Dynamic memory is intersubjective communication and it depends on a belief in memory as reconstruction. This memory is dynamic insofar as it involves the re-interpretation of past phenomena and explicit insofar as it involves communication between agents, which may include technologies that assist with the interpretation of past events.

Dynamic memory is seen to give meaning to records “through the exercise of human agency." (Corbett et al. 2020, 53). But files and electronic records are not the only ingredients for dynamic memory, some scholars suggest that “[algorithmic] models function as narratives and offer a distinct way of telling the story about a particular issue.” (Kolkman 2020, 2). The key is that "[w]hat causes static memory to become dynamic is constant retrieval and re-evaluation through social interaction between actors as they translate static documents into living memories." (Corbett et al. 2020, 8). Dynamic memory is seen to have the following characteristics: it is synonymous with organizational memory, depends on interpretation, combines records with the interpreter’s perspective to create stories, and is “a composite of intersubjective memories open to change” where actors combine “the documentary record with their own perspectives to create stories about the past” (Corbett et al. 2020, 2). In this case, storytelling is “the intersubjective retelling of events that imbues them with meaning" (Corbett et al. 2020, 9).

This public administration perspective takes a human-centric position that fails to account for the role of technology in dynamic memory processes, suggested by actor-network theory (Callon 1984; Latour 2005) and studies of the socio-technical and sociomaterial (Orlikowski and Scott 2008; Leonardi 2012). While storytelling is an element of dynamic memory, this thesis takes the broader position that dynamic memory is inter-agential communication about the past, which does not preclude the involvement of technology in dynamic memory processes.

6.2. Relevance of the dynamic memory perspective

We will look at two examples of inter-agential communication to illustrate the applicability of dynamic memory in child protection. The first example looks at cases where alternative forms of technology and applications for social workers promised to improve the ability to monitor, explore, and interpret the meaning in their cases. The second looks at the role of intersubjective communication for search specialists and the transmission of knowledge about how to search for records.

6.2.1. Examples of technology's ability to enhance dynamic memory

In contrast to historical concerns raised about the Integrated Children's System in England (Parton 2006; White et al. 2010), information systems do not necessarily impose a database approach to memory. Some child protection scholars discussed this in terms of user-centred design (Gillingham 2012; Wastell and White 2014). It is possible that a dynamic approach could be enhanced with technology; it depends on the design of the systems and for whom those systems are intended to work best. There are examples of applications built on database foundations that preserve database and administrative forms of knowledge, but that also enhance narrative and social forms of knowledge for service provision (T. M. Vogl 2020b).

This section looks at three examples in local authorities where technologies were implemented in a way that supported dynamic memory processes at the front-line and in local administration. The first is the use of structural topic modeling using natural language processing to find relevant passages in case notes for predictive analytics projects. The second is the use of dynamic genograms to help workers visualize their clients' trajectories through service. The third is a dashboard used by supervisors to identify areas for improvement or further analysis. These examples represent information technologies that could be built on a foundation of underlying database systems to help workers in different roles to recover a dynamic focus.

One example is the structural topic modelling component of the Behavioural Insights Team's machine learning and natural language processing tool for local authorities to assist workers with initial case assessment. The tool used a combination of structured and unstructured data, including worker case notes, to identify case characteristics that could help to prioritize cases. Analysis of the unstructured data involved finding and grouping key passages in case notes and sharing those groupings with workers to understand if the identified groupings represented topics that made sense to them (see figure 4).

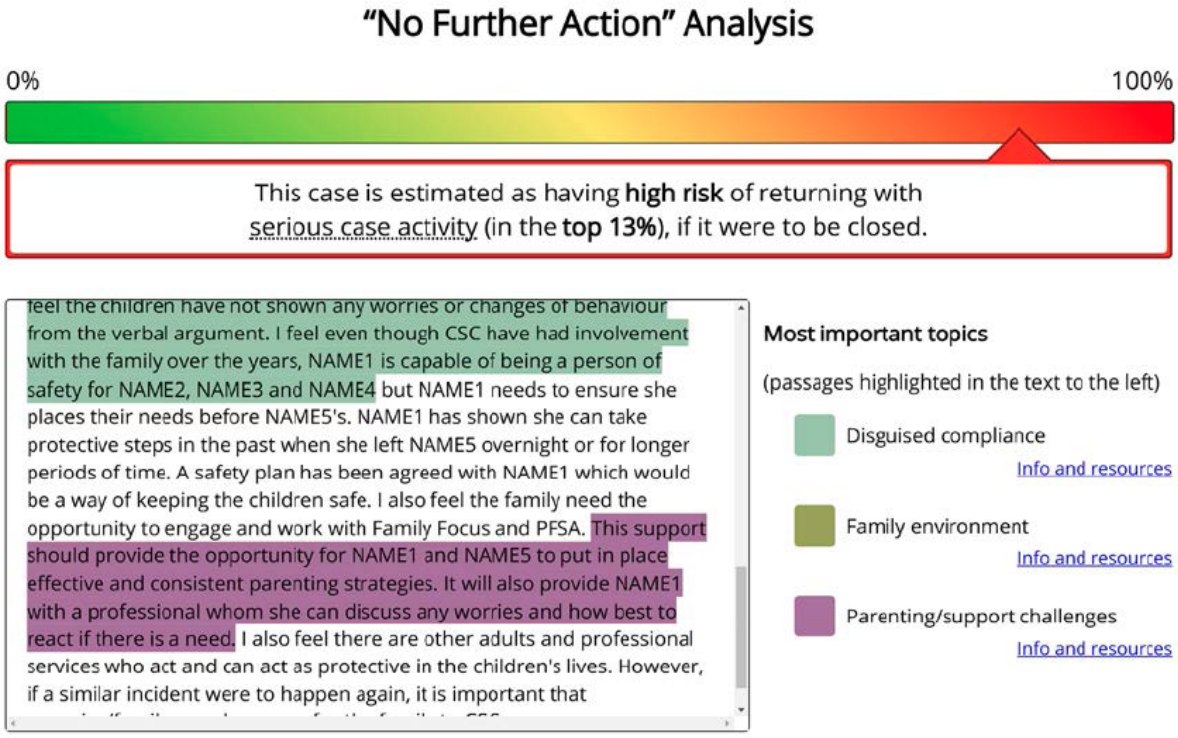


Figure 4: Design of the prototype children's social care risk assessment tool (Sanders et al. 2017, 20)

Members of the Behavioural Insights Team indicated that sharing topics from the model "was important for this project because social workers would need to understand the reasons behind the algorithm's suggestions for any particular case in order to combine these insights with their own expertise" (Sanders et al. 2017, 18). In this example, the front-line knowledge of the social workers was used to make sense of the topics drawn from case

notes in the database in order to develop an application that could translate and interpret the static memory in the database into usable insights for front-line social work. While this tool was used for risk assessment and the prioritization of cases, the structural topic modelling element leveraged the collective expertise held in the narrative case notes of social workers, engaged workers in the interpretation of the model's results, and suggested that more sophisticated record search than what was then available could be done with the help of structural topic modelling. This could be seen as one way in which technology could enhance dynamic memory by identifying patterns and improving search and retrieval of passages on relevant topics to enhance conversations between workers. While the use of predictive analytics for risk assessment has been subject to controversy (Leslie et al. 2020), this example of structural topic modeling on case notes illustrates how algorithms could enhance dynamic memory by widening the uses of algorithms to meet other worker needs.

In light of concerns about individual blame attribution in the English context, one risk that a member of the Behavioural Insights Team raised was that "it's very important that any kind of tool or decision aid that comes about as a result of this work is not used as a performance management tool, or anything to beat social workers about the head with because the moment you do that, then it starts to open the possibility that they will begin to game the predictions … so the tool itself will not be making effective recommendations because it's being fed information that's designed to trick it" (Bright et al. 2019, 9). This suggests that workers may dynamically adjust what is remembered to resist what they perceive as unfair blame attribution.

The second example is dynamic genograms, which represent another type of application that could shift the balance from static to social work-friendly dynamic forms of memory. Manchester City Council developed an integrated database with an interactive front-end that workers could use to visualize a family, the connections between its members, and the interaction of family members with services over time (see figure 5) (Henry 2016).

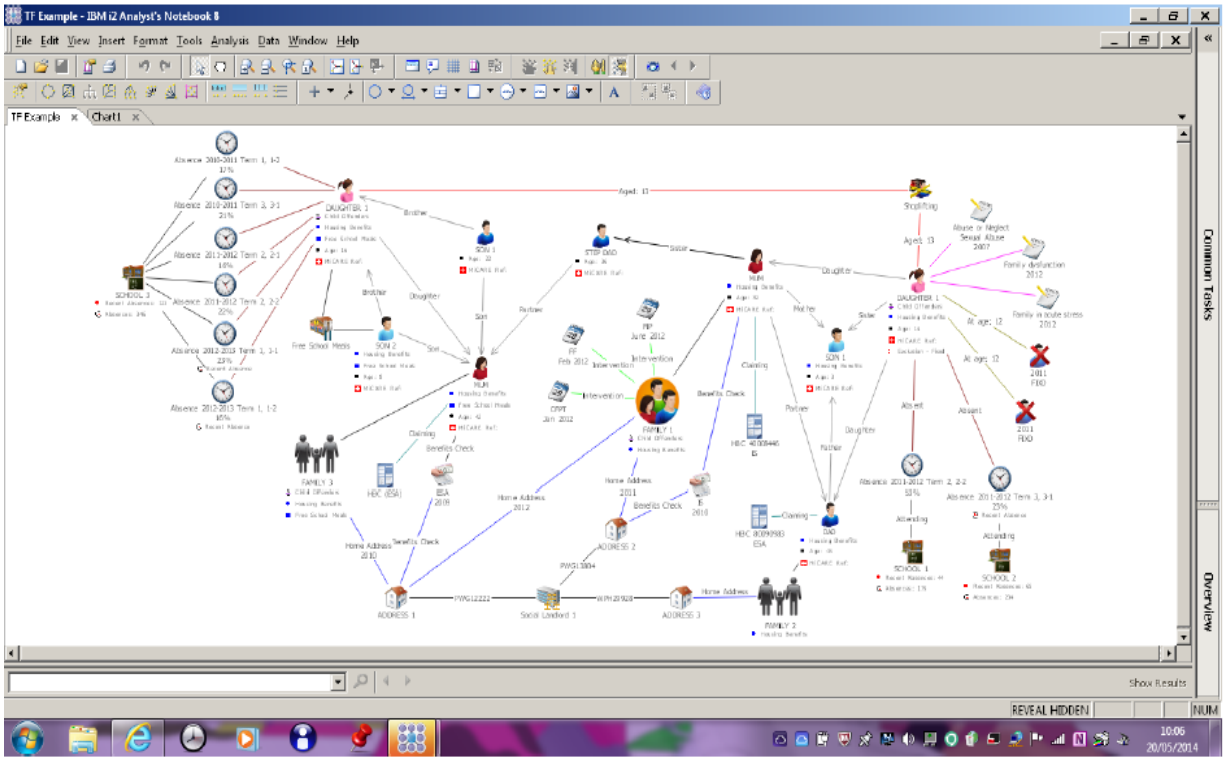


Figure 5: Screenshot of the visualization tool used in Manchester (Henry 2016)

Genograms represent a familiar tool in social work practice and could be enhanced by new digital technologies to put complex information in a visual form that could help social workers to see narrative service trajectory and understand the dynamic elements of their cases (Pope and Lee 2015). This type of tool helps translate static memory in an administrative database into a form that supports dynamic interpretation of case history and direct client service provision.

Finally, dashboards were implemented in Waltham Forest Council for supervisors and managers to monitor service trends and performance and communicate their interpretations (Jussa and Mallo 2017). User feedback on the tool did not focus on static indicators, but instead on how “[i]t shone a different light on our service information and thus provided us with analyses of our performance that are new to us and which present lines of enquiry that we may not otherwise be as proactively aware of” (Jussa and Mallo 2017). The

tool afforded a means to pursue new lines of enquiry and better understand service (such as where people might be underserved), rather than focusing on compliance. An administrative database logic was the foundation for a more dynamic approach to remembering that could support the identification of previously unnoticed historical service phenomena, new lines of enquiry, and areas needing strategic decisions about service (figure 6).

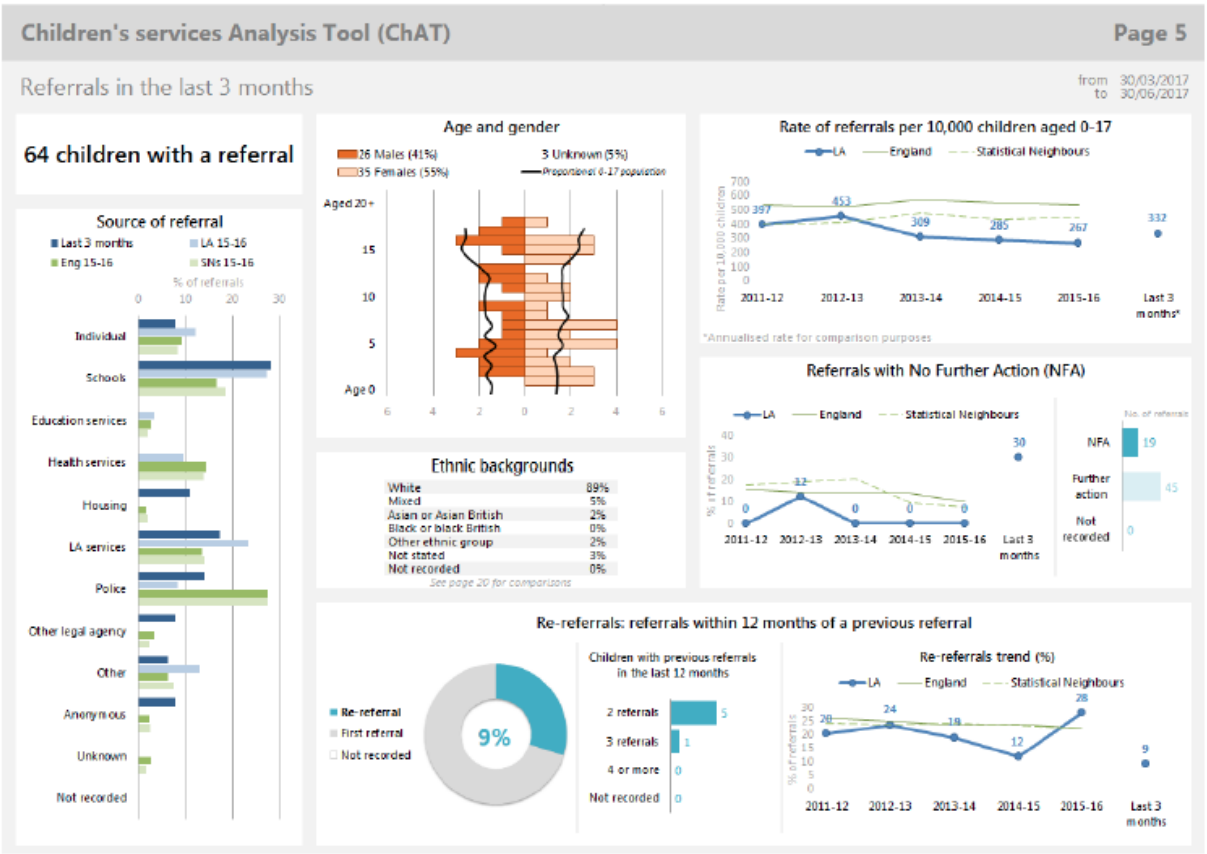


Figure 6: Children's service Analysis Tool (Jussa and Mallo 2017)

While these examples appear to demonstrate instances of dynamic memory, this is purely speculative, as there was little data available on the practical experience of workers relative to these technologies. One participant suggested that local authorities do not want to reveal that 'under the hood' things might not be working (fieldnotes, 28 May 2020). There might be more to organizational memory in child protection than just narrative records.

6.2.2. Intersubjective communication about legacy system search

Dynamic memory can also assist with search and retrieval of information in child protection case management systems. This section looks at two examples, one in Ontario and one in England. The first is the role of experts in understanding overlapping legacy systems in Ontario. The second is the benefit of having experts in the meaning and history of data elements in English local authorities when trying to facilitate the extraction of data for predictive analytics projects.

Understanding overlapping legacy systems in Ontario

In Ontario, someone with historical knowledge of where information was located was needed to convey that information to others in interpersonal conversation. As noted previously, not all historical information was migrated into CPIN. So, search for historical records spanned multiple legacy systems. One worker described how,

> *the cases that were closed when we migrated to CPIN are just shells that will give you some meta-data to say what the legacy number was and then you can go into the legacy system and look that up. … so it's critical in the record check process and in the search for history that someone knows how to do all of this, until it's one stop shopping, 'cause there's probably some people out there that think that it's all there, … it's just that constant reminding people" (Participant 1, personal communication, 28 September 2018).*

Users needed to be reminded that not all case information was in CPIN. Sometimes dynamic memory became an important and unacknowledged form of memory where the structure and design of technology hindered workers from building client-level narratives. One worker said, "I know that there is history … from before that CPIN is not recognizing" (Participant 13, personal communication, 26 September 2018). In the case of CPIN, history search often required finding relevant facts across multiple systems. Some individuals or teams within agencies possessed the relevant knowledge of how to find the relevant facts and figures and had to share that knowledge intersubjectively. Managing multiple overlapping information technologies became a dynamic process where individuals

possessed and communicated the historical knowledge needed to guide workers appropriately.

Depending on the dates of client involvement or the type of involvement, records may have been in a different information system, like microfiche, legacy archives, or function specific databases. A worker at one CAS said,

> *we've had different platforms of recording throughout the years, … I do record check training still because I have the history … you'll say to the worker, 'oh, when was this case opened?', 'well this case was open from, you know, [the 1970s]', 'okay, well you have to check, then that case will only be on micro-fiche', because we haven't uploaded all our micro-fiche to [our digital repository], yet, 'oh, okay', and so it's like, 'so it was open [in the late 1990s', 'okay, you have to go to the [legacy archives] because it's the only place where the recording is' and then we went to [another system] in [the 2000s], if your case was opened during that time you can find it here, if there was a [specific type of] case, depends on the dates, you have to go here, or here, or here, or here, or here, or like. It's completely complicated. … even people who have been here for years were like 'oh, oh my God'. And you don't want it to be complicated, 'cause then they're going to miss stuff but you try to make it as easy for them as possible. … once everybody knows where everything is, then I can walk away from it, but, …, until then, … I still am involved in … that piece of it … I think you have to live through it because … every five years they changed things, right. (Participant 1, personal communication, 24 August 2018).*

Not only was there a need for dynamic communication of the history of case management systems to ensure thorough search for records, but there was a sense in which it was important to 'live through it' in order to develop this type of search specialism.

Sometimes the search for records involved dynamic remembering that spanned multiple departments. One worker described the problem: "there's lots of, … information that resides throughout the organization and not localized in CPIN" (Participant 51, personal communication, 27 March 2020). Another worker described the solution in relation to microfilm[21] of paper records:

> *if we don't have the microfilm electronic, I have to make a request to the [records] department who literally goes downstairs, pulls the microfilm out, and then pulls it through the machine, and that machine has software that*

[21] Microfilm is pictures of handwritten paper records.

> *takes, like, really good pictures of it and digitizes it and sends it off to me. (Participant 43, personal communication, 5 November 2019).*

The worker also mentioned that some of the migration from paper to microfilm was not done well, so it was illegible (Participant 43, personal communication, 5 November 2019). This is evidence that there was a compounding of data quality issues from migration, the history of which was only retained through intersubjective communication.

Understanding the meaning and history of data elements in England

In England, there were similar dynamic memories at play in terms of skills that facilitated the extraction and cleaning of data for predictive analytics projects. Agencies had different levels of skill around extracting data and explaining its meaning. Some performance data teams were accustomed to running pre-built routine reports and any queries that diverged from those reports had to be sent to IT, where they had the skills to run SQL queries, but not the skills to understand the meaning of the data extracts.

When piloting predictive analytics, some local authorities had a person with historical knowledge about how things were recorded previously and how that had changed over time (fieldnotes, 3 March 2020). One local authority had a person help the predictive analytics workers to understand the data: she “talked us through some of the data in [the local authority] and, … that was super, super helpful. She knew lots about, … the history about how data had been recorded, … partly because she’d been, … influential … in changing that.” (Participant 50, personal communication, 19 March 2020). Other agencies still had an experienced analyst look over the data extraction and send over a .csv file (fieldnotes, 3 March 2020). While this provided some assurance that it was accurate, transparency around data quality was more difficult when someone internal to the agency was doing this and they did not necessarily explain what they had done (fieldnotes, 3 March 2020). As noted previously, they could have altered the data in Excel after internal discussions and then sent a .csv, which would impact replicability (fieldnotes, 3 March 2020). Where extraction was sent to IT without the performance team’s involvement, there would be less assurance that

the data would be accurate and representative (fieldnotes, 3 March 2020). There were potential issues with static data where dynamic intersubjective interpretation of the data was missing.

In England, the importance of a person with historical understanding was made explicit through a comparison of local authorities. One person working on predictive analytics projects with multiple local authorities said that “one … local authority had … people … sat within the quality assurance function and … the head of that was at a senior level, … they used data, … much more in the sense of, … seeing it as a tool to improve the … quality of the service” (Participant 50, personal communication, 19 March 2020). This was contrasted with

> *the local authorities that had, … the performance management/business intelligences team, … sat there, and it’s more of, … a core function, … and, … back office. … at those local authorities the, … data was seen pretty much as … a thing to hit social workers over the head with and very much … data which … would potentially show you up, rather than … being a tool to be helpful and help you to reflect on how to improve. (Participant 50, personal communication, 19 March 2020)*

The dynamic remembering of static memory assets by different groups led to divergences in how data was interpreted and used.

These examples show how dynamic memory interacts with technology and extends our understanding of organizational memory beyond the static. They also highlight risks to organizational memory insofar as the intersubjective communication that ensures accurate understanding of how data from different technologies go together could get lost with turnover. Similarly, staff with the ability to explain the meaning of different data elements could influence the accuracy, reliability, relevance, and effectiveness of predictive analytics tools. Dynamic memory can vanish or change as patterns of communication evolve with technological developments.

6.3. Limitations of dynamic memory

This section looks at the explanatory limitations of dynamic memory relative to certain memory phenomena. The first example explores how front-line workers in Ontario struggled to find the narrative in CPIN, similar to the experience of workers in England in relation to the Integrated Children's System. The second example looks at how high-level narratives surrounding data integration in child protection could be false or misleading, or entirely different, depending on the interpretation. The third example looks at the conflicting narratives possible in fiasco analysis and what this tells us about the extent to which dynamic memory alone can help to understand the unintended consequences of information system change.

6.3.1. CPIN and narrative in Ontario

As mentioned earlier in the literature review and historical background chapters, front-line workers in England found their information systems to work against narrative. There was a similar experience with CPIN in Ontario. This section looks at how CPIN worked against workers' ability to maintain the dynamic narrative thread of their cases.

When looking at documentation, case notes were seen as more important than structured data when trying to understand 'the life of a case'. A worker explained, "sometimes when you get history from another child welfare agency, you don't get the case notes, right. So, … you see what they write, but you haven't seen the life of the case." (Participant 11, personal communication, 26 September 2018). One of the challenges workers expressed about CPIN was that information was fragmented and not chronological, unlike the narrative flow supported by their legacy systems (Participant 43, personal communication, 5 November 2019). One worker explained, "CPIN is very … piecemeal ... You don't really get a sense of any timelines. … it's very hard to piece it together." (Participant 4, personal communication, 20 September 2018). Another worker expressed a similar sentiment, saying, "it is not intuitive in terms of being able to read a story."

(Participant 38, personal communication, 4 November 2019). This was similar to the experience of such information systems for a UK worker in children's social care, who said "it's all chopped up – and ICS – it's a complete nightmare – impossible to find the story" (White et al. 2010, 412).

The structured data from check boxes were privileged over narrative. One worker said, "[w]e're used to showing our work in a narrative and this system is not a narrative-friendly system. It's a tick-like system." (Participant 9, personal communication, 2 October 2018). Another worker also shared this opinion, saying that they wished CPIN had "more of a narrative instead of a tick, tick, tick, tick, tick, 'did you do this?', 'do this'" (Participant 20, personal communication, 30 November 2018). Similarly, in England, a health visitor working with the Common Assessment Framework, an element of the information system reform, said that it "doesn't tell a story. It feels to me a bit like school exams. Multiple choice. You can tick the boxes with the right answer, but it really doesn't give you . . . the story" (Hall et al. 2010, 405–6). In general, workers preferred stories, saying they found it difficult to fit things in prescribed forms (Participant 20, personal communication, 30 November 2018). The database model behind the information system was trying to fix individuals, cases, and services in place and make them static, while workers sought to understand the dynamic trajectory of their clients. At the time of the research, there were no technologies in place to help Ontario workers analyze and convert static memory in the database into a more dynamic understanding of their cases.

With this lack of narrative within CPIN, workers preferred conversations and sharing stories. Workers were more confident when they could talk to a colleague who had worked with a family than with the written documentation. One worker said, "there's nothing better than talking to someone about … their impressions about the family. … nothing's better than a conversation" (Participant 29, personal communication, 18 April 2019). Similarly, in England there were concerns about turnover and conventions were in place that allowed

workers to get in touch with someone who had left, again, emphasizing the importance of conversation to retaining organizational memory (fieldnotes, 11 March 2020). Real-time intersubjective communication was also an important feature of dynamic memory for workers.

Management opinions of what constituted dynamic memory differed from front-line. One Director of Service said,

> *CPIN has helped the Agency to move away from storytelling (i.e. tell me what happened in the case) as was prone to be done under a paper based system or even using our legacy system to a place where we now can ask and understand more contextual factors underlying a child protection case (i.e. help me understand what happened). This is because in CPIN, info is readily accessible and, for the experienced, easy to navigate. You can quickly get into the details of a case to know what happened thus enabling discussion around context and nuances. CPIN gives a broad snapshot of the case...what has been done vs. the old way of trying to piece together all that happened within a case. (Participant 51, correspondence, 29 June 2020)*

While workers wanted storytelling, management wanted to quickly understand the salient features of a case and took dynamic memory to be discussion of the contextual factors that gave a broad snapshot of a case. There were different perceptions of dynamic memory according to the professional context.

The fact remained that workers were experiencing difficulties integrating the technology into their practice, with one worker saying “that’s the whole piece of us struggling with how is technology gonna fit in, like more of a puzzle piece” (Participant 9, personal communication, 26 September 2018). Another worker provided an example of the lack of fit, complaining that CPIN lacked a ‘yes, but’ question answer. For this worker, the forms did not allow for nuance (for example if a client had recovered from a substance abuse issue and had been sober for many years), one worker described how “I still have to check off ‘yes’ to that, which, again, can completely skew the results or the perception of a case, when, like I said, you don’t get to say, ‘yes, but’. [laughter] ‘Yes, but that was fifteen years ago’, right.” (Participant 13, personal communication, 5 October 2018). Workers could not understand

how the requirement to record static features could do justice to the dynamic progress they saw in their cases.

One reason for this resistance was inertia relative to the old ways of doing things in the absence of compelling technological replacement or enhancement. One worker said, “I miss the old days of opening a file … and you could get a snapshot of what’s been going on with the family” because with CPIN, “I don’t think it gives you a great snapshot of what [the client’s] got going on” (Participant 20, personal communication, 30 November 2018). The worker went on to ask “what’ll it be like in twenty years from now … are they gonna get a sense … I don’t know. … I’d be curious because … I like the old stuff, I like the narrative. … just, it’s almost gone” (Participant 20, personal communication, 30 November 2018). Existing ways of drawing on dynamic memory through narrative case notes, or intersubjective conversations had not been supplanted for front-line workers by the new technology. It was not able to convert static features recorded in the database into a meaningful dynamic memory of their clients and cases.

Workers also felt that an administrative focus by the ministry on recording compliance was limiting dynamic memory about the progression of a client’s case. Specifically, workers felt that client and professional case narratives were secondary to the administrative narrative about compliance with standards. One worker explained,

> *I understand standards have to be kept, … just, it’s frustrating when what we get back is these quarterly reports, … the ministry came and, ‘you didn’t do this, and you didn’t do this’, and I was so frustrated, I was like, ‘know what I did do? I did see the child and … I did support that provider, and I did, and I did, and I did’, but the ministry’s just looking at did you see the child privately in the first seven days. (Participant 20, personal communication, 30 November 2018)*

The limitation here is that ministry staff were not concerned about the narrative. They were concerned to see if the recording had been done properly, such that it reflects compliance with standards:

> *If you miss a departure … ticky box …, let’s say, for example, investigation safety assessment, … it will come up in an audit saying that you didn’t do the departure, even though the information is actually in the narrative body.*

> *They're only looking at the ticky boxes. … 'cause people doing the audits don't read the actual, … narrative. (Participant 58, personal communication, 27 August 2020)*

Here, there are different stories: social work is more interested in how clients are doing. Public administration is more interested in how compliant services are. The type and value of dynamic memory differs because people in different parts of this organizational space can impose their memory demands on others (in these examples, those responsible for the information system, ministry officials, can impose their memory demands on users).

Worker concerns about information technology were eventually taken more seriously in England. In a progress report by Laming after the death of Baby P, the Integrated Children's System was found to be problematic because professional practice and judgement were

> *being compromised by an over-complicated, lengthy and tick-box assessment and recording system. The direct interaction and engagement with children and their families, which is at the core of social work, is said to be at risk as the needs of a work management tool overtake those of evidence-based assessment, sound analysis and professional judgement about risk of harm. (Laming 2009, 32–33)*

The recommendation was that the utility of the Integrated Children's System (ICS) should be improved for social workers "to be effective in supporting them in their role and their contact with children and families, partners, services and courts, and to ensure appropriate transfer of essential information across organisational boundaries" (Laming 2009, 86). Narratives associated with management oversight had taken precedence over client and professional narratives of outcomes, expert judgement, and discretion. This suggests that there are divergent dynamic memories grounded in forms of background memory that shaped the narratives and the perceived user friendliness of tools.

6.3.2. Divergent interpretations of data integration

In both Ontario and England, there were three kinds of data integration suggested by inquests that were conflated in subsequent information system implementations, typically resulting in one type of integration being selected and the others being ignored. The three

types were temporal integration where records from historical systems should be brought forward into new information systems; and two types of spatial integration, where records should be available across different child protection agencies serving different regions, and where records from different service sectors (like health, education, other social services, and housing) should be available to child protection workers. The narratives always referred to integrating across agencies, but never specified exactly what was meant, allowing for a divergence between the problem and the solutions, as the recommendations were dynamically interpreted.

Typically, the divergence was observed in practice, without any evidence of this divergence in the language of the narrative. Ontario focused on spatial integration between child protection agencies serving different regions, but not with other sectors and not with historical records, despite inquests identifying historical search as a problem (OCC 2014). England focused on spatial integration across service sectors but not across agencies serving different regions (Laming 2003), and temporal integration was a local decision when migrating to new systems (fieldnotes, 3 March and 14 May 2020). Narratives evolved and changed to the point where they no longer reflected the reality of what had happened or what was needed. In this way, dynamic memory can obfuscate through a selective remembering of past events. The following two subsections will look at the divergence between problem and solution narratives around data integration in Ontario and England.

Inter-agency or temporal data integration in Ontario

In the Ontario Chief Coroner's JB inquest recommendations, the jury emphasized "the importance of having a single, integrated information network throughout the entire province" (OCC 2014, 7). While this statement is ambiguous as to the type of integration, the surrounding statements made this clear. The Coroner highlighted how some CAS witnesses "noted that when information was queried from the Fast Track system, or when checking on specific system, critical information stored on the other systems was not readily available"

(OCC 2014, 7) and made a specific recommendation to the ministry that they “fund the migration of all information recorded on the older systems to CPIN.” (OCC 2014, 7).

In the ministry’s statements on CPIN, they specified that “[i]t will allow children’s aid societies to securely share with one another confidential child protection information and better manage case files and finances.” (MCYS 2016a) and that “[t]hey will be able to track what protection services children have received and the results, regardless of where in Ontario services were provided.” (MCYS 2016a). Here the emphasis appeared to be integration across agencies.

Once CPIN was implemented, the ministry described it as,

> *providing children's aid societies with the ability to access information about children who have received services using a single case file for a child. No matter where that child lives or moves to in Ontario, child protection workers can access previous case history and service plans, without needing to ask children to re-tell their stories unnecessarily. (Ontario 2021).*

The focus in these statements was on information integration across CASs. However, they also suggest that all historical data would be present, as recommended by the Coroner in the JB inquest.

In contrast to the ministry’s perspective, respondents revealed that statements indicating that historical records from legacy systems would be universally available in CPIN were factually inaccurate, as not all historical records were migrated (Participant 1, personal communication, 24 August 2018). Only active cases were migrated, meaning that if a case reopened after migration, workers would need to remember to search their legacy systems (Participant 1, personal communication, 28 September 2018). Incomplete migration was made worse by the migration of low quality data and record duplication, which made searching for historical records more difficult, even though they were in CPIN (Participant 3, personal communication, 6 September 2018; Participant 7, personal communication, 25 September 2018).

The incomplete migration was further worsened by agencies being left to make their own independent migration decisions, and each agency had to make compromises due to

insufficient time and resources for complete migration (Participant 7, personal communication, 3 October 2018; Participant 32, personal communication, 15 May 2019; Participant 43, personal communication, 5 November 2019). One worker explained how different migration decisions led to a system where a great deal of conversation remained necessary between workers. They said, “we have communicated to our staff numerous times, ‘you have to phone the other agency and see if they have everything on there. You can’t assume that’s full figured’” (Participant 27, personal communication, 18 March 2019). But, they went on to say that “that rarely happens because either people forget, right, you see the file, the case, you think the information’s there, or you, I guess, prioritize differently” (Participant 27, personal communication, 18 March 2019). This was further complicated by different recording conventions, and different record formats across different legacy systems (Participant 39, personal communication, 4 November 2019).

Legacy vendors supporting migration during the transition from their systems to CPIN and some workers questioned decisions not to migrate everything. One vendor said, “we asked questions during the process, ‘why would you not migrate this data?’ … ‘we don’t have time, we don’t have enough money’. It’s like, ‘… you don’t have enough money? You’re spending hundreds of millions of dollars across the board … and now you’re gonna ignore some key data that may inform a decision at a client level?’ … rather shocking.” (Participant 28, personal communication, 10 April 2019). A vendor attributed it to a lack of understanding of on-the-ground realities. The vendor explained, “my sense is that the people that were involved at the outset had come from more like banking system type of migration … I think the people who initially got onto the project had no clue how big this was and what they’d undertaken.” (Participant 28, personal communication, 10 April 2019). One worker shared this sentiment and elaborated, saying that “there might have been a lack of understanding of the implications of not migrating some of this legacy data into the system. … for CPIN to be the source of truth for all of history, it can’t be that now because of the ability to map that

data into CPIN … wasn't achieved" (Participant 35, personal communication, 6 August 2019). Migration was inconsistent and incomplete, which meant that CPIN was not temporally integrated and could not be considered the single source of truth.

The integration choices made during migration also had an influence on analysis and outcomes measurement. The incomplete migration created a break with the past in terms of analysis. Where closed cases were uploaded to CPIN as PDFs rather than as cases with migrated data in the database, information was difficult to extract for analysis purposes (Participant 32, personal communication, 15 May 2019). The failure to temporally integrate was evidence of a disregard for the outcomes element of the policy narrative. As mentioned in the chapter on static memory, some agencies did not have links from legacy data to CPIN data and they had lost the ability to compare data over time, to translate static data into a dynamic narrative for front-line or strategic decision making (Participant 32, personal communication, 15 May 2019). Sector data analysis staff indicated that "although the talk was about outcomes, the fact that they didn't even migrate OnLAC into it is pretty clear to me … what they said and what's really in existence are two different things" (Participant 47, personal communication, 23 January 2020). This demonstrates clear differences and contradictions between the narratives surrounding information systems change and the reality of technology in use, suggesting that dynamic memory alone is also insufficient to explain how organizations remember things, especially given how these differences and contradictions can be observed.

While data integration was a priority and the JB inquest recommended full migration of files, this was not achieved in practice. Public claims of integration were based on the spatial integration of data across the regional boundaries of CASs. Dynamic memory can be false and misleading in relation to on-the-ground facts and realities. The next section will show how these findings were not unique to Ontario but also appeared in England.

Data integration within or between local authorities in England

This section explores similar narrative discrepancies between aspirations for digital change in the England and the reality of those changes on the ground. In the UK in the 2000s, there were calls to implement “a comprehensive management information system.” (Tribunal of Inquiry into Child Abuse in North Wales and Waterhouse 2000, 820). The government responded by proposing the Integrated Children’s System (Department of Health 2000a). This system reflected a means to deliver a holistic understanding of children’s needs, a coherent process, a common language, a single data entry system, and “data about individual children and families to be used for planning at individual and strategic levels.” (Department of Health 2000a, 1). Consultation events on the Integrated Children’s System highlighted “the need to share information between child welfare agencies” (Department of Health 2002). The sharing envisioned here is ambiguous. It could mean between agencies within a local authority or between child welfare agencies across local authorities. In practice, the focus has been within local authority boundaries.

Recommendations about information exchange in and among agencies were a key component of the Laming inquiry into the death of Victoria Climbié: “Improvements to the way information is exchanged within and between agencies are imperative if children are to be adequately safeguarded” (Laming 2003, 9). During the Laming inquiry, information sharing between Enfield, Haringey, Brent, and Ealing local authority social service departments was seen as one reason why Victoria Climbié’s case was allowed to fall through the cracks (Laming 2003). Despite these findings during Laming’s inquest, the recommendation was that there should be ‘only one electronic database’ within a local authority (Laming 2003, 375). The narrative emphasis was on sharing within local authority boundaries over sharing between local authorities, in spite of evidence in favour of both types. The only recommendation related to between local authority information sharing was that the confirmation of a case transfer should be recorded on the file (Laming 2003). The

government's response in Every Child Matters emphasized information integration within the local authority and that this information would be stored and accessed electronically in accordance with national data standards (HM Government 2003). Technological change was intended to enhance one type of dynamic memory through within-agency integration, though administratively the emphasis remained on compliance.

The narrative in England was focused on inter-agency information sharing within local authorities with less emphasis on ensuring history search. As a result, migration decisions were made at the local level. Some local authorities ensured all records were migrated when systems were changed, with one local authority migrating to a new system, matching field codes, where possible, and otherwise including some records as PDF attachments (generally paper and microfiche) (fieldnotes, 14 May 2020). Others were less concerned with migration of historical records from legacy systems into new systems, having only text referring to locations on legacy systems (fieldnotes, 3 March 2020).

At the time of the research, integration within local authorities was seen as the most important type of data integration (Dencik et al. 2018), though not all agencies were able to successfully integrate their data because of interoperability issues between information systems in different service sectors (Ofsted 2018). One person working on predictive analytics with local authorities said that integrated data was too new to use, "we've actually not used data off of those integrated combined systems because, … it's normally really, really new. We generally sort of need, you know, two, three years of historical data just to train our machine learning on that." (Participant 33, personal communication, 6 June 2019). A new memory infrastructure was being created, but it was too early to tell if it would enable greater intersubjective communication or if new technological tools would enhance dynamic memory.

Opinions about the need for extensive history and temporal integration were ambivalent between the two jurisdictions. Too much history was seen as a source of bias in

predictive analytics projects, specifically, past history (inter-generational) was not used because it was seen to contaminate the data with 'fruit of the forbidden tree' (fieldnotes, 24 June 2019). In Ontario, by contrast, the ability to trace involvement inter-generationally was seen as a means to shift the narrative around the problems, objectives, and potential solutions in child welfare: "because each person now … has a unique ID … number, so, can I track the multi-generational? Yes, of course, right. So, not just across the province, but … their kids, but when they become parents, we can see the pattern. … So, that would tell a better story in terms of whether we're successful or not as a service" (Participant 3, personal communication, 6 September 2018). The type of dynamic remembering prioritized in an organizational setting, across agencies or over time, could influence how people within those settings interpret the value of different types of dynamic memory and the ways in which information technology is developed and used.

In both Ontario and England, there were narratives about data integration that did not align with on-the-ground realities either because different types of integration were pursued or ignored (spatial internal, spatial external, or temporal). The type of dynamic memory envisioned may limit other dynamic ways of remembering, for example across time or between different agencies, and this visioning activity may itself become part of a dynamic process of remembering, in this case, the type of data integration that is perceived and communicated as most valuable. The next section will look at examples of where narratives from different perspectives can conflict and be irreconcilable.

6.3.3. Beyond fiasco analysis: conflicting dynamic memories about technology and tragedy

One of the key limitations of the dynamic perspective has been raised by studies of fiasco analysis. During and after a policy fiasco, narratives conflict and can influence the interpretation of an event depending on the perspective from which it is assessed (Bovens and 't Hart 1996). Proponents suggest that "[t]he wisdom after the event trap makes one

aware of the limited validity of deterministic and monocausal explanations of the evolution of policy episodes, including policy fiascoes. When interpreted in terms of a slightly different historical, institutional, and political perspective, many policy 'fiascoes' could easily have turned out quite differently" (Bovens and 't Hart 1996, 9). The challenge is that fiasco analysis is always political (and different stakeholders with different interests will direct analysis towards a different level in order to seek excuse and deflect blame). The basic argument is that depending on the researcher's (or interpreter's) underlying assumptions, the assessment of a fiasco will be different. This may be a risk in trying to understand if organizational memory is worse in the digital age because

> *meaning-making about policy events may slip into myth-making if we forget that the initial judgements we form about events and policymakers are likely to take a narrow, contemporaneous and politically opportune time perspective. These initial judgements tend to guide the socially organized process of remembering and forgetting that we call history-making. The biases also imply that the same set of events can be assessed very differently, and legitimately so, from different cultural, spatial, and institutional positions (Bovens and 't Hart 1996, 47).*

This hints at at least one further limitation of the dynamic perspective and responds directly to Corbett et al.'s (2020) proposition, noted above, that dynamic memory imbues events with meaning through storytelling.

An example of this from the child protection sector is the reinterpretation of an English narrative shifting from an individual blame and compliance perspective to a systems perspective. This example is drawn from Eileen Munro's criticism of the Laming inquiry, where she argued that child death inquiries (like Climbié's) should focus more on systemic issues than blaming social workers. She pulled apart evidence in the Laming inquiry to show how a different interpretation would result in a different set of potential remedies (Munro 2005). This highlighted how the tools that social workers were expected to use were seen to replace skills and knowledge and create the latent conditions for error (Broadhurst et al. 2010). Munro held that "[a]ssessment frameworks, procedure manuals, decision-making instruments are all, like power drills and computers, designed to enhance workers'

performance, by augmenting or replacing the skills and knowledge in their heads." (Munro 2005, 376). The focus on identifying individual cognitive deficits and attributing blame led to a more micro-managerial approach to social work practice, where human discretion was replaced with tools and success was measured in terms of compliance with standards. The dynamic beliefs that had shaped some of the existing narratives in the UK included “a readiness, in high profile public inquiries into the death of a child, to focus on professional error without looking deeply enough into its causes” (Munro 2011, 6). Munro highlighted a mechanism that had been adopted to reduce human error, which was "to limit the scope for fallible individual actions by replacing humans with tools as far as possible and giving them detailed instruction manuals for the tasks they still have to do. This has happened on a large scale in child protection." (Munro 2005, 379).

This replacement of humans with tools deskilled workers and placed greater emphasis on managerialism, compliance with standards, and performance indicators (Munro 2005). In terms of managerialism, a system of

> *performance targets set by government, and a complex set of information-processing tools to record what work is being done … is not just a neutral mechanism monitoring that professionals are doing what they say they will do. It is increasingly dictating what professionals should do and how they should do it. (Munro 2005, 380)*

Perspectives that shape how problems are dynamically remembered can lead to alterations in the procedures and tools in an environment. This can influence practice. In terms of deskilling, “[r]isk assessment and decision-making instruments are increasingly being introduced to standardise practice and minimise the scope for individual professional judgement” (Munro 2005, 379). Such deskilling risks accelerating with the introduction of predictive analytics tools (Munro 2019; de Boer and Raaphorst 2021). Some respondents working in the US have suggested that even before digitization, paper risk assessments had deskilled child protection workers, leading these respondents to believe that predictive analytics was the only solution to improved accuracy, as there was no professional expertise remaining for alternative technological tools to enhance (fieldnotes, 12 May 2021).

The examples that Munro described, related to training, resources, and organizational constraints, essentially represent latent conditions for error in the environment or world where social workers work (Broadhurst et al. 2010). By shifting from an approach focused on blame to a systemic approach,

> *[i]nstead of regarding human error as a satisfactory explanation of an accident and therefore concluding the investigation at that point, they treated it as the start of inquiry: why did the front line worker misread the dial, omit crucial steps in the procedures, or overlook signs of trouble? This led them to investigate the total system within which the person was operating so that they could better understand why the faulty action had looked the sensible thing to do at the time or why it might have been difficult for humans to perform well. (Munro 2005, 376)*

Munro's paper shows how evidence in the inquiry easily points to more systemic failings in the sector and how this evidence was overlooked in the analysis and conclusions. While dynamic memory can play a role in shaping how things are done, it can also be used to dissimulate, mask realities, or privilege certain interpretations over others.

One CAS staff member in Ontario shared a similar story of discrepant interpretations summarizing the differences between ministry and agency narratives of information system success:

> *I wanted to come back to that thing about the stories people told, … they're actually truthful, but they were a complete mismatch … the Deputy Minister thought that CPIN was a smashing success, and then she talked to somebody who is aware with this duplicate issue, who informed her, like, 'are you kidding?', … it actually was reconcilable, … if you look at the implementation of CPIN as successfully bringing 36 agencies onto a single platform, … and was done within budget, roughly on time. That's a huge success. You talk to a worker and says, 'oh my God. I've lost data again for the fourth time, … and it's constantly going down, and it's not reliable and, buh-buh-buh, and all these issues. It's a huge failure. Both are true. It depends on your perspective. (Participant 44, personal communication, 8 November 2019)*

Dynamic memory is prone to divergent interpretations by different organizational members depending on their positions, interests, and objectives. The risk is that dynamic memory will always be perspectival, with those holding decision-making authority able to alter the work environment and influence changes in practice, but this concern suggests that there might be additional forms of memory operating behind these perspectives.

6.4. Indication of other underlying forms of organizational memory

This section revisits passages we have already seen to illustrate how some of the phenomena indicate other forms of memory. It shows how there appear to be memory phenomena that do not fit under the rubric of static or dynamic memory. We will look at three types of examples: the first is around institutionalization and categorical thinking; the second is around the place of technological tools; and the third is around lived experience and understanding of the practical contexts of others. These examples suggest that there are forms of memory that operate behind the explicit instantiations (of static and dynamic) that we have explored so far.

First, there appear to be conceptual frameworks that operate in the background and that are not explicit. Proponents of dynamic memory have attempted to describe institutionalization as embedded narrative to try and retain it within the scope of dynamic memory (Corbett et al. 2020), and critics of static memory have suggested that databases are evidence of categorical thinking (Parton 2006). These phenomena have characteristics that make them distinct from static and dynamic memory. Institutionalization, for example, is seen as at risk of persisting despite the loss or forgetting of its ‘why story’ (Stark 2019). Categorical thinking seems to precede and structure the collection of static memory. For example, workers found it difficult to fit things in prescribed forms; one worker said this occurs “when I meet with caregivers and they tell me their story and I’m trying to fit it in things” (Participant 20, personal communication, 30 November 2018). There is a structure, or conceptual framework, guiding what is remembered and how we think about things that is independent of dynamic memory. This appears to represent a distinct form of memory, different from static and dynamic.

Second, there seem to be aspects of tool use that are not explicit. As we saw when looking at the technology in use, a major concern was how the technology was going to fit in. We saw how many technologies, as designed, created unease and confusion among

workers: “that’s the whole piece of us struggling with how is technology gonna fit in” (Participant 9, personal communication, 26 September 2018). We also saw how different designs that privileged narrative were seen as more useful for workers: “We’re used to showing our work in a narrative and this system is not a narrative-friendly system. It’s a tick-like system.” (Participant 9, personal communication, 2 October 2018). In addition to the categories and procedures that can become embedded in an information system, the design of the tools also appears to play a role in their acceptability to different groups, suggesting that the equipment that people use also represents a form of memory distinct from static and dynamic memory.

Third, there seem to be aspects of identity, practice, and worldview that are not explicit. As we saw from descriptions of the people involved in technological change, there were times where having, or failing to have, the experience of on the ground realities impacted the progress of technological change in child protection. We heard about the value of living through the technological changes: “I think you have to live through it because … every five years they changed things, right” (Participant 1, personal communication, 24 August 2018). There is something about living through it that precedes any narrative storytelling. We have also seen how a lack of understanding of the child protection service context could have negatively impacted the technological product that administrators delivered, where one worker said “my sense is that the people that were involved at the outset had come from more like banking system type of migration … I think the people who initially got onto the project had no clue how big this was and what they’d undertaken.” (Participant 28, personal communication, 10 April 2019); and another said “there might have been a lack of understanding of the implications of not migrating some of this legacy data into the system. … for CPIN to be the source of truth for all of history, it can’t be that now because of the ability to map that data into CPIN … wasn’t achieved” (Participant 35,

personal communication, 6 August 2019). This practical contextual experience within a social world is also neither a record nor a story.

These examples represent gaps in the scope of static and dynamic memory and their inability to account for some types of memory phenomena in this public administration setting. Organizational memory is not just data and representation or interpersonal communication that depends on assumptions of human cognition and information processing. It also includes phenomena operating in the background that are largely taken for granted but that make data and communication possible and meaningful.

6.5. Concluding statement

This chapter looked at the definition, areas of applicability, limitations, and gaps of dynamic memory. As we saw, dynamic memory is essentially inter-agential communication. The chapter presented areas of applicability through examples of workers and teams sharing stories about how to search for history using the suite of existing and legacy information technology in the organization to assist with interpretation, as well as by exploring technologies that better support dynamic understandings of cases and services. The chapter illustrated limitations and gaps by presenting examples of how memory could be utterly divorced from realities on the ground, for example how ambiguous terminology could hide nuanced understandings of ground-level realities and allow for those nuanced understandings to be forgotten in favour of the preferred interpretations of those with different perspectives. When thinking about data integration and availability, for example, it was important to note whether this meant within agencies, across providers from different sectors within one administrative region, across service providers of the same type but from different administrative regions, or across time in the migration of information from legacy systems to newer systems. This chapter also highlighted how different dynamic memories can compete when analyzing policy fiascoes (e.g., individual or systemic failings). We also saw how dynamic memory was unable to adequately explain some phenomena. For

example, it did not seem appropriate when thinking about concepts and categories that structure thought, the memory embedded in tools, and the practical contextual experience that guided what different people and groups prioritized in their work. These findings suggest that the way that institutional memory is conceived of may be ‘in need of a new story’ (Corbett et al. 2020, 60), but, as with all stories, this one has unstated assumptions in need of further interpretation.

Acknowledging that there is dynamic memory is important, and it does add to the static perspective; however, it also raises significant problems when suggested as the sole means to understand organizational memory. There appear to be other forms of memory operating in the background. These alternative forms of memory will be explored in the next chapter on tacit memory to see if this interpretation can fill out our understanding of how organizations remember in the digital age.

Chapter 7: Tacit memory

The preceding two chapters looked at two common ways in which memory is understood in organizations: as the static collection, storage, manipulation, retrieval, and processing of records, within the context of explicit rules and roles, and as the dynamic interpretation of information through inter-agential communication. However, static and dynamic memory did not seem to capture some more subtle types of memory that appeared to exist in the sector, like categorical thinking, the use of technological tools, and administrative or professional practices. Some underlying memory phenomena eluded explanation under the banners of static or dynamic. Drawing on Michael Polanyi's ideas about the tacit dimension of knowledge, the objective of this chapter is to give greater sense to the types of memory that underlie explicit instantiations and describe what this means in the context of digital change in a child protection setting. This chapter will provide an interpretation of tacit memory that will show the scope and limitations in the present perspectives and illustrate how tacit knowledge, while helpful for understanding certain memory phenomena, is again not sufficient to provide a complete understanding of memory in public sector organizations.

The chapter is structured as follows: the first section defines tacit memory as a form of memory operating in the background. The next section provides some illustrative examples of memory operating in the background of digital technology use in public child protection settings. Specifically, these examples look at (1) the conceptual frameworks behind interpretations of data elements, representation of case characteristics, and

understanding how to navigate an information system; (2) how embodied tool use manifests in the search for meaningful connections and learning by doing, but breaks down when expectations are not met; and (3) how the practical performance of skills involves socialization into an identity that can come into conflict with other technologically mediated worldviews. The next section illustrates that if tacit memory were to perfectly mirror Polanyi's concept of tacit knowledge, then it would be conflating three separate memory phenomena. This chapter concludes with an intimation as to how new forms of memory emerge from the idea of a tacit dimension, but requires a shift from memory as knowledge to memory as being. This further elaboration will be presented in the second part of this thesis.

7.1. Definition of tacit memory

As seen in the literature review, tacit memory focuses on the conceptual frameworks operating behind dynamic remembering and the interpretation of static memory. Tacit memory is not specifiable, but is the basis for explicit forms of memory. It represents structures that shape cognition, how we think, and what we can be said to know. It is seen as the organizational parallel of a non-declarative memory system in neural science and cognitive psychology (Meyer and Sugiyama 2007), but is primarily grounded in the aligned concept of tacit knowledge. Further, during periods of breakdown, we should be able to reflect on elements of this tacit memory by bringing them to focal attention. In parallel with Polanyi's idea of tacit knowledge, we would assume this type of memory may include assimilated frameworks, embodied tool use, and know-how. However, given the commitments implicit in the discussion of tacit knowledge (for example cognition, information processing, and mental models), tool use and know-how may represent different forms of memory.

7.2. Evidence of tacit memory: examples from the research data

This section presents examples from the research data that align with the three phenomena that Polanyi categorized as representing tacit knowledge and will illustrate the

types of memory at play. To facilitate the analysis of these examples, they will be separated into the three groupings of 1) conceptual frameworks, 2) the embodied use of tools, and 3) practical performances of skill.

7.2.1. Conceptual frameworks

In one respect, tacit knowledge is seen as a type of embedded conceptual framework that allows us to make sense of our representations of experience. As we saw in the literature review, Polanyi suggested that we have assimilated frameworks that are made up of a subsidiary awareness of particulars derived from countless experiences that enable us to identify and make sense of specific types of phenomena and adapt to these new experiences. We would expect similar evidence of conceptual framework development and maintenance in the child protection sector. Some have been suggested by UK researchers looking at the impact of information technologies on the ways of thinking in child protection work, finding that, “[c]ategorical thinking, based on the binary either/or logic, dominates” (Parton 2006, 263). In child protection, changes in information technology highlight distinct forms of knowledge or ways of thinking about things (Parton 2006; T. M. Vogl 2020b).

In the child protection setting, as we saw in the previous chapter in the Behavioural Insights Team example, data scientists needed to go to front-line social workers to validate their topics derived from their structural topic models (Sanders et al. 2017). There were topics that algorithms were able to highlight that made sense to workers, but that workers otherwise might not have explicitly discussed as part of their work. The model finds patterns to which workers apply meaning stemming from their tacit knowledge. This represents a form of analysis bringing to focal attention what was previously of subsidiary awareness when analyzing cases. This suggests that workers have tacit memory of their preceding experience which acts in a subsidiary way when those workers are processing information related to a case. This also suggests that data processing technology may be able to identify and punctuate features of tacit memory that become embedded in the static memory they

consume, making those features available for dialogical interpretation (Tsoukas 2011). This also shows how the processing of ever more decompressed data can support meaningful interpretive interactions between individuals and technology, where the technology can highlight patterns or anomalies and individuals with the requisite expertise can interpret them (Dunleavy and Margetts 2023; Snow 2021).

The structural topic model example highlights how technology could serve to highlight features of tacit memory and make them available for interpretation, but there is no reason to believe that this would be limited to text inputs. It could extend to other data such as image or video. As noted in the literature review, digital technology has advanced to the point where data no longer needs to be dramatically compressed for storage (Dunleavy and Margetts 2023). This means that public agencies do not need to continue only encoding lossy data, like binaries and counts standing in for more complex phenomena, but could hold and analyze high definition videos. Child protection agencies do collect video interviews (fieldnotes, 5 October 2018), and some technology could assist with interpretation. However, this type of analysis would depend on the underlying information infrastructure, because in Ontario, CPIN includes file size limits that are too small to allow many videos to be uploaded, so they reside in separate local repositories (Participant 27, personal communication, 4 November 2019).

There is also the importance of language and interpretation: for example, the recording of whether a child was ‘seen’ (taken literally or meaning the worker actually did direct work with the child) was highly variable, as different people inputted data with different interpretations (fieldnotes, 11 March 2020) and there was found to be no consistent measurement (fieldnotes, 28 May 2020). One data scientist found that agencies had different interpretations of data fields, saying that “local authorities … do seem to interpret things in different ways” and that “the way in which data is recorded over time in the same local authority may change” (Participant 50, personal communication, 19 March 2020). This

suggests that there is a tacit dimension operating behind the interpretation of terms used for measurement. This implies that due to the subjective or personal elements of memory that compose background subsidiary awareness, data entry that is supposed to be standardized is not. Personal conceptual frameworks led to sense-giving in relation to identified topics and different interpretations of ambiguous standards.

Workers emphasized that they knew their cases, but were unable to articulate all that they knew in their recordings and worried about whether those recordings would be helpful to future workers. One worker said that, "it's not my issue now because … this is my case and I know what I'm doing. But, if somebody were to look at this in a few years from now, how do you get a good sense of what really went on with this young person in this home. … I don't know if the answer is that kind of a computer system[22]" (Participant 20, personal communication, 30 November 2018). This suggests that there is a subsidiary awareness within the person that may not be transferred with technology, data, and written records. Another worker shared this sentiment, saying that,

> *there's obviously a lot more value … talking to someone that met, touched, and … seen people, and made their own assessments … as good as you are at writing and leaving a legacy of good assessments or whatever, there's nothing better than talking to someone about … their impressions about the family. And, when they're not there anymore, you're completely relying on … written documentation, which … by standard should be enough, but … nothing's better than a conversation in my mind and when you lose that, … you lose a piece of … the puzzle, … an assessment piece, for sure, in terms of making future decisions. (Participant 29, personal communication, 18 April 2019)*

While this passage points to the importance of dynamic memory and the risks of turnover, it also suggests that experience becomes embedded in a worker that cannot be drawn out representationally. The 'impressions' of other workers were trusted, even if they could not convey all the subsidiary particulars of which they were aware by virtue of their experience working with families. One worker attempted to describe how they developed their subsidiary

[22] Referring to a structural topic model analyzing worker case notes.

awareness, which allowed them to form impressions about clients: “I’ve read so much, I’ve been here for so long, … I bury in and out of the files, … doing disclosure … I used to do lawsuits and … criminal record requests and go to court and present documents … It’s sometimes I think, ‘wow, like, these parents are not bad parents, … they just need help’” (Participant 1, personal communication, 24 August 2018). Over time, workers develop personal conceptual frameworks that help them with assessments but that cannot be articulated to other workers. This speaks to the limitations of exclusive reliance on recording and the role of tacit knowing.

Tacit memory was not limited to case work, but also to electronic documentation. Workers found that they needed a tacit understanding of CPIN, and some felt that trying to embed this tacit understanding was influencing the way they thought. In this case, tacit knowledge of the subsidiaries enabled navigation to focal objectives in the CPIN interface. With respect to navigation, one worker said of CPIN that “it requires it to become a bit of second nature for you in order to do it properly and unless you’re doing it every single day repetitively, then it becomes more comfortable. You forget that … you just know how to do it.” (Participant 9, personal communication, 2 October 2018). Another worker emphasized the need for a preceding understanding in order to navigate effectively, saying “[y]ou have to know where to go to get everything” (Participant 19, personal communication, 30 November 2018). Another worker shared the following opinion, citing the different levels of understanding between management and front-line workers, saying that “they supported the workers, and didn’t put the same onus on the supervisors, nor the branch managers, and they simply do not know the system the way the front-line workers know the system. … their support was … how to read their reports or whatever they needed to do in CPIN. It wasn’t how we did the front-line work in CPIN.” (Participant 19, personal communication, 20 November 2018). This caused issues because “until you’re actually working in the system,

… you're not gonna understand how it works, 'cause it's not intuitive" (Participant 19, personal communication, 20 November 2018).

This unintuitive design also suggested that the conceptual frameworks they had developed as social workers were coming into conflict with the conceptual frameworks that had informed the design of CPIN. One worker said, "we've had to be more IT people … since CPIN came in" (Participant 19, personal communication, 20 November 2018) and another said, "I'm not an IT person. I just wanna do social work." (Participant 21, personal communication, 20 November 2018). Another worker suggested that the focus was shifting from work with families towards increased documentation, saying that "we're kind of undoing the way we think" (Participant 16, personal communication, 7 December 2018). Workers lacked the conceptual framework of the designers and had to build up the background memory needed for navigation. This made them feel as if they had to be a different kind of person.

In this section, we looked at tacit memory as conceptual frameworks wherein interpretations of data elements, representation of case characteristics, and understanding how to navigate an information system all required some tacit conceptual framework. The next subsection will look at how working with tools may require something more than conceptual frameworks.

7.2.2. Embodied tool use

According to Polanyi, tools become extensions of our bodies as we use them in a subsidiary way to make sense of something of which we are focally aware (Polanyi 2015). As seen in the literature review, one of his examples is a blind person's stick, where, when the stick is working, the person is not focusing on the characteristics of the stick or the sensation of it coming into contact with things, but instead on the meaning, such as whether or not there is an obstacle that needs to be avoided. The characteristics of the stick and the sensations are subsidiary to the focal objective of safely navigating a space. Similar

examples were found in child protection, specifically with respect to the digital tools workers used to manage their cases. Effective tool use appeared to depend on a foundation of experience and conformity with expectations.

As seen in the previous chapter, in Manchester, dynamic genograms generated by IBM's iBase were used as tools to meet the service objectives of understanding involvement and interactions in a case (Henry 2016). Previously, workers would have done their searches manually, but iBase integrated the data and presented a visual representation of family relationships and trajectory through services. This changed practice insofar as "when a case lands now with the key worker, the first thing that they do, is look on iBase, to look at some of the activity that has happened around that family. Once they understand that, they can then direct their searches, their questions, to the right people" (Holme 2017). Engagement with the tool was happening on two levels: workers were relying on their tacit memory to interpret the dynamic genogram or select and seek search terms, potentially related to mental models or conceptual frameworks, but they also had an embodied way of engaging with the tool itself. Embodied engagement with genograms has been found in the use of creative genograms for family therapy (Huss and Kapulnik 2021). Using iBase enabled the worker to identify a "really complex thing that a key worker wouldn't necessarily have picked up on" (Holme 2017).

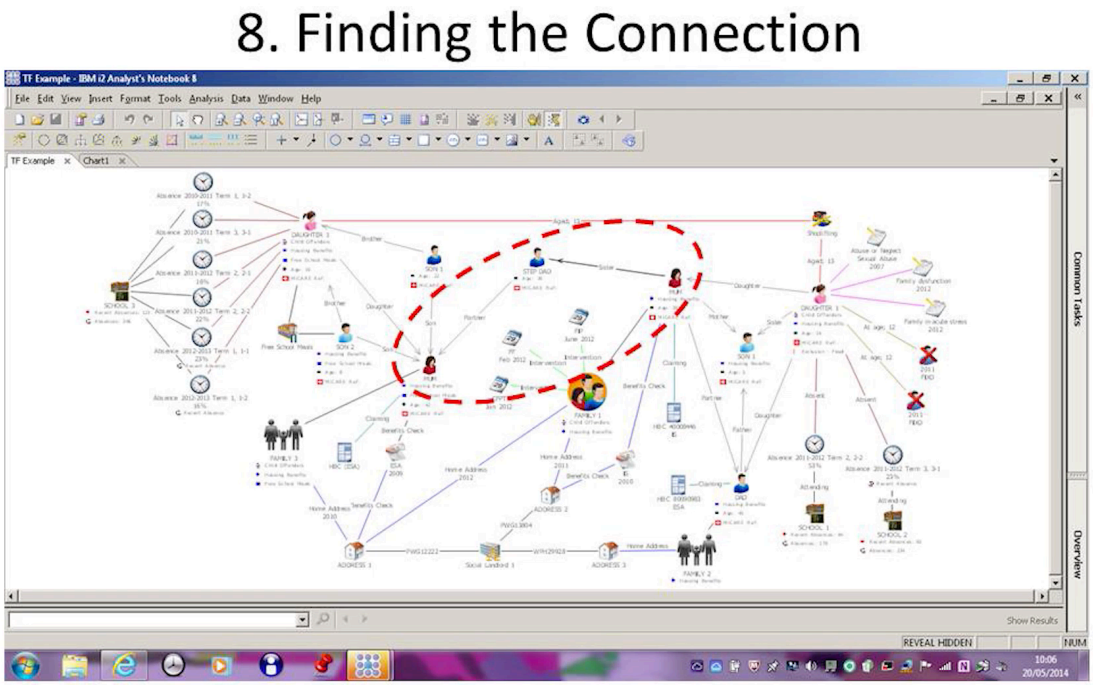


Figure 7: 'Finding the Connection' in Manchester's iBase (Holme 2017)

In figure 7 above, the dotted circle is not generated by iBase, but illustrates the connection the worker should be able to identify using the visualization, as well as, by extension, meaningful service interactions, risks, and obvious next steps. The particulars fade into the background relative to the objective of finding relevant connections between people and service involvement. While this may look like one thing, two things are happening in this example: one related to communication and the other related to action.

Learning to use a tool is best done through showing rather than telling and depends on continued use. Workers in Ontario mentioned that it was easier to show how the system worked than to explain it: "I think it's a really difficult system to explain to someone, if you're not actually visually in it, or looking, or navigating it" (Participant 9, personal communication, 2 October 2018). Also, analysts had access to Cognos as part of CPIN to do data reports. However, when not used frequently, it was easy to forget how to use the interface: "if I'm not using it all the time, I don't remember … how I had used it … And then, I'm … running around, looking at … the training documents … trying to remember … how to do certain

things” (Participant 4, personal communication, 20 September 2018). This shows the importance of ‘doing it’, rather than simply ‘explaining it’.

Instances of breakdown that occur because of misalignments between information system functionality and worker expectations can also highlight the embodied nature of tool use. For example, the inability to easily switch between cases and keep work from those cases open interfered with the flow of everyday work. Workers are interrupted throughout the day as one case takes precedence over another, and they need to easily switch between them. CPIN did not have the affordances to allow for this. Instead, “you have to physically save and exit in order to get out of that to move into something else” (Participant 13, personal communication, 26 September 2018).

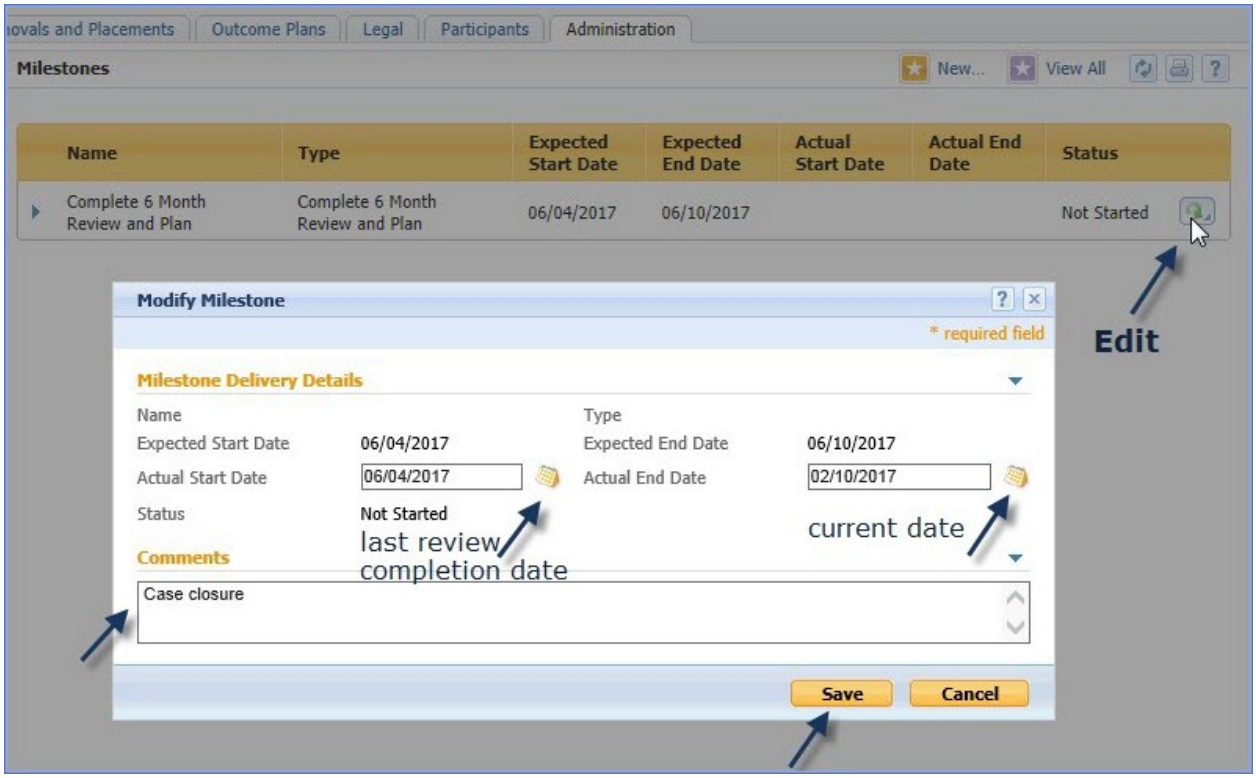


Figure 8: Closing a milestone in CPIN (from guidance document)

Figure 8 shows how one would close a milestone in an ongoing case in CPIN. It illustrates how a pop-up locks out other activities in the interface. It was drawn from an internal guidance document that was shared by Participant 50 on 29 June 2020.

Figure 8 above shows how sometimes the interface became locked (greyed-out) while a worker was completing case notes in a pop-up window. A worker could save and exit, but

the system locked records after 24 hours, so if they forgot or were unable to return to that file within the time limit, then their recording would be incomplete (Participant 13, personal communication, 5 October 2018; Participant 18, personal communication, 31 October 2018; Participant 20, personal communication, 30 November 2018). In Polanyi's terms, particulars of the information system, specifically things workers found frustrating, were coming into focal awareness, as evidenced by their discussion of them and presence to mind, which prevented them from simply completing the task at hand. Workers could conceptually understand what was happening, but their activity was interrupted.

7.2.3. The ability to practically perform skills

Polanyi also describes the process of developing a skill as a type of tacit knowledge and highlights how this occurs through the accumulation of practical experience. Polanyi says that,

> *[c]onnoisseurship, like skill, can be communicated only by example, not by precept. To become an expert wine-taster, to acquire a knowledge of innumerable different blends of tea or to be trained as a medical diagnostician, you must go through a long course of experience under the guidance of a master. (Polanyi 2015, 54)*

This tacit basis for expertise is emphasized as being not just about knowing, but also doing, with Polanyi explicitly stating in an example that "[t]he medical diagnostician's skill is as much an art of doing as it is an art of knowing." (Polanyi 2015, 54). This section will look at some examples of skill development and performance in child protection.

Research participants indicated that becoming a child protection worker required on the job experience. Some suggested that learning child protection work took time, mentorship, and training within the CAS organization (Participants 9, 10, 11, 12, and 13, personal communication, 26 September 2018). One worker described how initially they had to learn on the job, but how the agency subsequently shifted towards more structured, but still experiential, learning: "the learning kind of shifted in that I think there was more a focus in the agency on how to mentor and kind of slowly integrate you." (Participant 9, personal

communication, 26 September 2018). There were things that had to be embedded in subsidiary awareness to enable skilled and effective working. Expertise depended on practical experience, socialization, and being integrated into a particular identity.

This expertise was seen to be disrupted by CPIN and at risk of being replaced. The introduction of CPIN was accompanied by a shift in focus from clinical information needed by social workers towards administrative statistics. One worker described their experience of the change:

> *the … primary difference that I noticed is that the collection of information … became a little less clinical and a lot more rigid in terms of 'you must collect this information'. … and primarily it's information that's quite obvious that they can pull … analyze stats and demographics … and all these things, and less about the clinical piece of social work. (Participant 29, personal communication, 18 April 2019)*

Workers felt that the focus had shifted from doing good work to meeting administrative standards:

> *it becomes more about meeting those standards than … spending the time reviewing history, or speaking to previous workers, or whatever, to make determinations … a lot of people are more concerned that they're meeting the standards, rather than practicing good work, and I'm sure you know … in child protection what's applauded … is the numbers, … not the work and … CPIN is kind of a testament to that (Participant 29, personal communication, 18 April 2019)*

Agencies could try to incorporate more clinically relevant information into the system, but that type of record keeping could fall to the side relative to prioritized compliance requirements. For example, workers complained that auditors prioritized standards over clinical outcomes (Participant 29, personal communication, 18 April 2019). This shift in focus indicates that expertise and the practical performance of skills are tied to identity, suggesting that this memory may be more than the development of tacit rules based on the accumulation of experience.

This shift towards being more administrative led to changes in priorities. History search, for example, changed from being a part of clinical work to a piece of administrative compliance, where the focus was on finding potential records, rather than evaluating their

meaning or relevance to a case, with one worker saying the approach of the search team changed to "'okay, we did it', tick box, … 'here it is', rather than … the important piece of the history is that we make good decisions so that kids don't die. … It's become more, 'we completed a search' … in the most administrative way possible, with the hopes that this gets reviewed" (Participant 29, personal communication, 18 April 2019). These findings suggest that social worker identity was changing and this was, in part, driven by the technological tools they were given and the administrative standards that were embedded in them.

7.3. Limitations of tacit memory: subsuming too many phenomena

> *Thought can live only on grounds which we adopt in the service of a reality to which we submit. (Polanyi 1983, xi)*

This section looks at some limitations in Polanyi's idea of tacit knowledge as a means to make sense of the forms of memory operating in the background, specifically its conflation of the underlying phenomena behind conceptual frameworks, tool use, and practical performance. Drawing on evidence from the examples in the previous section and comparing them to examples that Polanyi himself provides, this section suggests that there is a meaningful distinction between the phenomena that Polanyi combines under the heading of tacit knowledge. The general issue is that Polanyi adopts a language of cognition, representation, and subject-object dualism to describe all three when a different vocabulary is needed to do justice to the underlying phenomena surrounding tool use and practical performance. This section suggests that these three phenomena should not be conflated under one category, but that tacit memory should be limited to the first phenomenon of assimilated conceptual frameworks, as that phenomenon is most closely tied to knowledge..

When trying to describe the phenomenon of tacit knowledge, Polanyi falls into the Cartesian tradition of using dualistic language that separates mind and body (Dreyfus 1991). He discusses particulars and wholes, which parallels discussions of subject/object epistemology (Dreyfus 1991). Take, for example, the following passage:

> *Because our body is involved in the perception of objects, it participates thereby in our knowing of all other things outside. Moreover, we keep expanding our body into the world, by assimilating to it sets of particulars which we integrate into reasonable entities. Thus do we form, intellectually and practically, an interpreted universe populated by entities, the particulars of which we have interiorized for the sake of comprehending their meaning in the shape of coherent entities. (Polanyi 1983, 29)*

There is a distinction between inside and outside, mind and body, subject and entities. While conceptual frameworks may very well be at play as workers bring their experience to bear on the interpretation of case details and the impressions they form, a different impetus might be at play with the memory behind tool use and expertise.

Polanyi makes some statements that gesture towards less epistemological and more ontological conceptions, specifically around dwelling, understanding, and ways of being; however, he continues to couch this discussion in the language of conceptual frameworks. Polanyi states that “knowing is an indwelling: that is, a utilization of a framework for unfolding our understanding in accordance with the indications and standards imposed by the framework.” (Polanyi 1969, 134). He tries to make a connection between knowing and being, stating that “[i]f an act of knowing affects our choice between alternative frameworks, or modifies the framework in which we dwell, it involves a change in our way of being.” (Polanyi 1969, 134). But he betrays his commitment to the Cartesian worldview through his restatement of Kant’s transcendental unity of apperception (Kant 1998): “Our formally declared beliefs can be held to be true in the last resort only because of our logically anterior acceptance of a particular set of terms, from which all our references to reality are constructed.” (Polanyi 2015, 286). The discussion of tacit knowledge centres on frameworks, rules, particulars, entities, and reality.

In terms of skill, there is a reduction of the phenomenon to rule-following: “the aim of a skilful performance is achieved by the observance of a set of rules which are not known as such to the person following them.” (Polanyi 2015, 49). He further emphasizes this point stating that, “the striving imagination has the power to implement its aim by the subsidiary practice of ingenious rules of which the subject remains focally ignorant.” (Polanyi 1969,

200). While there is a focus on the tacit and its role in subsidiary awareness, the language is still around objects or entities, particulars, and rules or frameworks. Polanyi attempts to go beyond Cartesian mind body dualism while continuing to use its language. In the end, he presents an idea of tacit knowing that is best suited to describe the underlying phenomenon behind representational or scientific knowledge, but he tries to extend this understanding into areas of skillful action. He conflates knowing with doing and assumes an equivalency in the 'tacit' dimension operating behind each. He states, "I regard knowing as an active comprehension of the things known, an action that requires skill. Skillful knowing and doing is performed by subordinating a set of particulars, as clues or tools, to the shaping of a skilful achievement, whether practical or theoretical." (Polanyi 2015, xxvii). There appears to be a conflation of knowing with doing and identity, but these phenomena might actually be different.

7.4. Indication of other forms of memory operating in the background

The phenomena operating behind 'doing' and identity may be very different than those behind knowing. Moving to a language of memory rather than knowledge can help to overcome this barrier. Embodied tool use and the practical performance of skill have a fundamentally different foundation than the rules, conceptual frameworks, and particulars Polanyi posits for tacit knowing. There is precedent for this type of distinction given the ideas of implicit memory that knowledge management explored (Meyer and Sugiyama 2007; Virtanen 2010). Further, Heidegger's ideas of ready-to-hand equipment and being-in-the-world offer an alternative to help make sense of these phenomena. Heidegger's philosophy shifts the focus from consciousness (epistemology) to existence (ontology) and in so doing offers a different way to understand embodied tool use and skillful action. Fundamentally, human beings are non-dualistic. Polanyi is trying to make sense of knowledge in terms of what Heidegger refers to as the present-at-hand, similar to Polanyi's focal awareness of entities or particulars, but Heidegger is dealing with a different ontological starting point,

arguing that ‘reality’ is a consequence of the Cartesian mind-body dualism perspective and is unique to present-at-hand being. Polanyi himself describes that he is concerned with knowledge and reality: “We can account for this capacity of ours to know more than we can tell if we believe in the presence of an external reality with which we can establish contact” (Polanyi 1969, 133). This passage is aiming towards embodied being in the world, but it falls short by preserving the language of mind-body dualism. Polanyi introduces the idea that there are phenomena operating in the background, but is constrained by the epistemological terminology that he operates within. In this way, Polanyi’s idea of tacit knowledge is distinct from what Heidegger means by equipment and being-in-the-world. Similarly, for Tsoukas, "[w]hen engaged in action, we cannot identify the subsidiary particulars that render our action possible. This has nothing to do with the speed of our mental operations, but is an ontological feature of skilled action. Our tacit knowledge of subsidiaries is rather manifested in our patterns of action" (Tsoukas 2011, 459). He suggests that tacit knowledge is an ontological feature of skilled action, rather than suggesting that skilled action is ontologically different than tacit knowledge. While there may be no ontological difference between tacit and explicit knowledge, tacit knowledge and tacit memory are not ontologically equipped to do justice to the memory phenomena of embodied tool use and skilled action.

As we saw from the examples in child protection, conceptual frameworks were applicable to some aspects of work in the field, specifically, making sense of data elements, the tacit dimension behind giving recording meaning, and learning the logical structure of the information system. In this regard, tacit memory offers a means to better understand some of the human elements influencing technological change in this setting. However, the examples of embodied tool use and skillful practical performance suggested that there was more to the phenomenon of organizational memory than representation, rules, and conceptual frameworks. Embodied tool use and practical skilled performance appear to operate on the organizational equivalents of different non-declarative memory systems. Activities are

directed towards something and, as noted earlier, are not true or false, but successful or unsuccessful, right or wrong. As seen in the case of child protection, understanding this requires more attention to objectives, feedback, expectations, experience, socialization, context, and values. This has implications for how we ought to understand memory and technology in organizations. A technology becomes not just something that influences efficiency, but that can impact the meaning of activity in a world. This extension of organizational memory into doing and being pushes the idea beyond its exclusive connection to knowledge and towards an ontological understanding of memory. However, if Weber is correct and "[b]ureaucratic administration means fundamentally domination through knowledge" (1968, 225), then types of memory that extend beyond knowledge represent areas of activity that are not as easily amenable to such organizational control. These implications for technology and public administration will be discussed in greater detail in subsequent chapters.

7.5. Concluding statement

This chapter looked at the role of tacit memory, its limitations, and the gaps left in our understanding of memory. Based on the examples presented, it should be evident that there is a tacit dimension. Building on the work of Polanyi, I suggest that tacit knowledge, and what I have referred to here as tacit memory, is just one of three elements of this 'tacit' dimension. I argue that tacit knowledge, and thus tacit memory, only represents subsidiary awareness that is related to instances where we are engaging in knowing activities, where knowing is characterized by separation of subject and object, where objects are understood in terms of particulars that describe them, and where we represent reality to one another.

Acknowledging that there is tacit memory is important, and it does add to the explicit memory perspectives; however, it also raises significant problems when it is used as the sole means to understand memory operating subsidiarily, or, more accurately, in the

background. It ignores the implicit[23] dimensions of memory. While tacit memory relates to thought, implicit memory relates to action and identity. The idea of tacit knowing subordinates ways of being to ways of knowing. According to Polanyi, we can know more than we can tell, but if we take Heidegger's ontology seriously, then we do and we are more than we can know. There are layers of inarticulable phenomena that we nevertheless have an interest in trying to better understand. In conclusion, this memory that operates in the background is not one thing (tacit memory), but three (tacit, implicit equipment, and implicit being-in-the-world).

[23] Here 'implicit' is understood from the neuroscience perspective of being more related to procedural/unconscious/non-declarative memory

Part II: Implicit memory

This part introduces two novel ways of understanding organizational memory with illustrative evidence from fieldwork in Ontario, building on some of the related examples in part I. It focuses on tool use (equipment) and practical performance of skills (being-in-the-world) and shows how Heidegger's ideas of fundamental ontology and the different ways of being can help to clarify forms of memory that have either been misidentified or only gesturally understood in the preceding literature. The intention is to helpfully expand our understanding of organizational memory such that we can solve the puzzles set out at the beginning of this thesis and better understand the unintended consequences of information system change in child protection.

In the previous part, explicit and tacit memory did not seem to capture some more subtle types of memory that existed in the sector. While the first part focuses on memory as what organizations know and how they know it, this part focuses on the more implicit dimensions of memory, specifically what organizations do (and by association what is done by the organizational actors inside them) and what organizations are (and by association the being of organizational actors).

The chapters in this part will look at how Heidegger's ideas about equipment and being-in-the-world grounded in fundamental ontology offer a means to make sense of the memory phenomena that were identified in the research and that are related to doing and being (Heidegger 1962; 1982). As noted in the literature review, Heidegger's contribution to this discussion is to suggest different modes of being. Specifically, Heidegger distinguishes

between the present-at-hand, the ready-to-hand, and being-in-the-world. The present-at-hand characterizes the Cartesian worldview which is at the core of knowledge claims in the Western tradition. The ready-to-hand is the embodied way that tools are used in the world to carry out everyday actions. Being-in-the-world is the stance a person takes on the world that helps guide their activity. The Cartesian assumption is that our basic way of relating to the world is representationally (Dreyfus 2007). However, Heidegger does not believe this:

> *He denies the traditional assumption that there must be a theory of every orderly domain – specifically that there can be a theory of the commonsense world. He insists we return to the phenomenon of everyday human activity and stop ringing changes on the traditional oppositions of immanent/transcendent, representation/represented, subject/object, as well as such oppositions within the subject as conscious/unconscious, explicit/tacit, reflective/unreflective. (Dreyfus 1991, 6)*

According to Dreyfus' interpretation,

> *Heidegger's important insight is not that, when we solve problems, we sometimes make use of representational equipment outside our bodies, but that being-in-the-world is more basic than thinking and solving problems; it is not representational at all. That is, when we are coping at our best, we are drawn in by solicitations and respond directly to them, so that the distinction between us and our equipment vanishes … in our most basic way of being—i.e. as skillful copers—we are not minds at all but one with the world. (Dreyfus 2007, 254–55)*

The aim in the following chapters is to look at the implicit forms of memory (equipment and being-in-the-world) through this basic, non-representational lens.

In a way, the division of this part into two chapters betrays the phenomenon, as it suggests there are two independent things we are dealing with. This has been an issue in information systems research, where the discussion has tended to separate the social and the material (Archer 1995; Mutch 2013). Some have tried to bring them together within existing ways of thinking (Orlikowski and Scott 2008; Leonardi 2013; S. V. Scott and Orlikowski 2013), but the analysis in this thesis adopts the stance taken by Riemer and Johnston about ontological inseparability (2017). The heuristic of separating equipment (material) and being (social), while artificial, is nonetheless useful when discussing the subtle differences in emphasis in the forms of memory associated with each.

Examples in this part will be limited to Ontario social workers using CPIN, because, as noted in the introduction and research design and methodology chapters, in-person observation in England was not possible due to restrictions on contact stemming from the COVID-19 pandemic response and in-person observation in Ontario with ministry staff was not permitted because after a change in government in June 2018, contacts in government indicated that they had shifted to a policy of not talking with anyone external, including about contracts with stakeholders (fieldnotes, 27 September 2019). In person observation was at the root of insights into background phenomena that could not be conveyed representationally through speech or text. During the COVID-19 pandemic, a worker at Ofsted in England indicated in a video call that local authority staff would be able to help me with advice about how to find information system guidance documents, should I need to do some work remotely, but said that I would lose how the information system is used in practice (for example, guidance may say go from screen A to screen B, but in practice workers may have found a workaround and go from screen A to screen C) (fieldnotes, 28 May 2020). This is comparable to findings in Ontario where different people would do things differently despite having relatively harmonized guidance. This comment helps to illustrate how having only document and interview data in England would have been insufficient to generate reliable insights on this form of memory. That being said, some evidence from England that has already been presented illustrates how similar phenomena could be at play and might be worth more in-depth research.

The first chapter in this part focuses on the tools that are used in child protection organizations in Ontario and how memory is embedded in them and their use. It proposes a form of memory behind tool use. The second chapter in this part foregoes discussion of culture or institutions and instead focuses on the different overlapping worlds that exist in organizational life, the memory they steward, and the ripples in identity they can experience

when a new piece of equipment is introduced. It proposes a form of memory at the foundation of professional being.

Chapter 8: Implicit memory related to equipment

This chapter looks at an implicit form of memory embedded in tool use. It focuses on how new tools introduced in the workplace not only change the way that information is recorded, but alter the ways in which work gets carried out. The way that workers work with their tools is a form of embodied memory that is not necessarily articulated, but that is made of experiences from the past that enable action in the present. In the next section of this chapter, examples are presented to highlight the five features of implicit memory in equipment. The subsequent section highlights some phenomena around child protection worker frustration, trauma, and disquiet stemming from the examples of tool use that hint at another form of implicit memory related to being-in-the-world. This chapter concludes with some thoughts about what this means for how we should understand memory and the implications of this understanding for making sense of the unintended consequences of technology projects in government.

8.1. Examples of memory in tool use

This section looks at situations where workers revealed implicit memory phenomena in tool use, specifically, as emphasized by breakdowns and frustrations with the CPIN information system and comparisons against legacy systems and latent technological expectations. In the instances of breakdown, CPIN was not acting as equipment, so features were not derived from the positive study of CPIN; instead, the features emerged from worker reflection on their frustrations and disappointment and what those negative sentiments implied about the features that they expected from their equipment. In terms of the ways of

being, the examples illustrate how an information system in use differs from an information system as an object of attention or as a receptacle of explicit memory. Based on the analysis of these breakdowns and frustrations, this section presents the five features of implicit memory in equipment: (1) the distinct ontology of tools in use, (2) the invisibility of tools in use and their visibility as objects during breakdown, (3) the relevance of context and other tools, (4) the goal-focused nature of tool use, and (5) the public nature of tools (insofar as they are available for anyone in their world to use and there is an appropriate or normal way to use them).

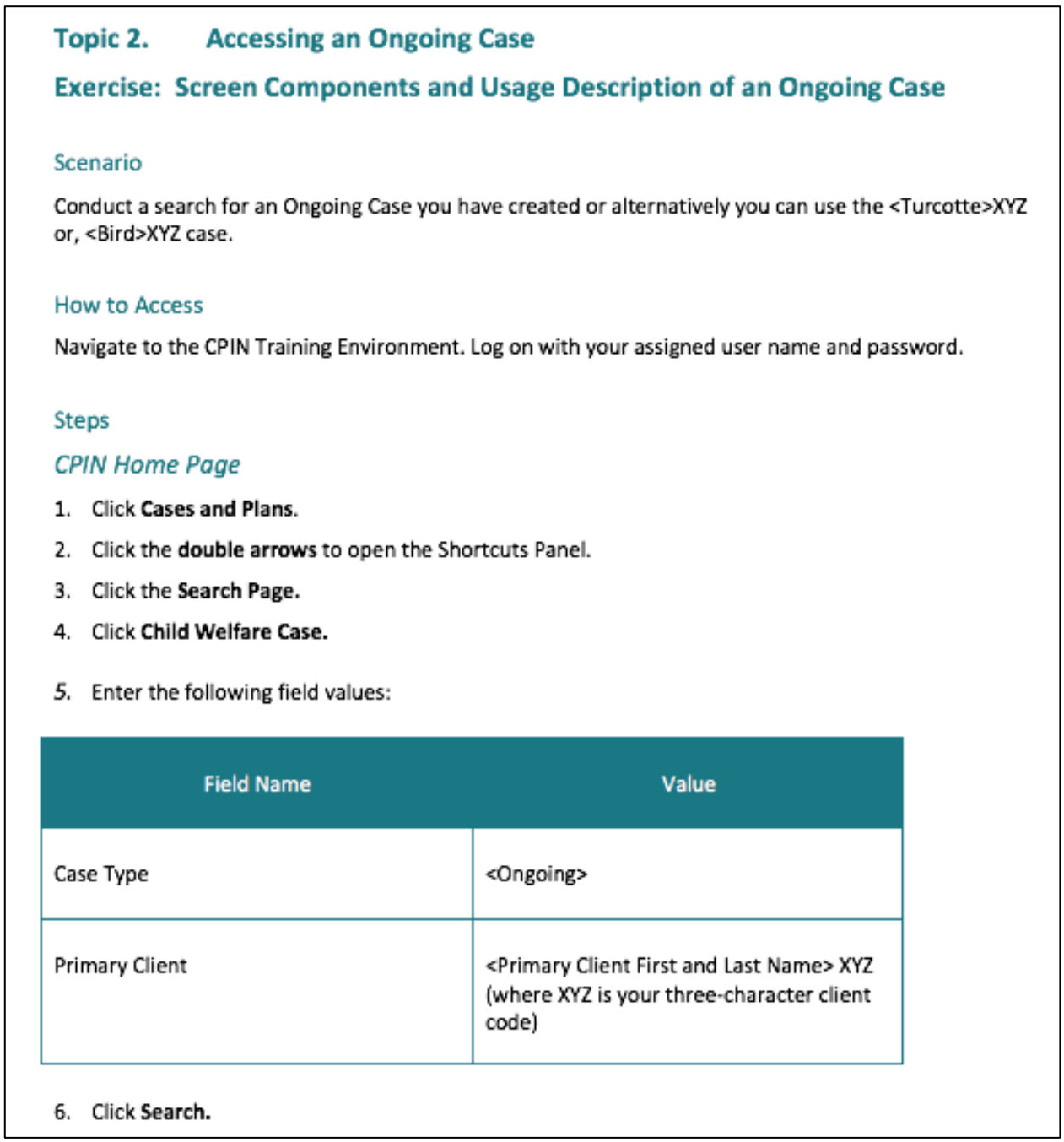
To help identify these features, many of the examples look at breakdowns in the everyday flow of practical activity as illustrated by problems the workers highlighted with CPIN. A breakdown is when a tool that is typically used transparently (i.e., without attending to its use, but instead to the goal of its use, with no reflection on the tool at all) comes to our attention because it is somehow interfering with our ability to achieve the goal, either by causing friction (the tool does not feel right) or directly blocking success (the tool breaks) (Star and Ruhleder 1996; Ackerman and Halverson 2004; Riemer and Johnston 2017). The ruptures caused by these breakdowns help to reveal the ways in which an unarticulated form of memory about how to do things is embedded in or disrupted by technology and technological change.

8.1.1. Tools in use have a different ontological status than tools as objects

The following examples are about how technology in use occupies a different ontological status than technology as an object of attention. These examples illustrate the difficulties in learning to use CPIN, the lack of immediate intuitiveness, the hyperlink structure that contributes to these issues, the implications for recording, and ultimately how, for some workers, the interface did not feel like it was designed for social work.

As seen in the tacit memory chapter, workers mentioned that when learning to use CPIN, it was easier to show how the system worked than to explain it. The action of ‘doing it’

in CPIN, was more helpful for teaching someone to use it than ‘explaining it’. Unfortunately, the ministry tended to provide textual guidance without screenshots of the interface for reference (see figures 9 and 10 below). There was a divergence between learning by doing and learning from guidance documents, suggesting that CPIN could occupy two ontological statuses, as a tool for doing things and as an object of analysis.



Topic 2. Accessing an Ongoing Case

Exercise: Screen Components and Usage Description of an Ongoing Case

Scenario

Conduct a search for an Ongoing Case you have created or alternatively you can use the <Turcotte>XYZ or, <Bird>XYZ case.

How to Access

Navigate to the CPIN Training Environment. Log on with your assigned user name and password.

Steps

CPIN Home Page

1. Click **Cases and Plans.**
2. Click the **double arrows** to open the Shortcuts Panel.
3. Click the **Search Page.**
4. Click **Child Welfare Case.**
5. Enter the following field values:

Field Name	Value
Case Type	<Ongoing>
Primary Client	<Primary Client First and Last Name> XYZ (where XYZ is your three-character client code)

6. Click **Search.**

Figure 9: Ministry guidance for accessing an ongoing case in CPIN

Figure 9 is from *Ongoing Management in CPIN: Participant Guide* (p.5), 16 July 2018, version 6 (Ontario 2018) shared by Participant 39 on 17 December 2019.

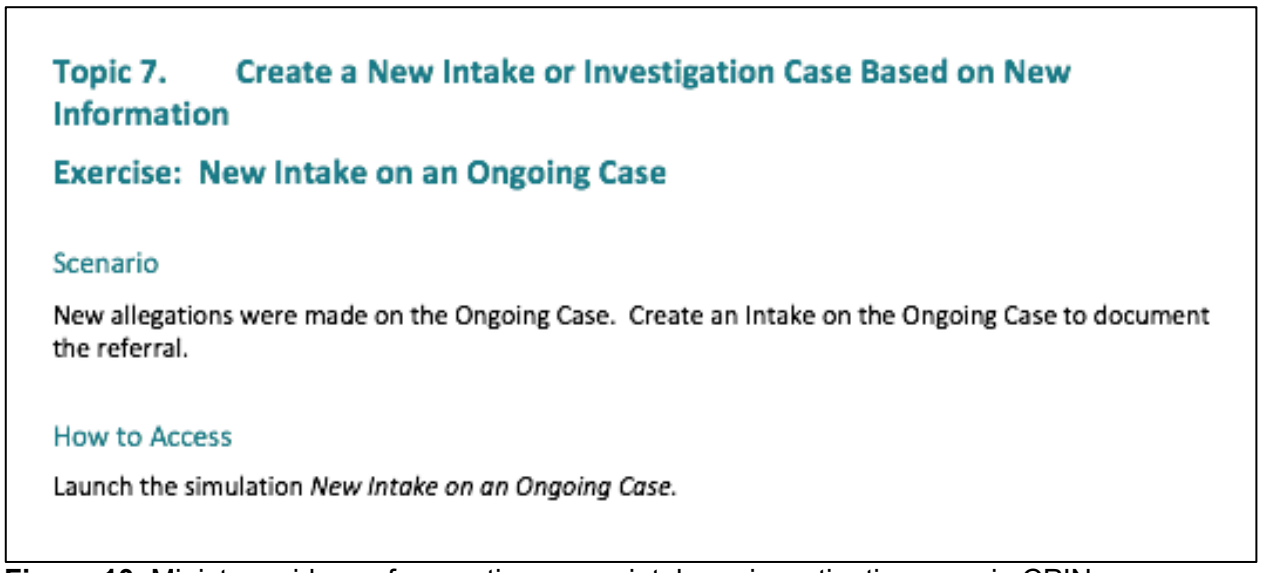


Figure 10: Ministry guidance for creating a new intake or investigation case in CPIN

Figure 10 is from *Ongoing Management in CPIN: Participant Guide* (p.37), 16 July 2018, version 6 (Ontario 2018) shared by Participant 39 on 17 December 2019.

Furthermore, training became out of date as CPIN changed. Not all agencies offered updated training and changes were communicated through email notifications that people largely ignored. One worker said,

> *[w]hat I can tell you is that over the years, whatever training was available or offered back in 2015, 2016, … it is largely different. A lot of the documentation practices have changed. A lot of the harmonized business practices have changed and … there's been a gap in training in the sense that staff were trained early on … at the implementation stage, but there hasn't been a follow through formal retraining … as CPIN has evolved (Participant 51, personal communication, 27 March 2020)*

Referring to email notifications about changes to CPIN recording expectations, this worker went on to say, "[t]hat's not really training. That's just letting you know that something has changed and that there's a different way of doing things" (Participant 51, personal communication, 27 March 2020). Workers were frustrated with constant changes to the system because they had to focus on learning the changes rather than doing social work. One worker said "'why don't you just give me something that works and let me do social work?', rather than me trying to figure out every two days … what's effective to use and what's not, 'cause I'm not gonna keep remembering … how to keep adapting" (Participant 21, personal communication, 3 January 2019). Change was communicated by the ministry,

but not understood, internalized, and embodied. One agency had carried out role-specific training to improve tool use and thus compliance rates: “they had rolled out … role-specific trainings … they came up with a very … targeted kind of training for each role. So, everybody knows very clearly across the agency what you need to tick, what you need to input so that it’s picking up” (Participant 53, personal communication, 27 August 2020). This agency focused on learning by doing, treating CPIN as a tool that needed to be normalized in use.

Whereas with previous systems, workers had found it intuitive to navigate the interface, with CPIN, this was not the case. One worker said, “the CPIN system, … it’s not a rational system to me, like, you have to know how to operate it to find where things are” (Participant 16, personal communication, 25 October 2018). Finding things was not always immediately intuitive for some workers. There were real implications related to the quality of recording in CPIN. Work was invisible in CPIN unless it was recorded correctly: “if you don’t tick the right boxes, then … it won’t read that you’ve been in compliance … you literally have to know what to click, what to do, where to add information, or else it’s like you never did it” (Participant 53, personal communication, 27 August 2020). Whether searching for information or doing recording, CPIN was not immediately intuitive and this brought it to workers’ attention as something that had to be known.

CPIN was difficult to navigate because it was all connected through unfamiliar hyperlinks: “you click on the hyperlink and then it hyperlinks back to that child and then if you want any of that information, you have to hyperlink into those things. So, the ones that you know what they do, they make sense, but there’s hyperlinks everywhere, so it’s really trial and error when you’re working in CPIN” (Participant 43, personal communication, 5 November 2019). This highlights a difference between technology as a tool that is familiar in use and technology as some object that the user has to think about when trying to figure out how to use it to do their work. Further, due to the hyperlinked structure, workers would do

what they could to avoid what some referred to as ‘CPIN shoulder’ (fieldnotes, 11 April 2019), which was upper body repetitive strain injuries resulting from the amount of mouse clicking (opening hyperlinks to find something and then going back and repeating on another hyperlink). One worker said, “it’s quite tedious to try to open a lot of contact logs and not really get a lot of information … out of it” (Participant 59, personal communication, 16 September 2020). The hyperlink structure was having bodily impacts which suggested that CPIN design did not fully consider the implications of tool use.

Some attributed this lack of focus on the tool in use to limited involvement of front-line practitioners in design and development of CPIN. One worker suggested there was insufficient user experience testing: “in the beginning … you could tell it wasn’t created with a lot of input from front-line staff” (Participant 58, personal communication, 27 August 2020). While the ministry had carried out ‘engagement’ activities (Participant 36, personal communication, 17 October 2019), there was also evidence that CPIN developers did not do any observational user experience testing: “if the developer of this system could actually see what it looks like front-line and how … instead of a focus group and seeing all the issues on a piece of paper, if they could see it in real time, what it looks like for front-line workers, I wonder if that would have an impact” (Participant 55, personal communication, 16 September 2020). Another worker shared this sentiment: “If they’d sit down and watch you input whatever your documentation is no matter what your role, I think it would be an eye-opener” (Participant 56, personal communication, 16 September 2020). One worker said, “I think a lot of what we’re trying to preach to them they don’t often always understand because they’re not on the ground working in it” (Participant 43, personal communication, 5 November 2019). Workers were distinguishing between issues as explicit representations and the implicit, practical experience of tools in use that could only be observed in practice. This suggests that there is a background memory about tool use that workers cannot effectively communicate to developers representationally. Developers may need to adopt

different user experience testing techniques to align new technologies with existing memories about how to use tools as equipment.

This data about navigation shows that there are things that do not seem intuitive about CPIN and normalizing these things constitutes a big learning curve. It also shows how ministry guidance (text documents with no visuals and emails) is insensitive to the preferred modes of learning of social workers. There is an intimation that CPIN can become equipment once learned, but that many aspects of it are disruptive, leading it to remain in a different mode of being, as an object of reflection. The relationship between memory and technology is that explicit memory communicated about a tool may not capture or align with the implicit memory setting the background expectations about how it would fit into practical activity. What this suggests is that the technology as a piece of everyday equipment has a different ontological status for the worker than the technology as an object that they have to think about. The memory embedded in tool use thus needs to be understood differently.

8.1.2. The transparency of tools in use and their visibility during breakdown

The following examples look at workers' struggles with recording, workflow, and history review in CPIN. The examples illustrate how CPIN became visible for workers and how those workers would have preferred a technology that got out of their way. They also show how workers tried to make the system recede into the background through workarounds or learning to make its use automatic, so that their work could flow.

Where recording expectations and the nature of the work diverged, there were breakdowns and CPIN became visible. Recording in CPIN was guided by the logic embedded in its specifications, which were not always transparent to social workers: "with CPIN, I feel that it expects you to be perfect. … it expects you to know what the computer is thinking. [inhale] … it is not a social worker friendly system. … it … has been … nightmarish. I see people at their desks crying as they've lost data" (Participant 58, personal communication, 16 September 2020). Workers were anthropomorphizing the information

system as an adversary because it disrupted their work and they were unfamiliar with the ways in which it expected things to be done. This made CPIN visible for these workers.

There were also limitations of CPIN relative to the nature of the work, for example having to do documentation before having established the identity of the client: “I think that can also create some roadblocks when we have files where we don’t know the name of the child yet. … it’s very difficult to document without a name to actually tie it to a real person.” (Participant 56, personal communication, 16 September 2020). With CPIN, identity verification and recording requirements were out of sync and the system became visible because it was not able to deal with cases with unclear identity. These frustrations made workers feel as if “we’re working for the program rather than the program working for us” (Participant 59, personal communication, 27 August 2020). For the workers, CPIN was visible as a tool that manages them in accordance with an idealized workflow, rather than a tool that helps them.

These problems that brought CPIN to workers' attention made them feel as if the system was not designed for them, and they repeatedly stated that it was not user friendly. One worker said, “the most unfriendly system is … CPIN … I can’t understand … how they can spend … millions of dollars with a program that is not friendly” (Participant 18, personal communication, 25 October 2018). One example of this unfriendliness was worker dismay at the lack of simple search assistance within the CPIN system: “we’ve been asking for a word search function … such as is in a simple Word document … for years, and … we haven’t gotten one yet” (Participant 59, personal communication, 27 August 2020). Another worker said, “you can buy an iPhone that does what it does … a Mac that does what it does so seamlessly and so easily … it boggles the imagination how a program that collects data can’t be made to be user-friendly, and … incorporate all of the stuff we’ve already said. … it’s a bit shameful and embarrassing that it’s not, but there it is.” (Participant 59, personal communication, 16 September 2020). Here user-friendliness was described as

seamlessness or ease of use. Everyday technology use has changed background expectations about technology in the workplace (Sørensen 2005). Reflecting on how CPIN was not available as a mobile application, one worker said, “I was in bed thinking, ‘why can’t I have this system on this phone?’ … we have CPIN, but … it’s still behind in terms of the technology and … how we can … use this to make our work easier.” (Participant 14, personal communication, 4 October 2018). People had become used to convenient and intuitive systems with no instructions, suggesting that there is an underlying conditioning, or memory, about how to use certain technological tools that changes as technologies in the environment change. This shift towards more intuitive systems could make people less able to deal with systems that are not intuitive and that need a manual.

Workers indicated that problems with the system could be resolved by improving the flow. One worker said, “I would make the system flow better.” (Participant 21, personal communication, 3 January 2019). Another worker shared the same opinion: “it’s easier when everything just kind of flows” (Participant 16, personal communication, 7 December 2018). And yet another worker put the problem in terms of flow when comparing case history review between CPIN and the legacy system: “there’s no flow. … I miss the old days of opening a file … and you could get a snapshot of what’s been going on” (Participant 20, personal communication, 30 November 2018). Not only did CPIN not reflect practice, but it did not help turn the mess of practice into an easily legible summary after the fact. Csikszentmihalyi has suggested that during flow “people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing" (Csikszentmihalyi 2008, 53). This reflects the idea that tools become invisible in use and it is the state that workers wanted from their technology.

Despite the challenges, workers wanted CPIN to work for them. To try and get CPIN to recede into the background, workers found workarounds: “I forget something in a

supervision note, I just write a new note, like, you know, an addendum or whatever, right" (Participant 41, personal communication, 5 November 2019). The addendum was intended to reflect a piece of missing information after the original log became locked. This was a workaround that allowed the work to continue without the need for reflective problem solving. Within the ready-to-hand, there is seamless flow and non-reflective coping. Workers sought to make CPIN less visible because "we're just trying to work through a problem to get through the task, because we have to move on to something else" (Participant 13, personal communication, 26 August 2018). Some workers wanted lasting changes to make the system more usable, but they found workarounds when they were told that change was not immediately possible: "we figure out Band-Aid ways to get around its … efficiencies … it's not a program that seems to be updatable in any way with … suggestions from the people who use it on a day-to-day basis. … we get told it's too expensive, or 'that's under development', or whatever" (Participant 59, personal communication, 16 September 2020). CPIN did adapt in certain cases and some common requests were built into CPIN, like adding the field 'closed in error' (Participant 41, personal communication, 5 November 2019). Workers sought to cope with CPIN, either through formal changes or workarounds.

In general, workarounds and requests for changes indicated that workers wanted CPIN use to become automatic. One worker, distinguishing between what required reflection and what was instinctive, said that they would have to think about which boxes to click in order to be compliant because "it's not all automatic yet" (Participant 41, personal communication, 5 November 2019). There was, however, an implied understanding that the use of CPIN would shift from being visible to invisible. When searching for and reading history, one worker said, "I feel like your brain wrestles with … 'what am I opening now?'" when thinking about their own practice, but that this may not be the case with another worker because "their brain's trained" (Participant 41, personal communication, 5 November 2019). This makes a distinction between a worker who struggles with CPIN and a worker whose

'brain is trained'. For some, the technology had become an invisible component of their practice.

When the rules for using CPIN were not automatic, the tool would be made visible to workers either when having to think about what to do, or when being made aware that they had made an error. As previously discussed in the chapter on dynamic memory, a worker expressed concerns about the ministry's focus on compliance with recording requirements and how whether boxes were checked correctly took precedence over whether the work was actually done[24]:

> *P20: I understand standards have to be kept … it's frustrating when what we get back is these quarterly reports … the ministry came and, 'you didn't do this, and you didn't do this, and you didn't do this', [laughter] [quietly] and I was so frustrated, I was like, [normal volume] 'you know what I did do? I did see the child and … I did support that provider, and I did, and I did, and I did', but the ministry's just looking at, 'but did you see the child privately within the first seven days?'*
>
> *TV: [laughter] Did you, did you record it?*
>
> *P20: Did I record it? Right. And did I record it properly. And … I take pride in doing good case work. I think we all do. And, if it doesn't get reflected there, it, [pause] you know. … the ministry's looking for, 'did you ticky box', well, I tried to ticky box, but*
>
> *TV: But the ticky box isn't, it doesn't necessarily help with that, sort of, exchange of information, or*
>
> *P20: No. It shows that I did what they asked me to do. (Participant 20, personal communication, 30 November 2018).*

Workers were being asked to focus on the things that made their work visible and legible to ministry administrators and in so doing, it was making the information system visible to them. The information system did not help the workers to meet their compliance requirements by following them in their fieldwork and automatically filling administrative fields. A new tool always enters pre-existing ways of doing things and if it does not attend to those things, then it will not fit.

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[24] In the following dialogue, the participant is abbreviated as P20 and I am abbreviated as TV.

These examples illustrate that there is implicit memory operating in the background about how to do things and it is conditioned by expectations embedded in existing equipment and those who use the equipment. Memory of how things are done allows equipment to fade into the background when it is working as expected. This data suggests that there were things about CPIN that brought it to the workers' attention. Not only did it make it difficult for them to record the information that they were expected to collect and that they would like to collect, but it destabilized their background understanding of social work practice, suggesting that CPIN intentionally or inadvertently embedded a different and foreign type of memory about the proper way to do the work. This prevented the information system from fading into the background and becoming invisible. As we saw in the examples, such as recording, workflow management, and history review, tools are seen as best when they get out of the way.

8.1.3. Tools in use and the relevance of context and other equipment

CPIN existed within a context of other tools that workers used to carry out their work, circumstances within which they worked, and existing practices that conditioned the ways in which those tools were used. This section describes the feature that tools are used in the context of other tools, conditions, and practices, which represent existing forms of experiential memory.

One of the primary areas where the importance of context and other tools was discussed was in comparisons with legacy systems. Some agency analysts were noticing how CPIN prevented them from doing things that they had been able to do before. One agency had been using their own full-featured version of Cognos business intelligence software before moving to CPIN, but after the transition they noticed that "it was the same system, Cognos, … but we had some restrictions … on using it" (Participant 31, personal communication, 2 May 2019). They also noticed that they no longer had access to a database schema to help with creating or changing a report: Previously, "we had … the

model, … how the tables are linked together. [However,] in the new system, … we don't" (Participant 31, personal communication, 2 May 2019). Finally, building on the example in the static memory chapter about a migration issue preventing agencies from linking OnLAC outcomes data between legacy system cases and CPIN cases (Participant 47, personal communication, 23 January 2020), this example also illustrates how CPIN was not attentive to the equipment and practices that preceded it.

At the front-line, CPIN was also used in the context of existing practices that were themselves conditioned by other tools, such as legacy systems, and their affordances. The following example shows how finding a clear summary of involvement was difficult in CPIN compared to the legacy systems that some agencies had used prior to CPIN. This comparison arose when a records administrator was searching for historical records about protection occurrences. The following dialogue occurred after some work on a summary letter was completed:

> *P43: what I was doing was writing a summary letter, which was just start going through cases and literally just making point form notes of the involvement, so that I could write up a summary. … I wasn't even doing that in CPIN because CPIN does not allow me to look at that information quickly and efficiently. I had to go back into our legacy system and look at it. [laughter]*
>
> *TV: And, why was that?*
>
> *P43: So, just because it's laid out so much better.*

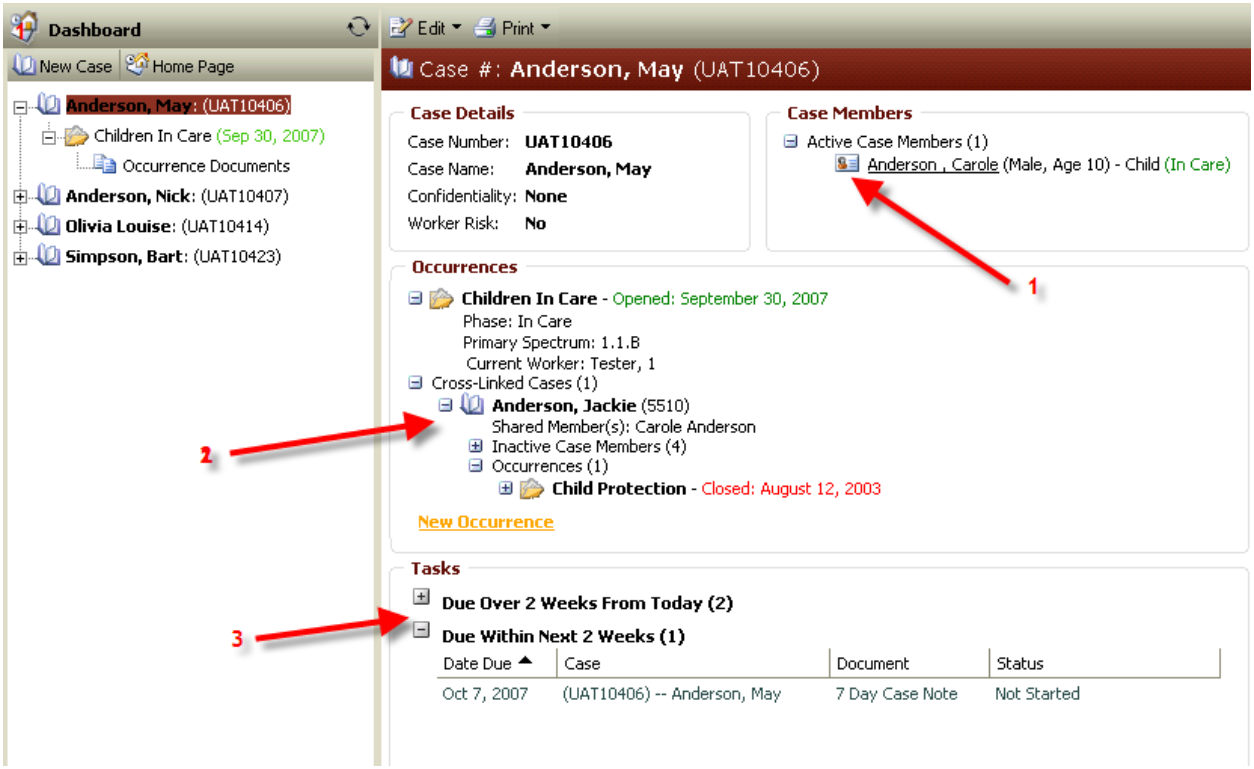


Figure 11: User interface for a case in the eForms legacy system

Figure 11 is a screenshot of a case in eForms. Under ‘Occurrences’ it shows the open date and the eligibility spectrum coding, which makes it easy for a worker to identify whether it was a protection concern. It also shows 1. case members, 2. cross-linked cases, and 3. tasks. This screenshot is from Coyote Software Corporation’s eForms training material (Coyote Software Corporation 2016, 5) and contains dummy data. The materials were shared by Participant 27 on 14 April 2019.

> *P43: I can see the open date. I can see the closed date. I can see that it was non-protection, so I don’t really need to care about that one because all my summary letter is is protection occurrences. So, it’s easy enough to see here that it’s protection. I can see the code is here, I can even know what the concerns were just looking at it right off the bat before opening it. (Participant 43, personal communication, 5 November 2019)*

In the eForms legacy system (figure 11), there is a clearly presented list of occurrences with dates and eligibility spectrum coding as well as relevant cross-linked cases. The worker does not need to open any files or follow any hyperlinks to gather the relevant summary information. Compare this with CPIN (figure 12).

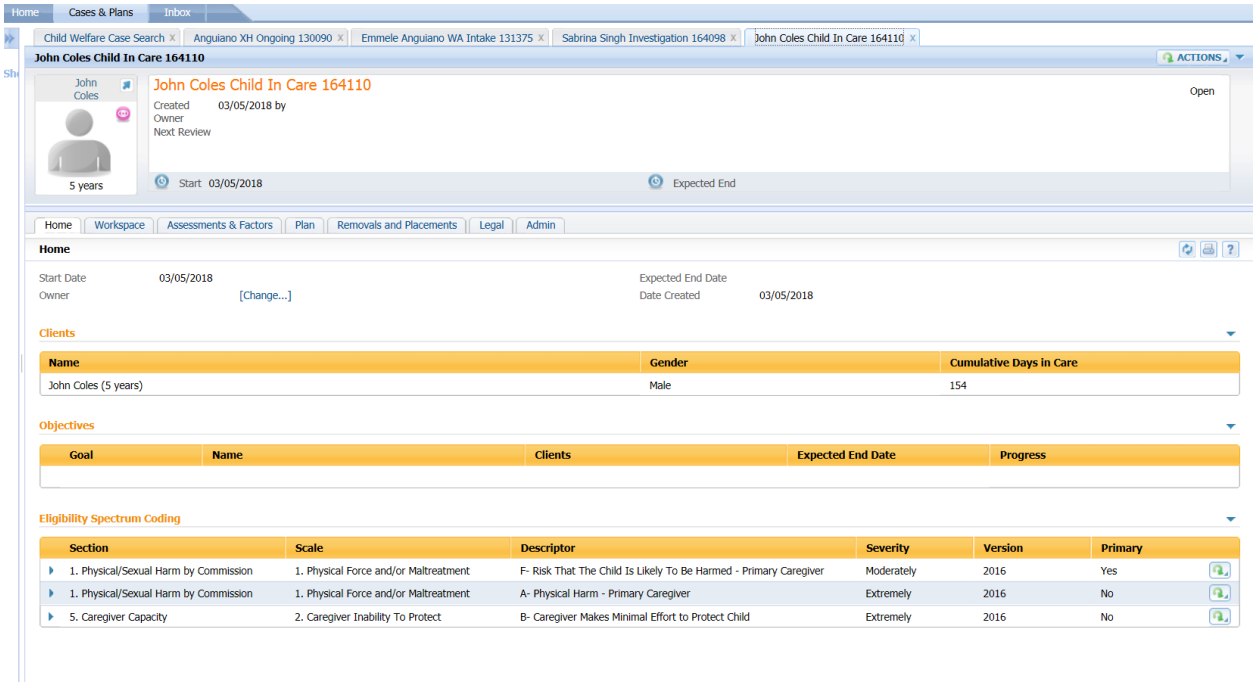


Figure 12: User interface for a child in care case in CPIN

Figure 12 is a child in care case on the home tab from a screenshot of the CPIN training environment, which is populated by dummy data. It was shared by Participant 8 on 3 October 2018. This shows one case type, child in care, but no information from other case types (for example investigation or ongoing). It has the eligibility spectrum coding for this case type alone on the home screen.

Relevant information is available within cases, but this requires opening case files in multiple compartments and following hyperlinks. There is a history section on the person record in CPIN (figure 13), but it is limited.

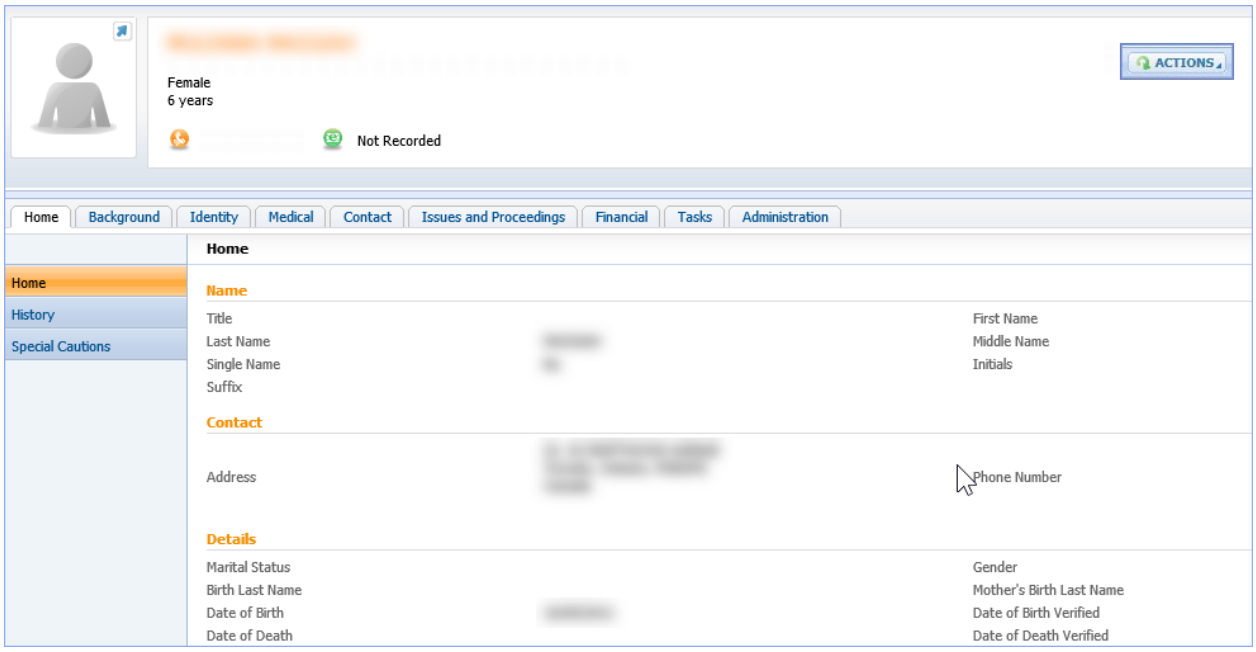


Figure 13: User interface for a person record in CPIN

Figure 13 is a person record on the home tab taken from an agency guidance document shared by Participant 50 on 29 June 2020. It has details about the person. The history tab may have their previous involvement. This would represent the closest approximation to what is in eForms.

The records administrator presented the eForms equivalent of a case history in CPIN and it was “[j]ust person and the agency that had it” (Participant 43, personal communication, 5 November 2019). Tools fit into a context of other tools and ways of working with them. These conditions form a contextual memory that can be disrupted when a new technology does not take this into account and fails to fit in. As we saw in our examples, such as searching for historical records about protection occurrences, tools only make sense in the context of other tools and practices.

8.1.4. Purpose and tool use

Information technology in social work is used for a purpose. The tool is not primary; instead, social workers are primarily interested in the various goals that they are trying to achieve. This section provides examples of goal misalignments in CPIN that caused disruptions related to history review and broader social work objectives. One of the key purposes of information technology in social work is to facilitate review of case history to

better understand a case, flag risks, and inform decision making. Workers found it problematic that features of CPIN disrupted this objective (for example there was a focus on collection over retrieval, incomplete transfer of historical records, and no help with history review), and in some cases, these problems became invisible as CPIN use became automatic, creating the latent conditions for error. Ultimately, workers felt that, within the CPIN system, ministry objectives of compliance with standards had taken precedence over clinical objectives and client outcomes.

Many factors in the design and implementation of CPIN made it difficult to achieve the objective of history review. In general, workers found it easier to collect information than to retrieve it in CPIN: “It’s easier to put in information, but to find out, it’s very difficult” (Participant 54, personal communication, 16 September 2020). Further, as seen in the static memory chapter, not all historical records were transferred. One agency faced records management issues because of the incomplete transition of historical records: “the CPIN transition didn’t happen in a way that allowed us to bring most of the historical records over” (Participant 51, personal communication, 27 March 2020). Where history was transferred, there was little help in CPIN to retrieve relevant information from the past: “what is the utility of having vast amounts of historical information in a clinical documentation system, when you’ve got a case allegation that requires a 7-day response? … how do you sift through all of this information? … how much of it is actually useful?” (Participant 51, personal communication, 27 March 2020). CPIN did not offer an easy means to sift through the historical information that was in the information system. CPIN was seen as a storage vessel for administrative data, not an active memory aid for social workers.

The problems also extended to how information was stored. There was a lack of machine-readable attachments: “when you’re opening up old … files that are uploaded to CPIN as PDFs, … you still have to scroll through … the history to get a snapshot” (Participant 58, personal communication, 16 September 2020). Further, the

compartmentalization of the CPIN system made history review more difficult because the division of roles was taking precedence over the objectives of case recording and review. Some workers gave the example of subsequents, which were new investigations on ongoing cases (Participants 15, 16, 17, and 18, personal communication, 25 October 2018). Subsequent investigations were in a different compartment than ongoing cases, which made it more difficult to search and visualize this involvement chronologically in CPIN. Workers were having to manually link subsequent investigation cases to an ongoing case. Further, attachments remained in the subsequent investigation file, so workers would have to go into that file to find them. They could not see them in their ongoing file. Workers also had to know that those attachments as well as information about collaterals[25] did not get carried over, with one worker saying, “if you don’t know that, from your perspective, you might just think … there’s no collaterals. You’d have to know that that doesn’t get carried over” (Participant 16, personal communication, 25 October 2018). In relation to all these retrieval issues, one after-hours worker said this could “create the potential to miss something” (Participant 57, personal communication, 16 September 2020). History search had not been simplified for workers and they were frustrated because it was interfering with the objective of reviewing case history.

What examples like that of history search reveal is that a subtle shift was occurring away from purposes deemed important to social workers. This was accompanied by what social workers perceived as a change towards ministry purposes. One worker said, “I think, for me, I feel like social work has been watered down. I think that our primary goal is CPIN, completing, achieving [swallowing] the outcomes … and I don’t mean social work outcomes, I mean data outcomes” (Participant 21, personal communication, 20 November 2018). As discussed in the chapter on dynamic memory, CPIN was seen to have a negative impact on

[25] Individuals who may be involved in the case, but who are from different sectors (e.g., doctors, nurses, teachers).

narrative understanding of cases in favour of “data integrity and ticky boxes and where information really needs to go” (Participant 9, personal communication, 26 September 2018). Building on the findings about data entry and history review, this suggests that administrative purposes related to collecting data were prioritized over social work objectives related to retrieving the information needed to understand a case.

Workers also spoke to the disconnect between the social work that they were doing with families and the navigation, recording, and search that they had to do in CPIN to ensure they ticked all the right boxes. Some workers made a distinction between social work, which they felt had not changed, and recording requirements, which they felt had become more onerous. One worker said,

> *it doesn’t change … the work that you’re doing with the family, but Christ, like, to figure out how you had to remove the child, place the child, and then find the foster parent … you could spend an hour trying to figure that out. And … if it wasn’t written in capital letters then … the search wasn’t successful, and it was just ridiculous. (Participant 13, personal communication, 26 September 2018)*

The worker went on to illustrate how difficult it was to complete some of the recording requirements in the field, especially given that placement can occur in a crisis situation and that CPIN was not mobile-enabled and could only be accessed through a laptop. The worker said about their interaction with staff from the placement department, “when CPIN first came out, … I clearly remember being out at a school, I’m apprehending, I’m talking to placements, and they’re like, ‘can you do a PAPR?’ I said, ‘Are you kidding me?’" (Participant 13, personal communication, 26 September 2018). Placement staff needed this PAPR[26] form completed before they could begin their search for a foster home. A supervisor added that “it used to be a phone call” (Participant 9, personal communication, 26 September 2018). For this worker, CPIN did not change the work with the family, but it dramatically changed the record keeping needed to formalize case-related activities.

[26] *Preliminary Assessment and Placement Request* form

While some workers said that the work did not change and that only documentation was impacted by CPIN, others implied that the change in recording requirements was influencing how they did their work and was shifting their objectives. CPIN was seen to simplify what constituted good social work, imposing a vision that was more administrative than clinical, and social workers found this frustrating. One worker gave an example of how there were few outcome measures directed towards how clients were doing: "how do you qualify that a child knows who they can turn to when they are in need? If you're not writing that up, what ticky box do you tick off … to show that that outcome has been met. CPIN's not designed that way. CPIN's not looking for that kind of outcome." (Participant 21, personal communication, 3 January 2019). Measuring clinical objectives was also difficult in CPIN. A supervisor described how the duration of private visits (time spent with the family) could be used as a proxy for quality of service, but ultimately said that "time spent with family, again, quality of that kinda stuff is hard to gauge that piece of it." (Participant 41, personal communication, 10 December 2019). Instead, CPIN created a sense of surveillance or monitoring:

> *I think we've always been recording driven. You always know when you had your … recordings that were due. I think now, CPIN adds … the notion that you're being tracked, the notion that they're taking the information and accumulating it, that actually it's not 'think', I know colleagues … in other branches that can say, 'oh, my supervisor talked to me about my stats this month', right. Ugh. Whoa! Not … your recording, they came to you about your stats*[27] *(Participant 21, personal communication, 20 November 2018)*

Another worker interjected saying that it's not about "the relationships that you're building or that you're fostering or that you're supporting, it's about numbers (Participant 20, personal communication, 20 November 2018). Social workers experienced the administrative objectives embedded in CPIN as foreign and oppressive relative to social work objectives.

[27] While talking about CPIN and social work, Participant 21's voice was noticeably unsettled in the recording.

Worker apprehension about being tracked was manifested in worries about non-compliance with the administrative standards associated with checking the right boxes. When workers were shown as non-compliant, a supervisor noted that “it’s not because the work’s not being done, it’s because we aren’t ticking the right types of things" (Participant 9, personal communication, 2 October 2018). One worker said, “we often get a lot of feedback on what we need to improve and it’s never about clinical work. It’s always about, ‘make sure you tick this box, because we didn’t meet this standard’ … You’re doing the work, but it’s not [inhale]” (Participant 29, personal communication, 18 April 2019). The information system made workers conscious of the administrative focus. It brought this focus on compliance to their attention. One worker showed how their sense of purpose had been disrupted by this new piece of equipment: “I had a purpose, helping families, educating families, keeping families together. Now, … I don’t think social work, really, the first thing that comes to mind is CPIN. It’s more CPIN than social work” (Participant 21, personal communication, 20 November 2018). Workers felt that CPIN’s embedded focus on administrative compliance was misaligned with social work purposes, preventing it from integrating into their practice. The risk was that it could become equipment that would displace or sit uneasily with social work objectives.

The CPIN system was contributing to a subtle shift in the types of work activities that were prioritized within the child protection sector. Specifically, there was a tension between, on the one hand, what workers considered to be important, like client outcomes, narrative understanding of cases, clinical case work, and, on the other, what the information system appeared to prioritize, including measuring outputs, ‘ticky-box’ recording, and administrative compliance. This points to the intentions behind the design. From the ministry perspective, the objectives of CPIN were mitigating risks of missing critical case information, strengthening oversight, and standardizing transformation across the sector (Participant 36, personal communication, 17 October 2019). While these objectives might appear aligned

with those of social workers, CPIN was designed for the purposes of another world – the world of administrative compliance, not the clinical front-line decision-making world. This inattention to alignment with the social work objective of flow in case work and the associated issues described so far ultimately risked undermining ministry objectives as workers noted that “it hasn’t helped, I think, in the way that … it was intended to help in some ways.” (Participant 59, personal communication, 16 September 2020). This illustrates an embodied memory of workers and their equipment, where the information gathering part of their practice should have been a seamless and transparent activity grounded in their expectations that tools would support their decision-making. Tools are used in the service of some purpose, but that purpose can be disrupted and reconfigured by new technology (and the priorities or competing purposes behind it).

8.1.5. Ability and norms in the public nature of tool use

The following examples look at challenges that social workers found in trying to adapt the way they did their work in CPIN because of the changes that were introduced. These examples illustrate how there were many ways in which the flow of work in CPIN did not match preceding practice and how this caused disruption for workers, particularly around their sense of ability to use the system appropriately. It also explores the socialization needed to realign practice with the foreign norms embedded in the information system.

The initial design of CPIN was less public (in the sense of being something that anyone could use) for veteran social workers, as some workers found it difficult to use and many found it difficult to use properly because its norms for use had not yet been internalized. However, the findings suggest that these feelings were most acute for workers who had experience with a legacy system, while new workers were adjusting more quickly to the skills and norms required by CPIN. This indicates that workers have a memory about the capability and norms needed to use a tool as equipment that operates behind their conscious reflection and this memory can differ intergenerationally. In this case, veteran

workers might have been brought up in a paper and typewriter environment, while newer workers, despite being from the smartphone generation, had just come out of universities, where they were using laptops and desktops and navigating e-learning platforms that may have been similar in design to CPIN.

A significant driver of frustration for workers was CPIN's learning curve. It made some workers feel like they had their recording skills reset and were having to relearn from the basics. Others felt like the information system was a failure because it was unintuitive. Workers found learning to use it a big challenge. One worker said,

> *this was a nightmare … This was just, like, you know, you are again being born as a baby and just started crawling and you're at the age of sixty and four or five more years to retire, you are again crawling on the floor with this one. That was … something … that was really very, very difficult (Participant 10, personal communication, 26 September 2018)*

Not everyone was able to use CPIN properly out of the box. The baby analogy suggests that learning the new norms for recording was like making sense of a new world. Another worker shared this sentiment, seeing CPIN's goals as ambitious, but its execution as having displaced established norms of use:

> *I think … an online … program is a great thing because it's easily accessible and all that kind of stuff. I just think CPIN falls down because it's got such a huge learning curve and as I said earlier … nothing intuitive about this program. So, you really have to kind of memorize it and … know where to click to get the information you're looking for (Participant 59, personal communication, 16 September 2020)*

For some workers, CPIN broke with existing norms, ways of doing things, and understandings of how to do things. It was unfamiliar because there was a lack of touch points to existing understandings. It was failing to become equipment in part because it did not align with this memory about the normal use of this kind of equipment.

One example of this break with existing norms was around assigning tasks. Workers needed to create tasks in CPIN, rather than sending emails, as they had done previously, otherwise things were not 'tasked'. One worker said, "even if you sent the email to a supervisor to say, 'I need a child in care worker', they would ignore the email to say, 'I need

a task [about this request] in CPIN'" (Participant 13, personal communication, 26 August 2018). CPIN reconfigured norms around how work was assigned between workers. It made things easier to track, when done properly, but required a shift away from prior habitual ways of doing things.

Many of the structured procedural workflows in the system did not align with social work practice and how cases actually progressed. One worker said,

> *I think a lot of it was our workflows are very, do this, then this, then this, then this, then this and they're great, if a case comes to us like this, this, this, this, this, which none of them do, because we're dealing with human beings and we're dealing with children and we're dealing with systems that aren't perfect, you know, families that aren't perfect (Participant 20, personal communication, 20 November 2018)*

The system had an expectation about how cases were going to proceed. There were assumptions about normal case trajectories built into the system that did not reflect what workers were accustomed to encountering in practice.

> *every day there are things that don't fit the workflow, because … if this then this, I don't have this, I have this. Well, I don't know how to fit that in there, like, I can't fit that into that. So, I think a lot of it is we're dealing with human beings … and we're trying to fit them into this, 'this then this' system, and … it often doesn't fit. (Participant 20, personal communication, 20 November 2018)*

The rigid rules for recording embedded in the system did not align with the flexible norms for tool use that had previously enabled the flow of practice.

As noted before, CPIN also made it difficult for a social worker to understand service involvement and progress because information was fragmented and scattered throughout the various compartments and hyperlinks in the system. This too disrupted the prior way of understanding a case. One worker said,

> *To get one picture of a family. Like, all of the clicks and the pieces are scattered in so many different places, you know. To get one complete picture … it's hard. You really need to know the system well and be pretty computer savvy … to really utilize … the CPIN system and make it useful for you …it's patchy. It's like patchwork everywhere (Participant 15, personal communication, 30 October 2018).*

In older systems workers had a chronology of involvement on one side and notes (categorized by type) on the other. One worker said about their previous system that “it’s very simple”, but with CPIN, “[i]t’s like, ‘why do we have to click so many things’ … coming from a system that was very straightforward, I feel it’s just overcomplicated things, for absolutely no reason” (Participant 17, personal communication, 25 October 2018). Workers with experience of legacy system norms of use were experiencing difficulty normalizing aspects of CPIN that made tasks more difficult than they had been in the legacy system.

There were differences between workers with different levels of experience. Workers that had seen a different information system could compare norms of use. Newer workers who were native in CPIN had seen nothing else, so it was normalized. These differences could also have been related to the different technologies that had been normalized prior to entering the workplace, like typewriters, word processors, e-learning platforms, or smartphones. One worker said, “maybe as [my younger colleague] was saying because the … older workers that knew two systems before have more problem than [my younger colleague], [my younger colleague] has started with the system, therefore [my younger colleague], it is the way that it is.” (Participant 18, personal communication, 31 October 2018). Worker responses suggested that there might be intergenerational differences in the ability to use CPIN and familiarity with the received norms of use. This suggests that certain things can be normalized for workers new to the system, but that workers who had seen something different might resist those same things, resulting in different degrees of ability to use and different norms of use between generations of workers. In this way, equipment can act as a tool for organizational change, subtly reconfiguring the work that gets done and what it means to be a social worker. Despite this, there were some things that impacted all workers.

The absence of established norms led to ambiguity in record keeping. There was room in CPIN for individuals to have different recording practices because there was nothing

constraining where workers decided to put their information, especially where there were no compliance implications. One worker said that,

> *there are infinite number of ways to get the same thing done in CPIN, which … we understood from the beginning was not the way it was going to be. … you get in team meeting and you'll say, 'no, … I put it here', 'I do it here', … and you could see the looks on people's faces and all of us, like, 'oh my gosh, which one of us is right?'… and I'm thinking, 'oh my gosh, the whole purpose of this was that there's one way to do', that's what I thought." (Participant 20, personal communication, 30 November 2018)*

Another worker shared this concern, saying that "everyone has their own interpretation of the conventions and stuff like that" (Participant 59, personal communication, 16 September 2020). Initially in CPIN, there were no shared norms for use.

Within this ambiguity, there was peer pressure amongst workers about expected standards of recording and socialization to create specific types of records:

> *there's judgement amongst workers about, like, 'why did they do it this way? Why didn't they get it on time? Why', you know, 'Why, why does their contact log look like that?' I've heard a lot of that amongst workers. … sometimes the fact is … we focus our time elsewhere. … those that have … CPIN perfect files … they put in the extra, kind of, volunteer quiet hours on the side" (Participant 55, personal communication, 28 August 2020).*

Workers were re-establishing norms for what should constitute appropriate recording. But, they were also contending with misalignments between the norms for use as designed, the constant changes from the ministry's harmonization and reporting working groups, and the everyday flow of work.

Some workers felt that some of the issues were related to CPIN having been originally designed for a different service sector and thus bringing with it different and incompatible or jarring norms for use. One worker believed that the system was designed in a compartmentalized way for a different type of work,

> *my speculation is that … the system was … formatted … for something else … they do all the computer things for this piece, and for this piece, and for this piece, and for this, and then they have the product. But, … in what we do, that doesn't work that way. It's connected … this is … the, it could be a speculation, the reason that … the parts are not necessarily … well connected (Participant 18, personal communication, 25 October 2018)*

and this worker concluded that, “[h]as sense in a factory, but doesn’t have … much sense here.” (Participant 18, personal communication, 25 October 2018). Another worker suggested it was designed for benefits payments: “I don’t know how accurate this is, but I was told that CPIN was actually built for … Ontario Works and financial support … and it was tweaked … for child welfare services” (Participant 56, personal communication, 27 August 2020). The Cúram website suggested that the software was for “needs-based and contributions-based programs” (Cúram Software 2006) and the province of Ontario implemented Cúram as part of their Social Assistance Management System, which was intended to manage benefits payments (MCCSS 2015). The norms underlying the design of this case management system were foreign to those the workers had grown accustomed to in their customized legacy systems.

This section looked at the ways in which CPIN did not always manifest as a public tool, insofar as it was not equally usable by different workers and the appropriate way to use it did not align with the preceding norms for equipment. There is memory embedded in the capacity to use a tool, as well as the norms guiding correct use. The introduction of a technology that does not align with capacity and norms will disrupt the flow of work, but in so doing it opens a window onto the implicit memory operating in the background.

8.1.6. Summary of the features of implicit memory related to equipment

The preceding examples seem to indicate that there is a form of memory related to the tools that workers use that is characterized as being of a different nature than an object of analysis, tending to disappear in use, only making sense in the context of other equipment, being used for something, and being public insofar as it can be used by anyone in accordance with a set of norms. This form of memory is made up of a background understanding embedded in the infrastructure and practices that allow activity to make sense. These features were revealed when CPIN precipitated breakdowns that caused workers to reflect on their experiences and expectations. Implicit memory in tool use is this

background understanding embedded in the nexus of people and tools that enables practical activity.

8.2. Trauma and disquiet reveal another form of memory

This section looks at how CPIN faded, or failed to fade, into the background for workers and how this suggests a form of memory that is different from those we have previously explored. As discussed in the previous chapter, according to Polanyi, tools become extensions of our bodies as we use them in a subsidiary way to make sense of something of which we are focally aware. While we questioned the extent to which this type of phenomenon has anything to do with knowledge, examples to this effect were found in child protection, specifically with respect to the digital tools workers use to manage their cases.

The different interactions between social workers and CPIN as a tool for social work case management led to manifestations of frustration and uneasiness with the information system. It did not seem to fit into the world of these social workers. CPIN appeared to be interacting with another type of memory that was embedded in how social workers understood the work that defined their being. This section provides examples associated with the five features of tool use where the focus was the being of social workers and how they self-identified professionally, rather than the being of equipment.

CPIN was an object of attention, but workers felt that maintaining their professional status depended on learning how to use it. Some workers found that CPIN frustrations had dominated team meetings since 2014 (when CPIN was expected, but not yet implemented), saying “it just takes away from so much other stuff we could be talking about” and “it’s overwhelmed us for years” (Participant 20, personal communication, 30 November 2018). This worker felt that the sector was left with no alternatives, saying that the mentality was “learn it, or quit” (Participant 20, personal communication, 30 November 2018). As illustrated by the breakdowns in the previous section, there were signs that workers did not consider

this to be a piece of their equipment. This tool was very much an object of attention, but workers were expected to learn how to put it to use. Here again, there is a distinction between tool in use and tool as object of attention, but here it has implications for what it means to be a social worker.

Some workers identified a space between visible and invisible tool use where they had learned to use CPIN, but it did not fully align with how they self-identified as social workers. Another worker commented on how the system was usable, but not user friendly, saying that they knew the proper way of doing things in CPIN, but did not love it: “I’m stuck with it, right … I’ve figured it out, I do understand the kin services, … I understand it now, I understand how to do the work, I understand where it’s supposed to go, I understand, [inhale] I just don’t love it. Right” (Participant 20, personal communication, 30 November 2018). Another worker shared this sentiment, saying “I think that’s, kind of, what they’ve given us and what we’re to accept” (Participant 29, personal communication 18 April 2019). Workers maintained morale with humour in face of feelings of powerlessness: “It’s a computer system. It’s not perfect. I get that, … we learned to just laugh. We learned to just get around it. … what can you do, right.” (Participant 20, personal communication, 30 November 2018). CPIN appeared to be capable of invisibility, but continued to generate a level of existential disquiet in workers who had reluctantly acquiesced to its use.

The CPIN system also reinforced trauma and induced higher levels of anxiety because of its lack of sensitivity to the conditions in which social workers worked. One way it did this was that CPIN timeline enforcement was insensitive to worker experiences of trauma:

> *you could have … a really hard 1 or 2 hour visit with a family and then, within 24 hours, you have to write about it again and put it into CPIN … and if you don’t, you know, maybe you needed time to process, maybe you needed time to kind of … get yourself together. So, maybe you don’t get that contact log in within 24 hours. You can see that in the system. … so, the way that looks in the system, it could be, like, ‘oh, they did it late, they didn’t do it’ … the way that things appear can comment on what your work looks like when*

> *it might not be the reality (Participant 55, personal communication, 28 August 2020)*

In this case, social workers have an implicit understanding that they may need time to process some of their experiences in the field, but the recording tool they are expected to use and the timelines they are expected to follow do not afford this. The system is disruptive when it is insensitive to the context of social work practice, of what it means to be a social worker.

CPIN prioritized purposes related to administrative compliance and information system specifications for proper recording over the purposes related to the practice of social work. The memory embedded in underlying professional or occupational purposes was an added place of contestation. The trauma of the work in the world of child protection was compounded by anxiety about compliance, either because of incorrect recording or needing to prioritize:

> *when upper management wants reports and then we get the long list of who didn't meet their standards, sometimes we do and we know that we did meet the standards and just didn't click off the ticky box, but even just getting that list … we don't talk about it, but getting the list of, like, 'you didn't meet your standards on all of these cases', … it's anxiety provoking, on top of all the other work that we do that is anxiety provoking. … workers, amongst themselves will … talk about how it feels every time we get that list. … I think … that list comes out of CPIN because we are now able to run reports that collect that data, … but because it's so specific, … it needs specific boxes ticked … to acknowledge that you did the work. (Participant 55, personal communication, 28 August 2020)*

CPIN acted as an object, a piece of recording technology, that did not disappear, but that created anxiety for workers. When the system did disappear, sometimes it would reappear after trapping workers because they did not fill in or select the right boxes during the flow of their recording, leading to anxiety about non-compliance with administrative requirements whenever they were shown their reports. Social workers felt as if they were dealing with a foreign purpose that was primarily compliance-driven and not related to their professional identity.

Some workers resisted the desire for the system to become normalized, as it added more stress to their work: “I know sometimes it might sound a little petty, like, ‘oh, just get to know it and get to use it’, but at the same time, … it’s making to do something so simple much longer. This job is a very stressful job. You’re trying to do something and that’s added onto your stress.” (Participant 17, personal communication, 25 October 2018). Workers were reticent about the system because the proper way to use it added more stress to their jobs. It was not attuned to what it meant to be a social worker, specifically around the exigencies of front-line work.

This section looked at examples of frustration, trauma, disquiet, and unease that quietly persisted behind the problems and changes that workers were experiencing. These examples hint at a form of memory that is related to the being of social workers, rather than the being of equipment. Whereas equipment is related to what is being done, what is being done is related to the involvement and absorption of human beings, what each human being is. This way of being of humans and how it relates to memory will be treated in the next chapter.

8.3. Concluding statement

An information system does not just store information, it also fits into an existing world of practices and understandings that enable activity to make sense. It is both a storage bin for memory and an essential element of the memory behind action. If a new tool does not seamlessly fit into that background, then it can lead to disruptions in the flow of everyday work and coping. It can also make subtle changes to the equipmental whole of which it is a part, as well as the being of those who inhabit its world.

This chapter looked at some examples of how workers use tools to get things done in a child protection setting. It highlighted some features of a form of memory that implicitly operates behind practical activity and how this activity can be disrupted and reconfigured by the introduction of new technology. Specifically, it looked at how technology enters the

workplace as equipment, how it tends to disappear behind the objectives it is intended to support (when it is working well), how it is related to other equipment and the context, how it is used for a specific goal or purpose, and how it is public (any skilled user can use it and there are norms for its appropriate use). These features helped to illustrate the distinctiveness of memory in equipment. Specifically, they highlighted how there is a consensus understanding and body of infrastructure that precedes effective tool use and that makes the skilled use of that equipment possible. The examples of breakdowns surrounding CPIN brought into relief the difficulties when this memory is not present, is being embedded, or exists to different degrees in different workers. It also shows how digitization does not in itself improve memory by better ordering and preserving explicit memory, but that this is dependent on how the instantiation of digitization, the tool itself, fits in with the worlds of existing practices and tools. The memory embedded in this equipmental nexus conditions the viability of a tool and could prevent it from achieving its intended objectives. However, examples also illustrate how technology that disrupts existing understandings can begin to shift background memory such that the way in which things are done can begin to change. Memory is not just data, interpretations, or conceptual frameworks, it is also our understanding of how things are done and the tools we use to do them.

In a child protection setting, CPIN manifests two ways of being. We can ask a social worker to describe the information system and its properties, but we can also watch a social worker use the system when trying to do something else, like review a case history or record the salient elements of a recent interaction with a family. When the equipment is subordinate to the task, it becomes transparent. However, ‘genuinely appropriated’ or ‘transparent’ equipment can also shape how activities are done as an element of a holistic task environment. That people can use a tool and that they can use it in a normal way for some purpose in the context of other equipment in a way where they are not typically thinking about the tool, but only the objective, is a form of memory related to equipment.

The features of tools in use presented in the preceding examples align with Heidegger's ideas about equipment and the fundamental ontological focus. This suggests that Heidegger's ideas offer a framework within which to better understand implicit memory phenomena and how inattention to this form of memory could be responsible for unintended consequences in information system change. Making a distinction between tools as objects and tools in use as equipment enables an analysis of memory that extends beyond tools as repositories of information towards tools as manifestations of the understood ways of doing things. Through this distinction it is possible to apply a novel lens to understand how users encounter tools in practice and make sense of breakdowns and unintended consequences of information systems change.

The distinction between present-at-hand and ready-to-hand is also important because discussions about memory tend to focus on representation, like structured or unstructured data, the stories people tell each other, or the symbolic element of categorical thinking. This focus can sometimes be to the exclusion of equally interesting memory phenomena embedded in everyday activity and how they influence the things that are committed to explicit memory. This distinction also helps to expose how information system change can have unintended consequences for organizational memory by transforming how things are done. In this case, many of the features of equipment broke down in the shift to a new information system, as some workers had their existing background understandings completely overturned. Norms for use had to be re-established, some purposes seemed foreign or abandoned, connections to other tools were altered, and all of these things made CPIN very visible to workers. We also saw how efforts to normalize the system were being made and how workers were acknowledging that operating in the system was becoming more automatic. However, examples showed that a certain disquiet seemed to persist despite the reconfiguration of practice. Much of this related to what workers felt it meant to be a social worker and what the information system was conditioning them to be.

Chapter 9: Implicit memory related to being-in-the-world

This chapter looks at the final form of memory that will be covered in this thesis, mainly, that which is embedded in being human, or, more prosaically, the self-interpretations we adopt from the world(s) around us that order our activities. This form of memory is intimately tied to that embedded in equipment, but whereas the previous chapter focused on the memory behind doing, this chapter focuses on the memory underlying why people do anything at all, why they take particular stands on the things they do. It is intimately tied to the idea of identity, which provides a guide for what an organization's members should do, how they should be held accountable, and how other should relate to their ordered activity. In this case, we will be specifically looking at the being of social workers, the worlds they have to navigate, their coping with the worlds of others (as conveyed through CPIN), and the relationship of their being and these worlds to organizational memory.

This chapter is structured as follows. First, it presents some examples from the research that highlight characteristics of organizational memory embedded in being, specifically, (1) the different worlds in organizational settings, (2) the shared nature of these worlds, (3) how they are largely invisible, inhabited by workers, and prior to activity, (4) how they order activity, and (5) the way they are connected to the use of equipment. These characteristics align with ideas about being, discussed in the literature review, based on Heidegger's fundamental ontology. This chapter concludes with a discussion of technology,

being as a form of organizational memory, and the implications of this interpretation for the thesis puzzles as well as digital change in government more generally.

9.1. Examples of memory in being

This section presents examples from the research that illustrate different characteristics of the implicit memory that is associated with being. These examples appear to fit into five broad categories. They highlight how a form of memory operates in the background behind, or in conjunction with, those we have covered so far. This section presents examples that suggest (1) that there are different worlds that enable different identities (including overarching worlds and a plethora of subworlds, such as the public sector world with government administrator and professional social worker subworlds); (2) that these worlds are collective or shared; (3) that these worlds are invisible or operate in the background, insofar as they are prior to being, are already unveiled in advance, are inhabited or dwelled-in, and are understood, not known; (4) they depend on a purpose (not a goal, but a self-interpretation that informs and orders all activities and that is not necessarily intentional); and (5) are connected with doing and the equipment workers use.

9.1.1. World and subworlds exist and are necessary for being

The examples in this subsection make the case that different worlds exist in organizational settings and that they embody a memory about what identities are available for adoption in each of these worlds. In the case of child protection, it shows differences at multiple levels. Between organizations, it shows differences between the worlds of social work, university, software development, administration, and clients. Within agencies it shows differences between different departments, compartmentalizations within CPIN, and even generations of workers. The examples also show how worlds can come into conflict through technology that spans boundaries.

Different organizations are different worlds

There was evidence of differences in worlds across organizational boundaries. The world that the research took place in was primarily social work within child protection, but there was reference to others including university, software development, public administration, and client. References to these worlds discussed their perceived differences from social work.

University and work were seen as different worlds, where social worker training and education differed from social work practice. One worker said, “you come … from the university with ideas and … approaches, and the reality is the reality.” (Participant 18, personal communication, 25 October 2018). Classroom learning was seen as different from front-line work and the skills of recent graduates were seen as different than those of established staff.

The software developers working on CPIN and the social workers who were expected to use it also appeared to inhabit different worlds. One worker said, “I think if you’re competent with computers and technology and software and … programming … it will be easier to navigate because … you have to have that kind of mind in order to understand this system.” (Participant 29, personal communication, 18 April 2019). Some of the design choices in CPIN showed how developers did not understand child protection and instead embedded the logic of their world. One worker commented on one of their design choices[28]: “Again, one of those things where you’re like … ‘who’s the business people in the background … helping … these techie guys write this stuff?’” (Participant 40, personal communication, 4 November 2019). Design choices showed workers that developers must have been in one world, had no understanding of theirs, yet were able to set the system logic that structured record keeping in theirs.

[28] The difficulty of bringing ‘other child welfare’ and provider data together

The world that social workers, by far, commented on most frequently was that of government public administration and how, through CPIN, its standards and compliance expectations differed from and came into conflict with their professional world of clinical social work. The following paragraphs build on some of the examples seen in the explicit memory chapters, which hinted at different worlds between the ministry and front-line services, such as migration decisions that favoured administrative objectives over those of social work. The examples show further differences between standards, performance incentives, and managerial and audit culture on the one hand, and clinical social work and good practice on the other.

Workers noted differences between the practical exigencies of social work and the expectations in CPIN from the ministry administrative world about compliance with standards and meeting performance targets. One worker suggested that since CPIN, workers were more concerned about meeting standards than practicing good social work because the incentive was to produce good numbers to get good performance results (Participant 29, personal communication, 18 April 2019). They suggested that this was related to a managerial and audit culture, where accurate and readily available clinically relevant information, like Signs of Safety, was falling to the wayside relative to administrative and audit data (Participant 29, personal communication, 18 April 2019). This worker concluded that this led to a fundamental shift in worker identity: “I would say, people feel that their role has changed in that … they’re not doing social work … as much as they’d like to, and it’s more administrative.” (Participant 29, personal communication, 18 April 2019). Administrative and audit activities and information were prioritized over those needed for social work. Workers felt that they were being transformed from social workers into administrators who needed to be measurably compliant with standards.

Supervisors were also noticing how the work had shifted more towards compliance with administrative standards. One supervisor said, “staff have had to do a lot more

administrative work in order … to feed the CPIN machine" (Participant 15, personal communication, 30 October 2018). Another said, "it focuses the work on … administrative stuff". (Participant 55, personal communication, 27 August 2020). However, supervisors also noted that "doing well clinically is different from doing well with standards, right." (Participant 41, personal communication, 5 November 2019), suggesting that compliance did not entail good clinical work. Supervisors themselves were also feeling a shift towards greater policing of compliance with standards. One supervisor said, "we've had to learn how to be … better administrators" (Participant 41, personal communication, 5 November 2019). Social work in CPIN was more focused on administrative compliance because the information system was demanding that type of work.

Further evidence of the difference between the administrative world of the ministry and the professional world of child protection was the need to translate materials from one world to the other. For example, agency level administrative staff, who understood front-line work and ministry expectations, had to translate ministry guidance documents so that they would be interpretable and meaningful to front-line staff (see figures 14 and 15 below).

Topic 4. Ongoing Service Plan

Exercise: Create an Ongoing Service Plan

Scenario

Create an Ongoing Service Plan for the <Primary Client> Ongoing Case.

How to Access

Continue from the **<Last Name> XYZ Ongoing #####** case.

Steps

<Last Name> Ongoing ##### Outcome Plans Tab

1. Click the **blue hyperlink** under the Reference column.
2. Click the **Plan** tab to display the Objectives page.

Plan Tab

3. Click **New** to access the *New Objective* wizard.

New Objective Wizard

4. Enter the following field values:

Field Name	Value
Select Objective	Positive family relationships/interactions
Expected End Date	Select date 30 days from today
Clients.	Click the check box beside Name to select all family members
Goal	Well-being
Reason	Enter narrative

5. Click **Next**.
6. Select **Family Relationships** for <Primary Client> XYZ and <Secondary Client> XYZ.
7. Select **Family Relationships Child** for <Child One> XYZ and <Child Two XYZ>
8. Click **Finish** to return to the Plan tab.

Figure 14: Ministry guidance for creating an ongoing service plan (excerpt)

Figure 14 is from *Ongoing Management in CPIN: Participant Guide* (p.5), 16 July 2018, version 6 (Ontario 2018) shared by Participant 39 on 17 December 2019.

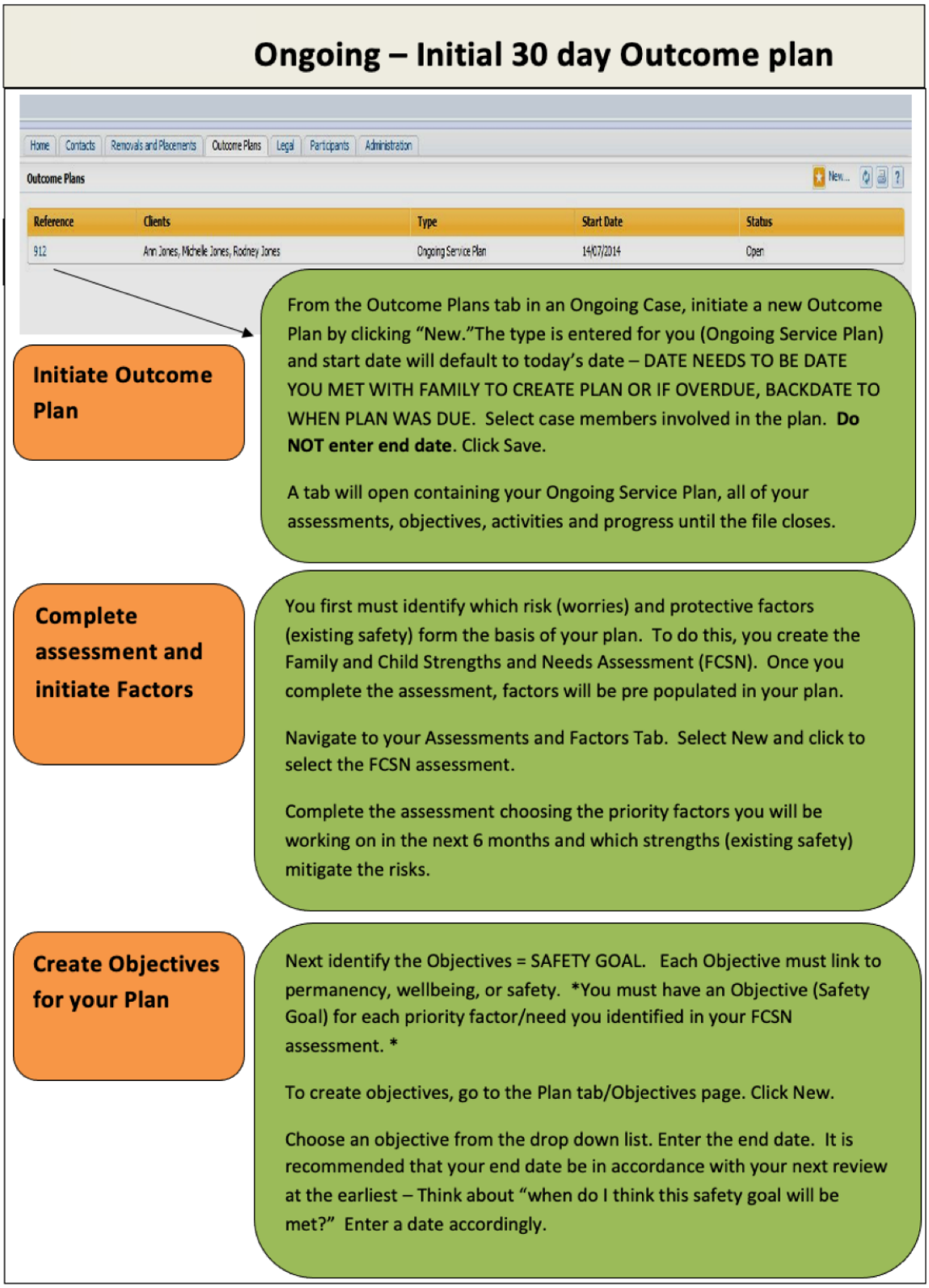


Figure 15: Agency desk guide for creating an ongoing service plan (excerpt)

Figure 15 is from an internal agency desk guide, dated 6 November 2018, created to translate the ministry guidance for a social worker audience, shared by Participant 27 on 17 December 2019. Notice that the agency documentation has a screenshot of the interface for

reference. The text includes more detailed explanations and clarifications where there was ambiguity in the ministry documentation.

Workers saw the implementation of CPIN as something they had to survive (see figure 16), making the best of the skills and materials they had at their disposal.



Figure 16: 'Survivor CPIN' webpage – Halton Children's Aid Society

Figure 16 is a webpage presenting a 'Survivor' celebration for the 1-year anniversary of CPIN at Halton CAS. The web page was originally accessed on 15 May 2019, but has since been taken down. A copy of the web page from 7 August 2016 is available from the Internet Archive: https://web.archive.org/web/20160807035557/http://haltoncas.ca/home/child-abuse-prevention-month/.

CPIN created an adversarial space for workers, suggesting that worlds had come into conflict. I overheard the following at a children's aid society while waiting for a meeting: 'I'm gonna go fight with CPIN.' (fieldnotes, 25 September 2018). This is more evidence that the worlds that CPIN embodied (developers and IT logic, administrators and compliance) conflicted with the world of social work.

This focus on administration may have also had the perverse consequence of de-emphasizing the world of clients. Time standards and deadlines were seen to compromise clinical social work. Data was seen as not being for service or serving the interests of the clients, but for oversight: "those kind of ministry standards that they've imposed since CPIN … it does not serve … the client … at all" (Participant 29, personal communication, 18 April 2019). The standards imposed were seen to serve the administrative world, not the world of the clients.

Different departments are different worlds

Even within each children's aid society, there also appeared to be different worlds between different types of workers. There were subtle differences evident between back-office analytics and front-line staff in relation to CPIN. For example, front-line workers expressed frustration with the presentation of reports in Tableau reporting software because it used case numbers rather than names. Workers knew their cases by their client's names, not by the numbers generated in CPIN. One supervisor said, "[t]here's no way off the top of my head that I would know what case that is … without knowing the name. So, I have to go back here [mouse clicking] and then cross-reference against the case number." (Participant 9, personal communication, 26 September 2018). Another supervisor edited reports from the quality assurance team to eliminate unnecessary columns before sending them to workers so that the information was more easily digestible (Participant 41, personal communication, 10 December 2019). This suggests different worlds, even within the same organization, between front-line staff and back-office analysts.

Different compartments are different worlds

Within departments there appeared to be different worlds between workers in different functional areas (such as placement or investigation). There was a disconnect because workers were only trained to use CPIN in their compartmentalized case type, so they lacked an understanding of the worlds that their colleagues were working in and how to navigate those recording spaces, including the conditions and expectations facing workers in other compartmentalized areas of the service delivery pipeline. When trying to work across compartments, one supervisor said, “I don’t think many supervisors are as comfortable going into different case types” (Participant 9, personal communication, 2 October 2018). They added, “there’s so many areas that meld a little bit and because people were only trained in certain areas it makes it really difficult” (Participant 9, personal communication, 2 October 2018). Different compartments in CPIN represented different worlds. The informational experiences were different across CPIN users. As a result, workers were not able to understand the experiences of their colleagues and had misaligned assumptions and expectations about these worlds.

Different generations are different worlds

Within functional areas, there also appeared to be different worlds between newer and veteran workers. In the previous chapters we saw the influence of familiarity with legacy systems. This section focuses on how different experiences translate to different ways of doing business. One worker said, “if you have the history and if you’ve been here long enough, you probably have a different way of doing business than if you are just graduated and you come out of …, U of T [the University of Toronto], or whatever with your MSW [Master of Social Work]” (Participant 1, personal communication, 24 August 2018). This could have also had to do with intergenerational differences in familiarity with technology in life and the classroom, as another worker said, “the younger cats as well, because they have a different exposure to this stuff [software and computer systems], … do really well”

(Participant 29, personal communication, 18 April 2019). Level of experience in the workplace and familiarity with technology seemed to make different generations different worlds. As seen in the examples, different worlds existed in and around children's aid societies (for example, between departments, service compartments, generations of workers, as well as with the ministry), and these informed worker identities.

9.1.2. World is collective and shared

The examples in this subsection make the case that each world is a kind of collective memory about the types of activity-ordering self-interpretations that are possible within those worlds. They highlight the collective nature of socialization into child protection, as well as the boundaries and collective nature of world, when one world comes into conflict with a different world.

Socialization and collective worlds

In terms of socialization, some workers suggested that learning child protection practice took time, mentorship, and training within a CAS organization (Participants 9, 10, 11, 12, and 13, personal communication, 26 September 2018). There were things that had to be embedded implicitly to enable individuals to become skilled and effective workers. One worker was concerned that the appropriate coaching did not exist in the organization to create skills or upskill and that that type of socialization was being replaced by technology, saying: "again, maybe if we were doing more of that, we wouldn't need a tool to prompt us, or we wouldn't need … other aspects of technology … because if we were doing that in supervision, or even just, I mean, I guess we can get it amongst our peers, but ultimately, I think that's the role of a supervisor to be doing that." (Participant 13, personal communication, 5 October 2018). Expertise was seen to be transmitted from an experienced worker promoted to a supervisory role, rather than prompts built into an information system.

Conflict between worlds and collective boundaries

Beyond socialization, examples of shared worlds only became apparent when assumptions were made about the equivalences of worlds and conflicts emerged. In these cases, boundaries in understanding between worlds arose, highlighting the shared understandings within each of those worlds. Examples included differences between agency analysts and central association analysts on information requests, CPIN trainers and social workers on examples used in training material, and the ministry and social workers on CPIN as an accountability tool.

An interaction between the Ontario Association of Children's Aid Societies (OACAS) and agency analysts revealed how worlds were not shared across these boundaries, but included collective understandings within. Children's aid society workers found that those working in their central association had expectations that certain things would be possible in a world that they were not part of, in this case when making requests for information. One worker found that living in different worlds prevented people from making the right data requests in language that could be understood, translated, and actioned: "they were basically asking for something that has never been asked for before and we didn't have a good way of pulling" (Participant 4, personal communication, 20 September 2018). The OACAS wanted to understand what was happening with intakes that were proceeding to investigation, but when they sent their survey, it included RRFINRs [Report Received Full Investigation Not Required] (See figure 17 below).

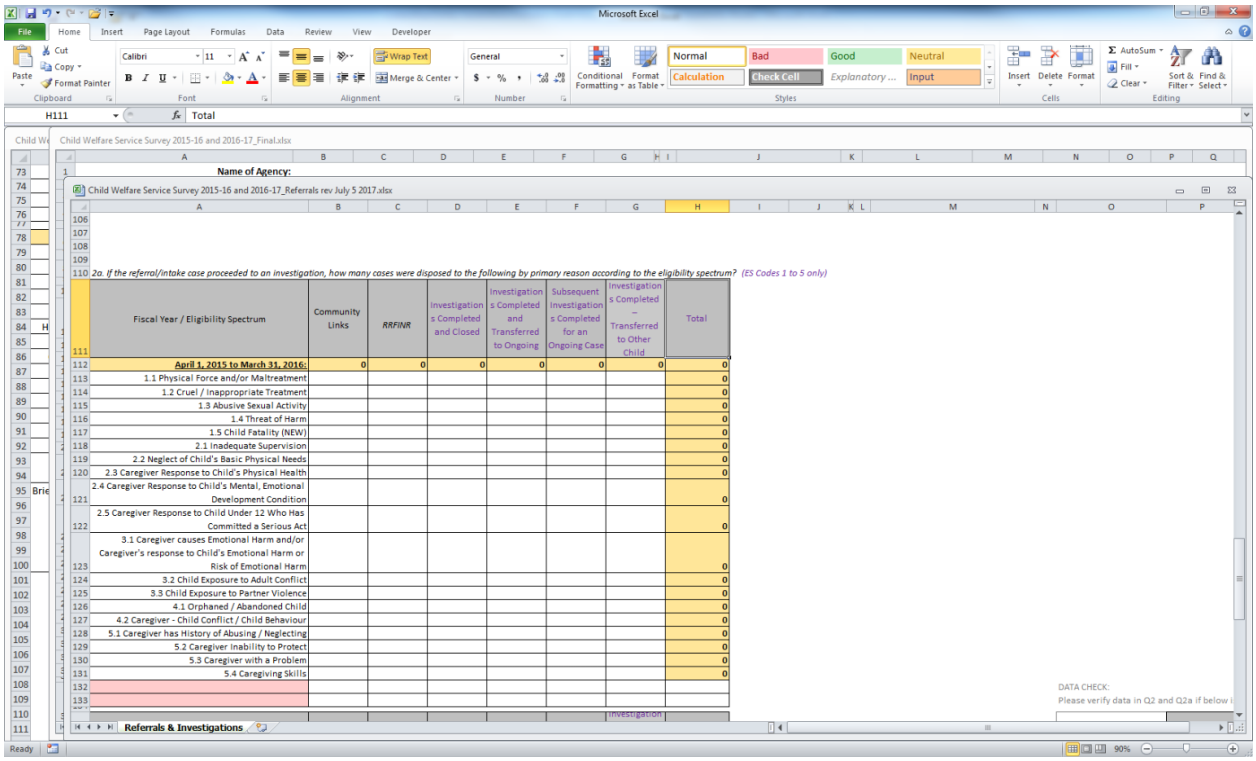


Figure 17: OACAS Child Welfare Service Survey Excel template

Figure 17 is a screenshot shared by Participant 4 on 20 September 2018. This Excel template included RRFINRs alongside cases that proceeded to investigation.

By definition, these RRFINRs do not proceed to investigation, so agency staff were confused about how to complete the request. One agency analyst said that “what we try to do, of course, is have our stats, kind of, line up, right. If we’re gonna submit something to the OACAS, we want it to correspond to what’s on the quarterly reports. … But, what they were asking, there was no way it was gonna correspond to anything” (Participant 4, personal communication, 20 September 2018). This communication issue suggested that OACAS and agency workers were in different worlds with different shared understandings of what would be possible.

Another example illustrates the different worlds occupied by ministry CPIN trainers and the social workers attending that training. CPIN trainers used an industrial example and agency participants saw this as dissonant with child protection practice. One worker said,

> *I remember … one of the trainer that came from outside said when they chose some graphic about … the development of … a qualitative … goal and the person was very happy with it … and I said that was … a factory*

> *kind of … thing, I mean, it wasn't, you can't apply that in [fidgeting violently with pen] … a useful way in social work, I mean, working with families (Participant 18, personal communication, 25 October 2018).*

CPIN trainers treated social work and human services work as something that private sector management principles could be easily applied to. However, they could not identify 'goals' that workers found meaningful. Trainers shared beliefs about private sector values that did not coincide with social worker beliefs about child protection.

Another example showed how the ministry did not recognize the distinct expertise in the sector and were unable to work collaboratively on accountability data. One worker explained their perception of the situation of the ministry:

> *That's what was driving it. They were being held accountable or being asked to be held accountable and they didn't have the data to support that. So, I understand the rationale for it. I think they just didn't think about all of the implications and they don't understand the work well enough and don't value the fact that there are experts in the field doing the work that do understand the work well enough that also understand and support their goals, to do that collaboratively. (Participant 47, personal communication, 23 January 2020)*

This example highlights the ignorance of one world (ministry administration) about another (social work) and the failure to value the expertise in that world in order to come to a collaborative and mutually beneficial solution. The administrative world made assumptions that its values were shared by social workers, but this was a separate world with its own shared values.

These examples suggest that in organizational life, each worker makes commitments to certain shared identities and values. Each worker makes an individual commitment, but it is to collectively understood identities defined by collectively understood purposes that form a collectively understood background memory embedded in these worlds. The focus shifts from the individual to the collective as each individual manifests the shared implicit memory in their worlds.

9.1.3. Worlds are the background for being

The examples in this subsection make the case that worlds form the background for, and precede, being. They do so by being invisible, insofar as they are prior to being, are already unveiled in advance, are inhabited or dwelled-in, and are understood, not known. The examples from the research highlight how technology can be part of this background, but its introduction can also disrupt this background, thus revealing aspects that were previously taken for granted and pushing workers to take refuge in familiar activities.

The change that veteran workers experienced with CPIN in relation to their legacy systems was invisible for newer workers. One worker said about new workers who knew no other information systems, “if you’re a new grad coming in and this is, kind of, what you’re taught and the way that it’s supposed to be, that’s, becomes the way you practice” (Participant 29, personal communication, 18 April 2019). When a new technology is all a worker knows and is part of the world prior to their initiation, it is an invisible and understood element of the practice they inhabit. As such, a practice change was normalized in CPIN for new workers.

Whether veteran or new, there were workers who experienced feelings of stress about meeting compliance standards in their record-keeping. This external objective was causing them to focus their attention on administrative data and record keeping, potentially to the detriment of the case work part of their world. CPIN was getting people more focused on data entry and compliance than work with clients. One worker said,

> *I think there’s that little bit of, [clearing throat] I don’t know, … anxiety … urgency … I feel there’s more people … stressed about the work because now other people can see it and … it’s a lot more out in your face, if … you’re not meeting compliance, you’re not doing things correctly, that sort of stuff. So, … record-keeping from a general perspective has … got people a little bit more backs up, but maybe focusing on the work a little bit more, like, the record-keeping side of the work, not necessarily the people side of the work. (Participant 40, personal communication, 4 November 2019).*

Anxiety about performance on recording requirements was taking away from the focus on ‘the people side of the work’, which had previously been taken for granted.

CPIN led to a reorientation of what was considered ‘correct’ social work in child protection, thus influencing what it meant to be a social worker in this field. For veteran workers who were having to learn a new system, some struggled and took refuge in the parts of the job that they were comfortable inhabiting. One worker said, “I remember someone saying, when we first went on to CPIN, ‘I’m just gonna go out and see families, ‘cause that’s the only part of my job that I know how to do’” (Participant 42, personal communication, 5 November 2019). Similar phenomena were observed in the UK: “Whilst it is tempting to berate the maverick professional who subverts correct procedure, it is important to remember that there are ‘good’ organizational reasons for such behaviours, namely reconciling the competing elements of the IAS [information system] with imperatives to safeguard children and to support families.” (Broadhurst et al. 2010, 367). CPIN was demoralizing for social workers faced with new recording practices, as a result they would default to front-line work, the work they dwelled in. This disruption revealed what had previously been in the background.

The introduction of new technology can transform the background understandings into which new workers are socialized, but it can also disrupt a world if the technology does not fit in to its inhabitants’ self-interpretations, especially when the technology seems externally imposed and mandatory. This can make it visible, but also highlight what was understood and invisibly operating in the background under normal circumstances. In this section’s examples, the disruption caused by CPIN made worlds visible, either resulting in “deliberate reflection" (Tsoukas 2011, 470), or something less than reflection, but that ”is more determinate than transparent functioning” (Dreyfus 1999, 77). This suggests that worlds, and the memory embedded in them, are normally invisible and taken for granted, but that, like equipment in breakdown, they become more available for inspection during periods of disruption.

9.1.4. Being in a world depends on a purpose

The examples in this subsection make the case that another feature of the memory behind being is a purpose. Worlds enable certain self-interpretations that give order to activities. As we have already seen, within those worlds, multiple subworlds can exist in organizational life. They precede any individual initiation into a world and are largely understood and invisible as people dwell in them. They are also inherently collective as they are prior to any individual interpretation. This subsection will look at purposes in the sector, specifically focusing on conflicting values stemming from technological change and how this brings purposes to conscious attention and influences accountability.

Technology examples related to purpose

Technological change can influence what values are prioritized. In the fast-paced environment of intake, workers felt pressure to meet standards and there was a belief that under these conditions, "social workers are more apt to get the information they must get, than the information they could get", and this would create some existential anxiety because "we know we're not doing the same work we could be, given … the space to do so." (Participant 29, personal communication, 18 April 2019). Purposes prioritized in CPIN did not align with some purposes that social workers felt were important.

Technology was also seen to influence the selection of outcomes and ultimately what would get measured. Workers noticed a difference between looking good on paper versus in practice:

> *for me, outcome … would be, 'does this child understand that, no, that he should not beat me like this, he can correct me and, no, I didn't do anything wrong and there are things I can do', and … did we empower the child? Is there somebody they can talk to? Somebody I can say, 'hey, this is happening to me'? We're not looking at that, because this is what the worker's saying, 'my kid's not ready', but we're looking at the plan of discharge because we are an agency who's interested in reducing the amount of time, numbers, that a child is in care. Okay, so … statistically, … we should be happier because we have a child who didn't stay in care two years. We have a child who's gonna stay in care for two months. But in terms of … growth or change mechanism, have we shifted anything? No. But,*

> *we're pleased with the numbers, right. (Participant 21, personal communication, 3 January 2019)*

It was clear to workers that the outcomes enabled by CPIN were not related to empowering children against abuse, but to reducing their length of time in care, again demonstrating divergent values. Outcomes were not related to how clients were doing, but to values such as finding immediate cost efficiencies. Similar connections between world and purpose were mentioned in the UK. Where one sits tends to change priorities, for example in a children's social care office versus a corporate office. What is important in one, may not be important in the other. (fieldnotes, 28 May 2020).

Standards embedded in technology and data expectations were creating anxiety for social workers based on feelings of inadequacy relative to the objectives they felt they should be achieving. These work conditions were not aligning with the self-interpretation that informed and ordered their activities. Standards were seen to undermine worker self-interpretations because they placed compliance over social work. Compliance with standards had become the measure of their worth, but it was not what they valued in their work. While being informs activity, for social workers, CPIN felt like it was for different beings with different purposes.

Overarching values that shape technology normalization

Part of this divergence in values could have been related to a higher-level shift from child safety to family stability and efficiency. A worker shared their perception that the sector was shifting away from child safety and towards service efficiency, specifically expressing their unease. The worker said, "Yikes. I'm a little bit nervous about where the pendulum is, is swinging. … I get a little bit nervous when we feel so much pressure to avoid bringing children into care" (Participant 13, personal communication, 5 October 2018). Their concern was that this external pressure to avoid bringing children into care may influence the decisions of workers with less experience. This worker specified that, "I'm just nervous that there is so much pushback, … I think there's a lot of people who have not been around long

enough to have experienced an inquest and how difficult and devastating that is when something horrible happens." (Participant 13, personal communication, 5 October 2018). This worker was very concerned about the tragic situations that can arise if child safety is not taken seriously. For this worker, the pendulum had swung too far to austerity, efficiency, and family integrity, and they experienced unease in their being, which held on to values of social work clinical judgement and perhaps also the prior privileging of child safety that had permeated the sector after some high-profile child deaths and the socialization that occurred during that period.

The worker did suggest that tragedies can be an opportunity for learning, saying that "there are a lot of good … changes in practices that can come out of something very difficult'" (Participant 13, personal communication, 5 October 2018). A supervisor shared this sentiment: "in tragic situations we learn, and … we have put policies in place now" (Participant 9, personal communication, 26 September 2018). Change in policies and practice are intended to ward against things that have happened in the past and ensure that things are done differently in the present. These changes embed learning in the background, but they may also lock in certain historically contingent purposes, especially if those policies are codified in information systems.

Some agencies interpreted this overall shift in values towards family support to fit with a child protection setting, promoting stable family life not to reduce costs but to deliver an effective service. Sarnia-Lambton Children's Aid, for example, set out in their strategic plan to have no children in care (see figure 18 below).

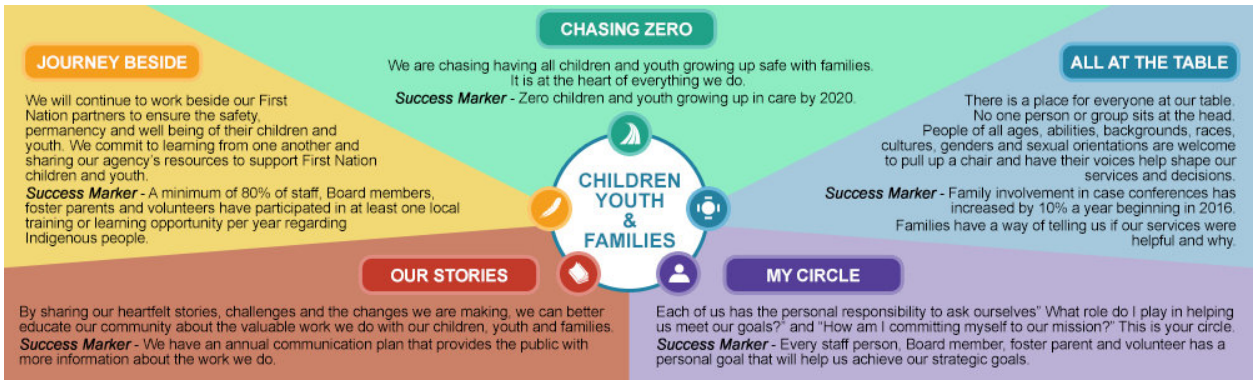


Figure 18: 'Chasing Zero': Sarnia-Lambton Children's Aid – Strategic Plan

Figure 18 is a screenshot from Sarnia-Lambton Children's Aid – Strategic Plan "Zero children and youth growing up in care by 2020". 21 September 2018. (from website banner) https://web.archive.org/web/20180921114704/https://www.slcas.on.ca/

These examples suggest that while the pendulum does swing, it leaves a tail behind, which can include tools and socialization with purposes tied to particular periods where different values were prioritized. The overarching values in different historical periods may influence the purposes underlying worker socialization at the time of their initiation into child protection, offering a potential explanation for the divergent worlds between generations of social workers. Workers socialized under child safety values may privilege those values over newer workers who enter the sector under values representative of the efficiency and family support perspectives. Amidst all of this, workers may be subject to policies and tools that represent either end of the pendulum's arc – with risk assessments and eligibility spectrum from a child safety period, but performance indicators from a family integrity and efficiency period. This history of change created a palimpsest of memory traces influencing activity in the present. Convention and socialization may exist underneath explicit guidance and incentives, where the explicit rationale has been forgotten, but the influence on behaviour has not, creating an uncomfortable coexistence in practice.

Under the banners of outcomes and permanency, differing values came into conflict between the ministry and social workers during the implementation of CPIN. The ministry upheld values of compliance with standards and cost-reduction or value-for-money and social workers held values up to and including solving the problem and attempting to make

the service obsolete. Only entirely different worlds with different purposes could produce these divergent interpretations of what values, outcomes, and purposes should be prioritized.

9.1.5. Being in a world also depends on equipment

This subsection specifically looks at examples of how equipment is related to the memory behind being and self-interpretation. It builds on some of the examples around trauma and disquiet briefly discussed in the previous chapter to show how CPIN highlights different purposes behind the worlds of system designers (the ministry and software developers) and system users (social workers), as observed through its impacts on practice. Technology can be used as a vehicle for purposes, but it may not be designed to coincide with the purposes of the worlds into which it is introduced. This section looks at how being can be disrupted when a newly introduced technology fails to become equipment, as illustrated by examples of system design and disruption. It also provides examples of recording requirements that showed a specific failure of the technology as equipment, where workers became aware that the technology was imposing values from a different world. Finally, it provides some examples of impacts on practice that illustrate how technology can also stimulate changes in the being of those required to use it.

System design and disruption

System design decisions and the impacts that they had on workers highlight how being can be disrupted when a new technology fails to integrate into practice as a piece of equipment. There were numerous examples where CPIN system design decisions clearly demonstrated to workers that the ministry and its developers did not understand their world. For example, with the combination of timelines in standards, system rules, and transfers between compartments, a worker could end up non-compliant before they received a case (Participant 9, personal communication, 26 September 2018). Workers found this focus on times, down to the minute, ‘disheartening’, ‘frustrating’, and ‘discouraging’ (Participant 13,

personal communication, 26 September 2018). There was also disruption around coverage. A covering supervisor needed to search manually for worker approval requests because there was no way to have them appear on the covering supervisor's dashboard (Participant 9, personal communication, 26 September 2018). Further, recording locations in CPIN did not always make intuitive sense to workers (Participant 13, personal communication, 26 September 2018). Finally, history search changed from being a part of clinical work to a piece of administrative compliance, where the focus was on finding potential records, rather than evaluating their meaning or relevance to a case (Participant 29, personal communication, 18 April 2019). When a technology is imposed from one world on another without sufficient attention to how seamlessly it will fit into the world it is entering, then the technology can disrupt practice and fail to become equipment.

Recording requirements and the imposition of values

Different worlds had different interpretations of what constituted outcomes and the recording requirements reflected this. One worker said, "we see the ministry trying to look at ways of how to measure our usage within CPIN", but "compliance doesn't always mean outcome" (Participant 9, personal communication, 26 September 2018). The focus was on recording, but this did not necessarily mean better outcomes for families. The worker went on: "I still think we're feeling like, is it really measuring the actual work and engagement that we're doing, 'cause I think we're doing really good work … but that might not show necessarily on a pull from a technological system." (Participant 9, personal communication, 26 September 2018). CPIN was not measuring things that social workers were interested in understanding, for example the quality of the work they were doing in the field. Outcomes measures ended up being about CPIN usage, not 'actual work' and engagement. Administrative data collection was privileged over clinical information, conditioning the being of social workers towards documentation for compliance and reporting.

Not only was CPIN privileging an administrative type of data collection, but the act of imposing such data collection was seen to reduce the space for social work practice. One worker said,

> *one of the issues that we're having is that … if people recognize that there's so much more work … to invest in CPIN, something's gotta give. You're only a human being and if you have hundred percent battery, more of the battery's going towards CPIN, what's happening with the social work piece? (Participant 21, personal communication, 20 November 2018)*

The worker went on to say, "that's why people are frustrated with CPIN because, yes, we realize that it requires an investment, but where does that come from if we only live twenty-four hours a day, … we have to give up something and it seems to be … the actual casework" (Participant 21, personal communication, 20 November 2018). More time was needed for documentation, and this came at the expense of direct contact with clients (Participant 10, personal communication, 26 September 2018). CPIN recording took more time and workers felt like they had to give up part of their identity - the casework. Similar disquiet had been observed in the UK (Broadhurst et al. 2010; Munro 2011).

CPIN was also shaping what was recorded and by extension what was done. One worker commented on the influence of CPIN on practice:

> *I know a lot of people, more so front-line, talk about it driving practice in terms of, like, you're not allowed to do something in CPIN, you know you can't do something out in the field. … CPIN doesn't allow you to do it, so you probably shouldn't do it out here, or if you collected something in the field and there's not a spot to put it in CPIN, then maybe you know you shouldn't have. So, I think a lot of people are questioning some things that don't fit exactly into CPIN whether or not, like, they should actually be doing something. (Participant 43, personal communication, 5 November 2019)*

CPIN was beginning to condition what workers did and what data they collected in the field. It was also causing agencies to adjust their policies and procedures. A worker said, "I think before, it was kind of like, … this is how our agency wants to practice child welfare work, and now, … we're kind of more like, shifting our policies and procedures to … align with what the system is able to accept" (Participant 40, personal communication, 4 November 2019). But this was not unique to CPIN because, legacy systems were seen to influence how workers

recorded case narratives (or whether they did it at all): “we talk all the time about how your legacy system really drove the way you do your narratives” (Participant 43, personal communication, 5 November 2019). Technology that becomes equipment can alter the world it enters.

Part of the problem with recording might be related to an underlying social worker antipathy to the documentation element of the work. In one agency, during a focus group conversation, a supervisor said the previous information system “was very complicated and ... it required a lot of assessment ... it captured all of the risk factors ... It was very comprehensive, but it was very detailed, right. And, as a result, workers’ recordings were never done” (Participant 15, personal communication, 25 October 2018). A front-line worker who was present interjected, “Was the system, not me, was the system” (Participant 18, personal communication, 25 October 2018), which made the other front-line workers in the room laugh. Administrative rules and procedures were elements of the previous information system, but they were largely ignored because, unlike CPIN, they were not tied to performance measures. A former senior public servant in the UK indicated that this might be tied to the being of social workers: “[t]hey don’t like recording, full stop.” (fieldnotes, 17 July 2019). They found that people had tried to feed information back to social workers, but these types of approaches had not worked when it came to improving their recording. (fieldnotes, 17 July 2019). One worker at Ofsted was pessimistic about technology in children’s social care, highlighting a challenge of reconciling competing objectives, saying ‘if it’s good for social workers, then its bad for administrators and analysts, and vice-versa’ (fieldnotes, 28 May 2020). In the case of CPIN, compliance was monitored publicly. The public monitoring appeared to be influencing the being of social workers in a way that the older agency-specific technologies had not been able to and this was challenging existing self-interpretations.

Impacts on practice and the 'green' worker example

In some cases, the technology did start to take on some characteristics of equipment, where certain components were fading into the background and subtly changing practice. One supervisor provided some examples of how CPIN was becoming more transparent in use. Speaking to their own experience, they said "I remember earlier on, … I'm struggling to figure out how to create new habits, right" (Participant 41, personal communication, 5 November 2019). However, embedding habit changes made CPIN more useful, for example CPIN gave supervisors a way to eliminate 'hallway supervision', because those interactions could be logged as case compliant meetings (Participant 41, personal communication, 5 November 2019). Further, this supervisor was also using non-compliance rates as a proxy for identifying workers dealing with difficult cases (Participant 41, personal communication, 5 November 2019). CPIN made it easier to see who was struggling with meeting standards, and supervisors could use this as a proxy to identify when a worker was dealing with a difficult case or caseload. While the supervisor had developed new habits, the supervisor explained, "I've seen some workers adapt and I've seen some workers that are still struggling with 'how do I change the flow of my work week?'" (Participant 41, personal communication, 5 November 2019). Normalization of the technology into equipment was not uniform. However, there was evidence that some workers were finding ways to integrate CPIN into their practice as equipment and consequently also the purposes embedded in it.

The visibility of breakdown was also beginning to subside. A records department worker said, "at first there was some impacts on behaviour, … people were pretty disgruntled about the system not working as well as we'd hoped. … but … people have just gotten used to it and just had to get on with it, go ahead and do their job" (Participant 42, personal communication, 5 November 2019). Evidence that some elements of the work were fading into subsidiary awareness emerged during observation as this worker said, during our walk-through of the system that "[y]ou don't really notice how convoluted it is until you're

talking to someone" (Participant 42, personal communication, 5 November 2019). While CPIN may have been frustrating, it was beginning to operate outside of awareness.

There was also a sense in which the visibility of individual compliance rates stemming from CPIN was encouraging workers to be 'green' or compliant workers and was normalizing this self-interpretation. CPIN made it possible to extract reports that could be processed and provided to workers to illustrate their compliance rates. One worker said that, "CPIN drives practice in terms of compliance. CPIN's gonna let you know if you're not compliant. Our old system didn't really do that". (Participant 43, personal communication, 5 November 2019). This change towards greater compliance with standards was shifting worker perspectives, and standards have been found to "shape the capacities that people have to build their own worlds." (Mulvin 2021, 6).

The following extract from fieldnotes looks at an instance of a worker seeking to be 'green' and provides commentary from other workers on this shift in practice.

> *After I observed a demonstration of a reporting tool to highlight compliance, a worker came into the meeting room and asked about a non-compliant file. They were worried that it was not green, and they wanted to be a 'green worker'. They were wondering how to get the late file out of the system. They said something about it being 400 days late. Participant 2 came back into the room. They discussed what the worker could do. The worker left. Participant 2 was worried that this worker would do certain tasks to satisfy the system rather than doing those tasks to provide a good service to the client. This branch was known for non-compliance. Participant 2 worried about the 400 days, it may have indicated that the supervisors could not be bothered to look at how their staff were doing, despite having received this tracking tool a year ago. With ongoing work between quality assurance and service teams, as well as the staff at that time having access to the system, more self-tracking was expected and compliance rates were anticipated to go up. (fieldnotes, 25 September 2018).*

Another worker from the same agency noticed that "now it becomes a competition. … who has yellows, who has red, who all has greens, you know what I mean. So, it is become … administrative more than … clinical, if anything". (Participant 17, personal communication, 30 October 2018). A supervisor at another agency noticed that workers were getting anxiety and somewhat obsessive about having all green files, even where technical issues prevented that from being the case (Participant 41, personal communication, 10 December

2019). But in some cases, workers were coalescing around the tool and helping each other when they had many non-compliant cases (Participant 37, personal communication, 4 November 2019). Overall though, as a general trend, a manager at another agency noticed that

> *as we are getting more and more reports, that's what changes people's behaviour. So, we know from our past experience that if we have a dashboard that workers could look at every day or every week, they could see lots of red on their caseload, and they would go in and fix their data and it would go green and everyone would be happy. And when we just rolled out our dashboard, within two weeks we had a 33% increase and improvement in data quality. (Participant 30, personal communication, 2 May 2019)*

The technology appeared to be influencing behaviour. For an example of a dashboard like that discussed by this manager, see figure 19 below.

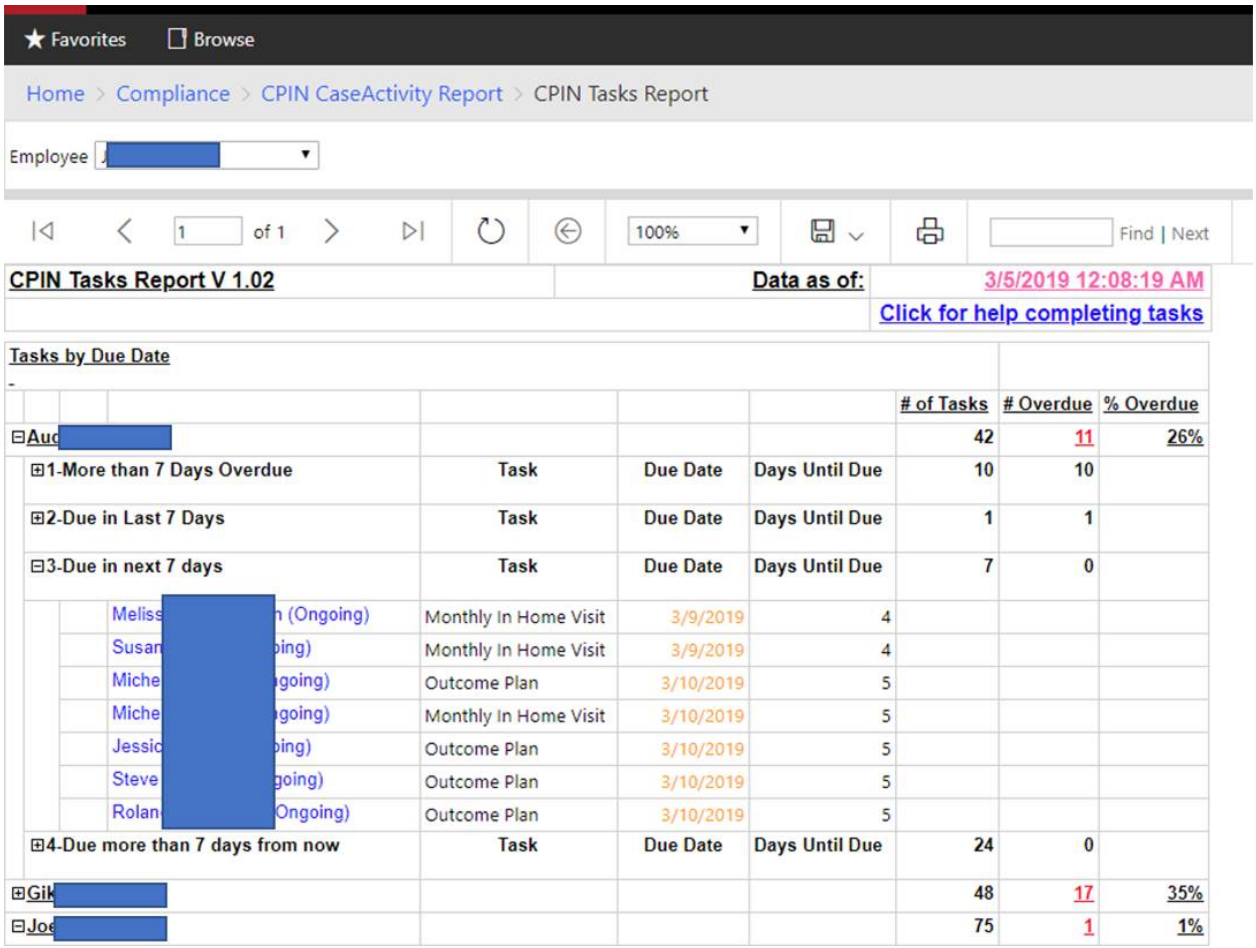


Figure 19: CPIN Task Report from SQL Server Reporting Services

In figure 19, you can see the overdue tasks in red, which can be broken down by worker. This screenshot from SQL Server Reporting Services was de-identified and shared by Participant 25 on 5 March 2019.

Some were positive about the change in behaviour towards better data quality. However, while the somewhat divergent responses suggest that the different positions (worker, supervisor, manager) and agencies might represent slightly different perspectives, overall, the quality of administrative data needed in CPIN for compliance was taking precedence over social work practice.

England appears to have dealt with similar problems earlier than in Ontario in relation to audit culture and IT driven performance management. Some scholars found that local authorities were using traffic lights and weekly graphs of levels of attainment and individual failures (Broadhurst et al. 2010), while another researcher found that the audit system was

dictating professional practice (Munro 2005). This research was done in the UK a decade earlier than Ontario and indicates that this implicit memory and its transformation through the interaction of worlds and technology may not be unique to Ontario. In both cases, the change in equipment, making performance public, led to a change in what it meant to be a social worker. The examples in this subsection illustrate how worlds can begin crumbling, creating feelings of discomfort from encroachment across boundaries. In this case, technology acted as a Trojan horse, allowing the administrative world, and the embedded memory around purpose and tool use, to infiltrate the world of social work.

9.1.6. Summary example of the five features of memory in being

The following example with a veteran worker who had moved from front-line work into supervision provides a synthesis of the five features of implicit memory embedded in being. This example builds on the findings presented so far and illustrates how things had changed after the introduction of CPIN using the case of agency parking lots.

The veteran worker suggested that the fundamental skills expected of social workers had changed over time. This worker found that, while the work remained similar, there were some differences stemming from technology. CPIN was seen as subtly conditioning what it meant to be a social worker (which was jarring for older workers, yet normal for younger workers). This worker was from a prior generation where there had been more fieldwork and where workers carried paper notebooks for recording. They had moved on to become a supervisor, but wondered if it would be possible to go back to front-line work given the technological changes and changes in expectations. The worker said, “I haven’t done it myself, front-line work, for so long, … to step into it right now would be kinda shocking, … I just couldn’t get away with going and seeing people working with people and making a few notes in my book” (Participant 24, personal communication, 4 March 2019). The veteran supervisor felt there would be an insurmountable disjunction between the practices and expectations then, and those under CPIN.

The veteran worker identified two phenomena around the socialization of workers. First, CPIN requirements were normalized for newer workers. This worker said, “people have been kind of introduced to … this and I think their joining the field in the last five years, this is all they know” (Participant 24, personal communication, 4 March 2019). And second, the nature of child protection work appeared to have changed with more desk work. This worker explained,

> *there’s a lot of data entry, and so you do see a lot of cars in the parking lot a lot and a lot of people sitting in their work stations and … there’s time that has to be spent on that … I’m thinking 20 years ago, would the parking lot be as full? I don’t know, maybe not. But some days here people are in and they’re trying to get their stuff logged in and entered. (Participant 24, personal communication, 4 March 2019).*

The parking lot was seen as evidence of practice change.



Figure 20: Parking lot – Family and Children’s Services of the Waterloo Region

Figure 20 is a picture of the full parking lot of a different CAS than that of the participant in the example and not one of the two agencies with formal observation. It is Family and

Children's Services of the Waterloo Region. It was taken by Thomas Vogl on 7 May 2019 when assisting with a workload study (volunteer work done with researchers from the University of Toronto and the University of Colorado in exchange for help with access).

This worker noted that this sentiment of more cars in the parking lot and more people sitting at their work stations was shared by other agencies: "I've heard that at a few different venues over the last few years … people making the observation, when you look out the window, with those of us who are in the office all the time, like me, … it's interesting how many cars are parked back there." (Participant 24, personal communication, 4 March 2019). Another worker from a different agency agreed: "it's moved a lot … from working outside of the office with families to more administrative now" (Participant 17, personal communication, 25 October 2018). There was not just one agency observing a change. It was collective. This example illustrates how purposes manifested in activities in the world. It also provided some indication about what a change in being might look like: more cars in the parking lot and more workers at their desks.

This parking lot example illustrates all of the characteristics discussed in this section. Another world (1) imposes a new tool (5) that influences self-interpretation (4) and reveals differences between types of workers (new, veteran) (1, 3) within social work where the data entry is normalized for new workers (3) and where these shifts are shared across workers and the sector (2). This example of characteristics of being also highlights how characteristics are not really independent, but are interconnected.

9.2. Concluding statement

This chapter looked at the features of memory embedded in being, as illustrated by examples from the research data on digital transformation in child protection. There was evidence of multiple overlapping worlds. Worlds were seen to be collective or shared insofar as they were responsible for socialization and this collective nature became visible when one world came into conflict with another, such as when new technologies originating from a different world disrupted prior understandings. Worlds operated in the background insofar as

they, and the technologies within them, formed the environment into which newer workers were socialized. Being in a world depended on a purpose. Purposes could be disrupted by new technologies and their associated values when they entered the world and impacted the capacity to pursue those purposes, which created anxiety or altered the purpose. Being in the world also depended on equipment. When what was designed to be equipment failed to fit in with practice, then the memories underlying ‘correct’ activity came to the fore and highlighted divergent self-interpretations.

Based on these findings, being-in-the-world as a form of memory has five key features: (1) memory in worlds is at the foundation of being or identity: it is the context within which performance of activity occurs; (2) this memory is shared by a collective and is socialized into new members; (3) this memory precedes being and operates implicitly and largely in the background; (4) the core of this memory is a purpose, or a self-interpretation, that gives order to the activities associated with that identity; and (5) being a certain identity is manifested in practice through a combination of memory of purpose and the memory of how to use equipment. The entry of a new technology can send ripples through the background world and alter being (intentionally or unintentionally).

Overall, these findings suggest that the skills and expertise required by social workers were changing and that this was, in part, driven by the technological tools they were given, the administrative standards that were embedded in them, and the data elements they were expected to collect. In this sense, implicit memory is subject to transformation and re-interpretations in response to new experience, such as the introduction of new technology in a context with multiple overlapping worlds. We also saw that the memory of purpose embedded in a world can be displaced by technology, forcing users to re-establish identity under foreign purposes. These identity changes could be the exercise, either intentional or not, of bureaucratic power, as Weber suggests that it is exercised through knowledge in official documentation (1968) and this is exactly what the technology appeared to prioritize. It

created situations similar in kind to those encountered in the private sector: "The superintendents often complained about the number of reports demanded of them, no doubt both because time was required to make out such reports and because the organizational memory these reports created enabled headquarters to evaluate their performance more specifically" (Yates 1990, 179). Worker frustrations with CPIN and the feeling that what was measured came straight out of a factory may have been justified.

A phenomenological perspective on practice, of people with identities using equipment to achieve objectives, has been relatively neglected from discussions of organizational memory, but could help to explain why there can be a divergence between what is remembered explicitly in data or stories and what is remembered in practice. This perspective could also overcome limitations in the traditional Cartesian perspective on memory. Traditional approaches to memory are limited because they interpret people as subjects, their tools as objects, and the interaction between them as cognitive information processing. Memory that extends beyond subject-object and cognitive information processing interpretations offers a means to explore more phenomena.

In terms of the puzzles, digital technology does not provide a ‘perfect memory’ because what it explicitly stores is not all of memory. In this case, the Cartesian perspective failed to account for world and purpose and in so doing allowed a new technology to displace elements of the world and purposes of social work for elements of the administrative world and purposes of the ministry. Digital technology only perfectly preserves those aspects of memory that can exist within it. Further, the idea of a ‘perfect’ digital memory (Mayer-Schönberger 2009) assumes that memory is explicit, that implicit forms either do not exist or are not important, and that memory is reproduction, not reconstruction.

The idea of implicit memory about purpose in a world also helps to resolve the puzzle about how you can have amnesia and inertia or forgetting and remembering at the same time. The solution is in the interplay of forms of memory. The explicit history behind an

approach (why something is done) can be lost, while the purposes and identities individuals are socialized into ensures the activity persists. Similarly, practices may change in response to a shift in background purpose, while established data elements (like those in risk assessments) may continue to be collected, processed, and used. In this chapter, we saw how in the shift from child safety to family integrity, while the history was not always obvious, it remained present in the tools and practices. We also saw how the being of social work was changing towards compliance while aspects of the data collection underlying compliance remained the same (focusing on administrative over client or clinical objectives).

In terms of the unintended consequences of technological change, the examples in this chapter and the form of memory suggested by them, highlight how, in the absence of efforts to understand the equipment, self-interpretations, and practices in a given context, the background memory from one world can become unintentionally and invisibly embedded in a technology that is destined to be used in other worlds. This can cause a period of disruption that is either unresolvable, or that fundamentally shifts the self-interpretations that are possible in those worlds. These shifts and misunderstandings can undermine the functionality of the technology across worlds and its ability to achieve desired objectives while also altering practice in ways that might not have been intended.

Chapter 10: Discussion

This thesis set out to enhance our understanding of the unintended consequences of information technology change in child protection services through the lens of organizational memory. It sought to illuminate how digital change could be accompanied by forgetting and how such organizational forgetting in one area could be concurrent with bureaucratic inertia in another. This was motivated by the perception of persistent memory inadequacies in front-line and administrative oversight and decision-making. Examples of these issues included memory not being available in cases of high-profile child death (OCC 2014; Laming 2003), and concerns about the accuracy and reliability of administrative data for oversight, despite changes in standards, tools, and technologies (OAGO 2015a; Ofsted 2018; Lemay 2011). Focused and theoretically informed field research in child protection organizations called into question the completeness of existing theories of organizational memory. It suggested that there might be novel forms of memory grounded in Heidegger's fundamental ontology that could help to resolve the puzzles. The extension of the typology of organizational memory offers new avenues for inquiry in organizational memory studies and the study of information technology in public administration.

This section begins with a final vignette which illustrates how the different forms of memory interact and the ways in which they can be encountered in practice. It then provides a summary of the findings in each of the five substantive chapters. From these findings it offers solutions to the two puzzles, grounded in the interplay of different forms of memory, and in so doing, a way to understand different unintended consequences of information

system change in child protection. It concludes with some general implications for organizational memory studies and information technology in public administration, and suggests some future areas for research.

10.1. Forms of memory: summary vignette

This section provides an example from the fieldwork to illustrate each of the forms of memory, how they manifest, and how they are all interlinked. This example involved the creation of an ‘educational shell’ in the Child Protection Information Network (CPIN), where a child’s educational information and attachments could be uploaded. This example involved an interaction between an older worker nearing retirement (participant 18), the case management system, and a younger worker (I did not have the younger worker’s consent for recording, so only a description of the interaction is provided from my fieldnotes). In dialogue, I am abbreviated to TV and the older worker is abbreviated to P18. Excerpts from this single extended example are separated out using text boxes and are followed by descriptions stating their relevance.

> P18: I have to do an educational shell for one of the children. [mouse clicking, typing] … I don’t know if this is interesting for you, but, to show you how complicated this could be when you don’t have the ability, or when you don’t do this [frequently]. ‘Educational shell needed’. (Participant 18, personal communication, 31 October 2018)

CPIN embeds rules for recording that people in child protection roles are expected to remember. However, when the activity is infrequent, they forget. This excerpt shows that complicated rules embedded in CPIN and the procedures for accurate data entry challenged the memories of some workers when they were trying to complete their recording, illustrating the interplay that can exist in the static mechanisms of memory storage between rules, roles, and records. This also illustrates how there is an element of personal knowledge, subsequent breakdown, and worker anxiety.

TV: So, what is an educational shell?

P18: Please see below [throws pen on desk]. … I don't know. … [mouse clicking].

(Participant 18, personal communication, 31 October 2018)

Faced with CPIN's insufficient in-built clarity and guidance about how to complete tasks, this excerpt shows how this worker expressed frustration with the information system, throwing the pen on the desk, a physical expression indicating that this information system did not feel like a familiar piece of equipment. The information system was the focus of attention, instead of the task of recording the children's educational information.

TV: So, is this a space where a specific type of document can be uploaded?

P18: Yes, yes. You have to have it first. Ah, yeah, yeah, yeah, I know it. Now I know.

TV: And it's not in-built to the system?

P18: No.

TV: The space doesn't exist. You have to make it?

P18: You have to create it. Yeah. And I, yeah. … [picks up pen and starts writing on notepad]

TV: What information are you taking down now?

P18: The names. The names of the children.

TV: Because you have to do a search for them later?

P18: Because I need to know the name of the child that I am going to do the educational shell [for].

TV: Okay. Because you can't access that information once you're in the interface trying to do it?

P18: No, no. (Participant 18, personal communication, 31 October 2018)

This excerpt illustrates how the information system could create periods of disruption, but workers would recall experiential elements of the task and fall into everyday practice

using ready-to-hand equipment. The notepad was the clearest piece of equipment for this worker. It was an invisible and familiar tool that this worker used to complete everyday tasks, which, in this practical context, involved taking down names to be able to more easily navigate to the relevant fields in the information system. It was a workaround to allow CPIN to function as equipment. With a familiar tool for remembering things, the worker and the notepad became one in practice in order to gather the information needed to complete the educational shell. This speaks not only to the memory stored in recording, but to a type of implicit memory about how to carry out certain tasks and what tools are needed to do so. It illustrates a memory underlying action in CPIN.

The worker was unable to remember all the steps needed to create the educational shell.

P18: [picking up and dropping pen, mouse clicking] Okay. [mouse clicking] Now you have to look here. Who's? … Okay. Let's, young people, basically.
TV: [laughter] (Participant 18, personal communication, 31 October 2018)

My participant walked over to another cubicle and invited a younger coworker to help create the educational shell. They walked back together, the older worker sitting back down, and the younger worker leaning over from behind to take the mouse and navigate to the appropriate location in the interface. There was an education tab under the background section of the person file. In that tab, an entry for the school needed to be created, then it was possible to upload education related attachments. Without this tab, workers could erroneously upload education documents to the 'general' attachments tab. Creating a situation where records could get 'lost' insofar as they were not in the place where workers would expect them to be. While the younger worker was inputting information, everything was lower case. To complete the shell, the younger worker looked up the school address using Google search, switching between applications (web browser

> and CPIN interface). Once the shell was created, the coworker left (Fieldnotes, 31 October 2018).
>
> While the educational shell had been created, there were still some school details that needed to be filled out. My participant tried to create a new tab in the web browser, as the coworker had done, but could not remember how to do so and ended up asking me (Participant 18, personal communication, 31 October 2018).

This excerpt presents some issues related to processes of organizational memory. During this interaction, I learned that it was possible to upload education attachments to the general file, but then it might be difficult to find them because they would not be in the location where a worker would expect to find them based on harmonized practice rules and norms. In this case, the location where attachments were uploaded was user dependent and not constrained by the system, which could lead to retrieval issues. Further, it was not possible to select a school from an existing pre-populated list. Address information needed to be input manually. This pushed workers to use familiar tools, like Google search, where ostensibly that company could gather sensitive information about children and families involved in the child protection system (given that Google can likely identify the children's aid society and its workers from trace data). When manually inputting school data, there was also room for typos, capitalization errors, spaces, and other things that would make analysis of string variables very difficult. In fact, when I was looking at one of the person files with my participant, I noticed that a middle name appeared to be misspelled, with two letters reversed (Fieldnotes, 31 October 2018). I imagine this could lead to missed records during routine search, duplicate record creation, and problems accurately aggregating data at the administrative level. In terms of processes, there was nothing preventing workers from collecting data inaccurately or in the wrong areas. Information could be missed, even if it

were stored. These were issues that could constrain the benefits of static explicit memory in the information system.

In this excerpt, I also noticed that some staff took on the role of system experts and would become go-to people for the organizational memory needed to navigate the less commonly used elements of CPIN. Memory was stored in the dynamic interactions and conversations they had when helping others to navigate the case management system. The worker who was invited over to help was younger and only had experience working in CPIN. This person had facility working not only in the information system interface but also online when searching for school information, combining technology and their own knowledge in a dynamic memory process. Further, these two workers represented individuals whose backgrounds, though both from social work, show differences relative to familiarity with tools, but also potential differences relative to socialization into the goals and final points of the social work profession, with the older worker showing resistance to the new information system and its logic, while the younger worker took that logic for granted in the conduct of everyday work. CPIN seemed to operate more as equipment for the younger worker. This suggests that even different people within the same profession may differ intergenerationally and that these workers might inhabit different worlds that privilege and support different types of equipment and implicit objectives when carrying out the same tasks.

In this example, there were insights about different kinds of organizational memory: the explicit mechanisms and processes, tacit conceptual frameworks, as well as the implicit phenomena of organizational memory. In terms of mechanisms, there was evidence of data entry errors in records. System rules made it difficult for some workers to remember where to find relevant information. There were also rules outside the system to provide guidance, but it was often easier to find coworkers in similar roles, often younger, who could remember and transfer memory dynamically. This example also illustrated some implications of CPIN on collection, around remembering the appropriate way to complete recording, or ensuring

the accuracy of data collection. It also illustrated how some workers may lack the personal knowledge about the logic of the information technology, preventing them from using the information system without assistance.

Finally, from an implicit perspective, observation of practical activity revealed that the worker took notes *in* their office *with* a pen and notepad *in order to* gather relevant information needed to create an educational shell as a step *towards* completing case recording *for the sake of* being a good social worker. Where being a 'good' social worker was tied to both providing and recording services, where keeping children safe and families stable and recording details of interactions for future reference are the purposes that order activity. In this involvement whole, wherein being a social worker with specific purposes makes sense, CPIN is part of an equipmental whole that also includes things like notepads, and is given meaning by the purposes underlying its use. This illustrates the importance of purpose and the interactions of equipment in this world. However, during the course of this work, while the notepad was a familiar piece of equipment that vanished in the task, the CPIN interface disrupted the flow of this worker's practice, requiring problem solving with the assistance of a younger worker, who was able to achieve practical flow within and around the interface. This suggests that the memory embedded in the overlapping worlds surrounding professional socialization has changed over time, influencing worker familiarity with information technology (IT), the extent to which IT represents their equipment, and the part that IT plays in shaping expectations about what it means to be a social worker.

10.2. Summary of findings about each form of memory

These technological transformations, with CPIN and predictive analytics, are analyzed through the lens of organizational memory because the problems these digital solutions were trying to address involved finding and using information from the past to improve decision-making. However, looking at organizational memory from a strictly information processing perspective failed to account for unintended memory-related issues

within organizations. The understanding of organizational memory was revised to include more phenomena, thus capturing the related changes in identity, accountability, technology adoption, and learning that were observed during the research. The following five subsections provide summaries of the different forms of memory. The final subsection describes the revised typology of organizational memory and its implications.

10.2.1. Static explicit memory

The chapter on static explicit memory discussed the place of rules, roles, and records in organizational memory. It looked at examples of static explicit memory in the sector, the importance of integrating and sharing it, and its place in predictive analytics. It looked at records and challenges to the processes of remembering (suggesting it is not just retrieval); explored how rules, code, and workflows disrupted practice; and showed how role compartmentalization impacted work with clients. Examples showed that static memory is not the entirety of memory in an organization, suggesting that there were other forms of memory that influence what organizations know, specifically, through dynamic and tacit memory. Without understanding other forms and their interactions, any attempt to use static explicit memory for service, operations, administration, or evidence-based policy making may not achieve set objectives.

10.2.2. Dynamic explicit memory

The chapter on dynamic memory discussed the place of inter-agential communication in organizational memory. The chapter presented areas of applicability through examples of workers and teams sharing stories about how to search for history using the suite of existing and legacy information technology in the organization, as well as by exploring technologies that better support or enhance narrative understandings and interpretations of cases and services. The chapter illustrated limitations and gaps by presenting examples of how narrative memory could be utterly divorced from realities on the ground, for example how ambiguous narratives could hide nuanced understandings of

existing situations and allow for those nuanced understandings to be forgotten in favour of preferred interpretations. One example was when thinking about data integration and availability, whether this meant temporally or spatially between organizations or sectors. These limitations suggested that the interpretation of static memory can be contingent on dynamic processes. We also saw how dynamic memory was unable to adequately explain phenomena such as concepts and categories that structured thought, the memory embedded in tools, and the practical contextual experience that guided what different people and groups prioritized in their work.

10.2.3. Tacit memory

The chapter on tacit memory discussed the idea that there are conceptual frameworks behind knowing, doing things, and expressing one's identity through skillful performance. The chapter looked at how tacit memory is related to instances where we are engaging in knowing activities, where knowing is characterized by separation of subject and object, where objects are understood in terms of particulars that describe them, and where we represent reality to one another. In the typology proposed in this thesis, the word 'tacit' is reserved for the knowledge focused phenomena underlying explicit and dynamic memory. We also saw that tacit memory might be amenable to processing by digital technology, such as in cases where artificial intelligence is used to process decompressed data (like video) and find patterns for interpretation (Dunleavy and Margetts 2023). It also might influence how people interact with data and technology (through the alignment between the categories and frameworks of users and designers). Acknowledging that there is tacit memory is important, and it does add to the explicit memory perspectives; however, the idea of tacit knowing subordinates ways of being to ways of knowing. While tacit memory relates to thought, there appear to be other forms of memory related to action and identity.

10.2.4. Implicit memory related to equipment

The chapter on equipment was the first describing the novel form of implicit memory based on fundamental ontology. Through fundamental ontology, a new way of understanding implicit memory and experience opened up, one that could help to make sense of the limitations, unintended consequences, and future direction of technological change in public administration. This chapter looked at how tools in use have a different ontological status than tools as objects. It also discussed the idea that there is an invisible form of memory associated with tool use that is made up of the norms, affordances, purposes, and interactions with other tools and context that make that use meaningful and intelligible. It looked at some examples of how workers use tools to get things done in a child protection setting. It highlighted how this form of memory operates behind practical activity and how this activity can be disrupted and reconfigured by the introduction of new technology. Specifically, it looked at what the introduction of a technology that causes disruption and breakdown in practice can tell us about what workers want in an ideal tool and how this relates to memory. Workers wanted technology to enter the workplace as equipment, get out of the way, fit with other equipment and the work context, support social work purposes, and align with existing skills and norms. The key elements of this form of memory are that there is a pre-existing consensus understanding of how to use tools and a pre-existing body of infrastructure that precedes effective tool use. Together, these make the skilled use of that equipment possible.

The distinction between tool in use and tool as object of attention helps to expose how information system change can have unintended consequences for organizational memory by transforming not only how things are done, but what gets recorded and in what way. A new form of memory grounded in equipment allows for divergences between what may or may not be remembered in activity and what may or may not be forgotten in explicit records or dynamic intersubjective communication. It also shows how digitization does not in

itself improve memory by better ordering and preserving explicit memory, but that this is dependent on how the instantiation of digitization, the tool itself, fits in with the worlds of existing practices and tools.

In the case of CPIN, many of the features of equipment broke down in the shift to a new information system. The new tool did not immediately integrate as equipment, as workers found themselves attending to many aspects of its use. There were breakdowns as some workers had their existing background understandings completely overturned. Norms for use had to be re-established, some purposes seemed foreign or abandoned, connections to other tools were altered, and this made CPIN very visible to workers. Examples showed how a new tool could be unsettling because its characteristics did not align with what social workers saw as essential to their being. However, examples also showed that the introduction of a new technology could begin to shift the background and change identity. There were efforts to normalize the system and some workers were acknowledging that operating in the system was becoming more automatic. However, examples showed that a certain disquiet seemed to persist among these workers despite the apparent reconfiguration of practice. Much of this related to what workers felt it meant to be a social worker and what they felt the information system was conditioning them to be. This points to another form of memory embedded not just in what we do, but in what we are, how we self-identify, and what ultimately guides our activity.

10.2.5. Implicit memory related to being-in-the-world

The chapter on implicit memory related to being-in-the-world looked at the ways in which memory can be embedded in the self-interpretation, or identity, and associated purposes that order activity within a world. There was evidence of multiple overlapping worlds in Ontario child protection between organizations, departments, functional areas, and generations of workers. Worlds were seen to be collective or shared, insofar as they were responsible for socialization, and this collective nature became visible when one world came

into conflict with another. Worlds operated in the background insofar as they, and the technologies within them, formed the environment into which newer workers were socialized. This background status was foregrounded with the introduction of new technologies that disrupted prior understandings of the world workers were inhabiting. Being in a world depended on a purpose and this purpose was disrupted by new technologies and their embedded values that entered the world and impacted the capacity to pursue that purpose, which created anxiety or altered the purpose. Being-in-the-world also depended on equipment, and when tools that were designed to be equipment failed to fit in with practice, then the memories underlying ‘correct’ activity came to the fore and highlighted divergent self-interpretations. Examples illustrated how overlapping worlds could experience shifts in background memory across organizations over time (through technological and intergenerational changes). We also saw that the memory of purpose embedded in a world could be displaced by technology, forcing users to re-establish identity under foreign purposes. In this sense, implicit memory could be subject to transformation and re-interpretations in response to new experience, such as the introduction of new technology, particularly in contexts with multiple overlapping worlds.

10.2.6. An extended typology of organizational memory

Findings suggest that social work identity was evolving and that this was, in part, the result of technological change. We saw how bureaucratic knowledge began to infiltrate and enframe the world of social work and how this could lead to unintended consequences. We cannot fully understand these consequences until we revise our understanding of organizational memory. This allows us to understand that a technology may not fit because of its embedded assumptions from a different world, that data may not be objective, but unique to the perspectives in a particular world, that the worlds of central administration might differ from the worlds of front-line work, and that there might be intersecting and overlapping worlds within these worlds. These novel forms of memory add a wrinkle to the

overly smooth interpretations of organizational memory. An ontological perspective on organizational memory that highlights people with identities using equipment to achieve objectives within different worlds, offers a means to explore more phenomena and, in the context of this thesis, helps to resolve key puzzles and problems.

The following table shows the extended typology of organizational memory, including how the forms of memory presented in the substantive chapters fit in with Heidegger's modes of being. Some examples of each form of memory are also presented.

Table 7: Extended typology of organizational memory

Ways of Being	Forms of Memory	Memory Mechanisms/Examples
Traditional Perspective on Organizational Memory		
Present-at-hand	**Explicit - Static**	Law, standard operating procedures, cases, principles, code, algorithms, job description, performance development plans, guidance, automation, post-it notes, paper files, electronic records, text, drop-down menus and check boxes, administrative data, transactional meta-data
	Explicit - Dynamic	Stories, conversations, interpretations, communication
	Tacit	Conceptual frameworks, subsidiary awareness behind the focus of our attention, classification and categorization, and institutions
New Perspectives on Organizational Memory		
Ready-to-hand	**Implicit – Equipment**	Embodied memory, interdependent equipment, memory traces
Dasein	**Implicit – Being-in-the-world**	Activity ordering self-interpretations, practices, shadowing, routine, mētis, professional identity, socialization, occupational environment

10.3. Solution to the puzzles and understanding unintended consequences

What this evidence and this typology of organizational memory permit is a solution to the puzzles set out at the beginning and a clearer understanding of the unintended consequences of information system change in child protection. Pollitt characterized the first puzzle as the paradox of increasing informatization accompanied by institutional forgetting: "[i]t is one of the paradoxes of our age that, while new information technologies have provided us with the ability to store, retrieve, manipulate, and communicate more data, faster than ever before, at the same time many of our public institutions seem to be losing their memories" (Pollitt 2000, 5). He characterizes the second puzzle as bureaucratic inertia combined with forgetting the past: "forms of cognitive and behavioural conservatism can certainly co-exist with a quite radical loss of touch with the past." (Pollitt 2000, 8). While the historical past can be forgotten "many organizations have great difficulty forgetting, or letting go of, precepts and standard operating procedures which are no longer serving them well. They go on doing things the same way, although the environment around them may have radically changed" (Pollitt 2000, 6). Our puzzles are about forgetting where we would expect enhanced remembering and remembering and forgetting at the same time.

In the first case, the problem arises when organizational memory is taken as coextensive with only the static explicit memory that information systems encode, collect, or process. As we saw from the examples, there were instances of digitization and forgetting, such as with duplicates illustrating the difficulties of the search process, migration and missing information illustrating divergent purposes, proper documentation procedures and how information nevertheless could end up in the wrong places because of different interpretations of the norms of use, and role compartmentalization where the focus rested not with the client experience but the formalized process. Interpreting organizational memory as the processing of information fails to account for this puzzle of perfect digital memory and

forgetting. Focusing on data or information fails to account for some of the dynamic, tacit, and implicit memory infrastructure that composes this environment. Putting information processing in the context of other memory kinds, such as implicit memory, provides a means to make sense of otherwise paradoxical instances of forgetting in the context of digital remembering. Not everything of relevance ends up in the digital repository and some of this memory that exists outside the information system influences what gets remembered in, or by means of, the information system.

In the second case, the problem arises when memory is taken as unequivocal. How can you have forgetting and remembering at the same time? With different forms of memory it is possible for a practice, an activity, to persist while records or history related to that practice are forgotten. There is a limitation in solely looking at a single form of memory. As we saw from the examples of explicit memory, there were failures to update documents because of misalignments between documentation and practice, and when old recording was moved into new places there was always a risk of something getting lost in the absence of expertise in navigating the palimpsest of information systems. Old ways of *doing* things persist in organizational life alongside forgetting about the stores of explicit memory, both the static records and their dynamic elements, that we *know*.

With this extended organizational memory typology, it is also possible to identify cases where there is data stability with underlying and not always acknowledged practice change. What Works for Children's Social Care found that the meaning of stable data elements changed sufficiently over time that they were unable to use historical data effectively in their predictive models (Clayton et al. 2020). Some respondents working in the US have suggested that even before digitization, paper risk assessments have deskilled child protection workers, leading them to believe that predictive analytics is the only solution to improved accuracy, as there is little to no professional expertise remaining for alternative technological tools to enhance (fieldnotes, 12 May 2021). This illustrates the persistence of a

risk assessment (scores and procedures) with an accompanying deskilling, or forgetting of professional practice (fieldnotes, 12 May 2021). Other researchers have also noted the inertia of measured outcomes and the underlying work they represent, with the constant churn of policies and information systems (Gilbert et al. 2012). This typology helps to acknowledge and more effectively interpret additional memory phenomena.

These solutions to the puzzles based on a revised conceptualization of organizational memory allow for an enhanced understanding of the unintended consequences of information system change. Under Pollitt's reading of institutional memory (2000), the consequences of institutional amnesia are poor policy learning (such as the JB inquest dissonance between problem and solution), vulnerability to fashionable solutions (such as customized off-the-shelf digital tools), costly attempts to transfer policy a-contextually (such as Cúram's move from SAMS to CPIN in Ontario), failure to value staff knowledge (such as standards versus narrative and compliance versus expertise), and inconsistencies and discontinuities in dealing with service users (such as with compartmentalization). The only way to understand these potential consequences is by means of a robust understanding of organizational memory that includes not only explicit and tacit forms, but also implicit forms that emerge from an interpretation grounded in fundamental ontology.

The table below provides a way to visualize potential memory paradoxes based on the typology. It presents four examples to illustrate the relationship between a puzzling phenomenon, the related forms of memory and whether it involves remembering (R) or forgetting (F). This way of visualizing memory impacts could be useful in future research, but might also need a time dimension to account for changes in the aforementioned relationships.

Table 8: Different possible types of remembering and forgetting

Example (Theme)	Static	Dynamic	Tacit	Equipment	Being
Inquests and divergent interpretations of data integration (Accountability)	F (recommendation)	R (consensus narrative about integration)			
Off-the-shelf technology designed for a different sector (Adoption)	F (written guidance)		F (the logic of workflow in CPIN	R (tools used to complete social work)	
Embedding a new information system in practice (Learning)		R (work-arounds		R (new norms of use)	F (focus on service in the field)
'Green worker' example (Identity)	R (Risk scores and compliance metrics)				F (Social work expertise)

This revised typology of organizational memory provides a better understanding of why there might be unintended consequences of information technology change related to the differential impacts of explicit memory on people inhabiting different worlds. The methodological approach adopted in this research allowed for a deep interrogation of why we fail to understand one another, what that means in the context of decision making with differential impacts on different groups, and how these misunderstandings are exacerbated or made visible through networked information technology, artificial intelligence, and data science. The ideas of equipment and world can help to explain divergences between intention and practice.

10.4. Relevance of this typology of organizational memory for other debates

The different forms of memory proposed here have implications for the study of technological change in public administration, information systems, organizational studies, and child protection, particularly around issues of data, analytics, and artificial intelligence. First, there are cogent limitations on the scope and application of data and artificial intelligence that can be better understood through the lens of these forms of memory. Second, there are novel theoretical constructs enabled by this interpretation of organizational memory that can help to better make sense of the unintended consequences of information system change. This section will revisit some of the topics in the literature review, but through the lens of the extended typology of organizational memory.

The problems of artificial intelligence, like predictive analytics, in management, public administration, and child protection are due to its epistemological focus. Scholars in public administration describe the features of artificial intelligence: "it can utilize input data with speed and dimensionality that vastly outstrip human cognition; and … as more data become available, it can “learn” and adjust its behavior by updating its decision heuristics’" (Criado, Valero, and Villodre 2020, 453–54). Input into AI is always a representation and the

reference to human cognition speaks to the prevalence of the computer metaphor of mind. It only looks at knowledge and cognition and ignores other things that might be at play. Some suggest that algorithms can replicate tacit knowledge acquisition: "At first sight, algorithms can copy the ways in which tacit knowledge is acquired by public employees in knowledge-based organizations, including public administrations, and this may affect personal discretion of the worker to take his/her own decisions" (Criado, Valero, and Villodre 2020, 454). However, it might only be able to highlight the tacit dimension, which people will still need to interpret. Further, focusing on tacit phenomena only in the context of knowledge excludes the types of phenomena that exist outside of an information processing focused perspective. The epistemological focus requires interpreting each person as "an information processing device" (Dreyfus, Dreyfus, and Athanasiou 1986, 205). Here we see a belief that AI could 'copy' tacit knowledge acquisition, but it would still only have access to knowledge, not necessarily the understanding needed for doing and being.

There is sometimes a belief that AI and humans have access to different information when making decisions (Kolkman 2020), which may be true, but this is a naïve perspective insofar as humans can draw on more than information (including the experience and understandings from their world and their being in that world). One scholar suggests that "combining analyst judgement with algorithmic model outputs - when the users have access to information that the algorithmic model does not take into account- leads to better outcomes" (Kolkman 2020, 2). This perspective focuses on cognition rather than being in the world – it ignores how humans process far more than any algorithm could, and how the defined conceptual structures surrounding algorithms may give them the appearance of better performance, when, in fact, it is solely in relation to pre-set quantifiable standards and not being-in-the-world.

Those optimistic about AI are also generally aware of the risks and seek to ensure that there is sufficient oversight of algorithmic models. Some scholars have suggested that

"AI systems are an improvement on democratic governance (i.e., accountable decision making or exercise of discretion) only as long as the assumptions on which they are operating are known and under control." (Barth and Arnold 1999, 343). What the findings in this thesis suggest is that many assumptions are understood and not known and are largely invisible and thus not amenable to the types of control imagined. Expanding the theory of organizational memory could pose new risks for the ethical use of AI (Leslie 2019; Leslie et al. 2020), especially if memory that is taken for granted and that typically operates in the background is baked into model outputs before there is adequate interpretation of the model design, assumptions, targets, and inputs.

In some circles of management thinking, there has been a level of modesty around the limitations of quantification and measurement: “We must realize, however, that we cannot put on the computer what we cannot quantify. And we cannot quantify what we cannot define. Many of the important things, the subjective things, are in this category” (Drucker 1967). It is not just subjective things, it can also be the interpersonal, collective, and equipmental. There are many phenomena that are not or cannot be quantified or adequately reproduced in quantified terms, and with AI, there is always a goal, but never a purpose. All our quantifications are proxies for phenomena in the world (Mulvin 2021). Developers decide the input data in consultation with their clients. In the public sector, the client is typically some administrative apparatus. The input and output variables all have to be explicitly spelled out. The data that the AI is fed is always cooked (Bowker 2005; Gitelman 2013) and is always a simplified translation of the world (J. C. Scott 1998) – doubly simplified as it is processed by the administration and then processed again into digital form, like the way digital imagery is transformed and compressed from a phenomena in ‘the world *out there*’ to electronic signals that are processed by a computer (Mulvin 2021).

This suggests that there are certain limitations that AI faces when processing inputs, insofar as they are transformed representations of a ‘world out there’. Dreyfus says that,

“attributing functions to brute facts couldn’t capture the meaningful organization of the everyday world” (Dreyfus 2007, 248). Further, as we saw earlier, “Heidegger’s important insight is … that *being-in-the-world* is more basic than *thinking* and solving problems; it is not representational at all.” (Dreyfus 2007, 254). This perspective has implications for discussions of data science, AI, and predictive analytics in child protection services, as it demonstrates the limitations of the inputs that AI is processing, mainly digital representations of the world – even if, like video, they are highly detailed representations, compared to structured databases or compressed data. Machines are not in-the-world the way people are in-the-world and the framework of organizational memory proposed in this thesis provides a means to better understand these limitations. According to Dreyfus and his co-authors, "[i]f we fail to put logic machines in their proper place, as aids to human beings with expert intuition, then we shall end up servants supplying data to our own competent machines. Should calculative rationality triumph, no one will notice that something is missing" (Dreyfus, Dreyfus, and Athanasiou 1986, 206).

In terms of the unintended consequences of information technology change, when the world is understood in terms of knowledge, reality, and technology, then there is a risk that a narrow, biased, and simplified vision of what is ‘correct’ may be imposed across a socio-technical system, when it may not be universally applicable to the inhabitants of the worlds it impacts. As a result, it can have a disruptive influence on accepted norms. The imposition of a simplified version of what constitutes ‘correct’ behaviour has parallels to the ideas of instrumentarian power and social physics in the broader study of organizations. Instrumentarian power “knows and shapes human behavior toward others’ ends … through the automated medium of an increasingly ubiquitous computational architecture of “smart” networked devices, things, and spaces” (Zuboff 2019, 8). Social physics is seen as a means to ‘correct’ behaviour by “developing the social systems that would work along the same lines as the machine systems, using behavioral data flows to judge the ‘correctness’ of

action patterns and to intervene when it is necessary to change ‘bad’ action to ‘correct’ action” (Zuboff 2019, 426). This imposition is similar to how social workers felt under CPIN, with there being ‘correct’ behaviour that felt to them as if it had nothing to do with child safety or family support. However, Munro suggests that “front line workers’ resistance to using tools as the designer intended may have some rational justification, and it is worth studying it in more detail.” (2005, 387). The research examples show the influence of case management systems and predictive tools on what constitutes correct behaviour.

According to Heidegger, anyone using technology as a means to an end will become entrapped in it (Heidegger 1977). There is something mysterious about technology that keeps it from being a neutral element of modernization (Margetts 1999). Heidegger has a very specific interpretation of technology. Technology orders nature into a standing reserve (Heidegger 1977). Dasein under technology “has already been claimed by a way of revealing that challenges him to approach nature as an object of research, until even the object disappears into the objectness of standing-reserve” (Heidegger 1977, 19). For Heidegger, the essence of technology is enframing (the mode of ordering the real into standing reserve), and technology enframes Dasein. The standing reserve in child protection is administrative data, and rationalization is a privileging of this explicit memory. Heidegger offers a solution to technology: equipment and world. Attending to implicit memory phenomena could lead to the creation of equipment that is viable across worlds and that satisfies purposes beyond ordering reality into standing reserve. There is more to the world than knowledge and reality, but this is all that is available for information technology and predictive analytics through explicit memory.

There are also moral considerations related to these unintended consequences. If we take the moral to be purpose and norms, then it can be undermined by the conditions created by technological change with a subsequent impact on moral agency. Zacka finds that “while public service agencies actively depend on the moral agency of street-level

bureaucrats, they place these bureaucrats in working conditions that tend to undermine that very agency" (2017, 241). Street-level bureaucrats perform their tasks in an environment “that forces them to contend not only with drastic limitation in resources and chronic shortage of staff, but also with incompatible objectives, unrealistic targets, arcane rules, and an endless stream of emotionally trying encounters with clients" (Zacka 2017, 11). When these conditions become embedded in technology, then it can enframe a ‘correct’ way of doing the work that reduces street-level bureaucrats and clients into the standing reserve of a simplified and legible administrative apparatus that needs to satisfy oversight and accountability objectives. This can undermine the moral agency upon which outcomes depend.

Three theories emerge: organizational memory transplantation, forced forgetting, and equipment dysphoria. Organizational memory transplantation means that the memory from one world may infiltrate another world through a tool. That tool might become equipment, in which case the norms and purposes in the world into which it is introduced might be changed, but it might meet with so much resistance that the tool never becomes equipment and needs to be abandoned. In fertile ground it may flourish, but if the soil is not fertile, decay may set in. Forced forgetting implies starving out unacknowledged or unwanted memory. This might occur where one world has the power to impose the mandatory use of a tool on another world. In order to use that tool as equipment, beings in that world might forget elements of their identity or explicit pieces of memory that do not fit into the tool. The tool starves them of light and nutrients by spreading mulch. Finally, equipment dysphoria can occur when a new technological tool is externally imposed and it recedes into the background and becomes equipment, but leaves workers with an ongoing sense of disquiet and anxiety that they cannot fully describe and may not even realize is related to the tool and the meaning it embeds.

The argument in this thesis has been that a narrow understanding of memory focused on explicit instantiations was insufficient to make sense of digital change in government and to solve the two puzzles noted above. The understanding of organizational memory needed to broaden in order to have a hope of addressing major foundational issues with rationalization and technological change that have hitherto remained unaddressed. The hope is that this typology of organizational memory can help to better make sense of the unintended consequences of information systems change in public administration.

10.5. Areas for future research

The research approach and framework suggest three main areas for future research. First, there are opportunities to carry out further research in areas that were envisioned but not possible during the course of this research study. Second, there are existing research areas that could be enriched by this extended perspective on organizational memory. Third, studies could be formulated that could test the relevance of this extended framework of organizational memory.

Immediate areas for future research exist where this project faced limitations in data collection from external sources (COVID-19, and change in government), or scope. These include field observation of artificial intelligence (specifically predictive analytics) in English children's social care, similar studies in other jurisdictions or sectors, and observational work in back-office central government public administration settings. Looking at organizational memory in the child protection context also promises to be relevant for parallel debates in other similar distributed public administration service settings, such as education (Mumtaz 2000; Dormann, Hinz, and Wittmann 2017), policing (J. N. Danziger and Kraemer 1985; Oswald et al. 2018; Lorenz, Meijer, and Schuppan 2021; Brayne 2014; R. Scott et al. 2019), health and public health (Zinszer et al. 2013; Schiff and Zucker 2016; Friedman et al. 2014; Cairney and Oliver 2017; Starr 1997; Smith 1993), and general administration (Lawrence, Hardy, and Phillips 2002; Longo et al. 2017).

In addition, a new information system can create a sense of disquiet and anxiety among workers that no one can even name. It is a type of trauma that disappears and conceals itself behind a veil of normality: what is proper, correct, or right. However, it has an indelible influence on people's sense of identity that persists beneath the surface. Another future area of research could ask about the theoretical constructs of organizational memory transplantation, forced forgetting, and equipment dysphoria. Questions could include the following: What does it look like for a tool that causes anxiety to eventually become equipment? What does this mean for memory? What does this mean for identity?

There are existing research areas that could potentially benefit from this extended organizational memory lens. These area include theories of the hollowing of the state (Rhodes 1994), technology as enframing the world into standing reserve (Heidegger 1977), social worlds (Strauss 1978), and research approaches that are limited by methodological individualism (K. Danziger 2008). It could look at the hollowing of the state and whether it extends beyond outsourcing to memory transplantation by private sector management ideology and forgetting of traditional professional public service values. It could challenge whether technology necessarily converts the world into standing reserve or if it depends on the purpose and worldview of those involved in its development and use. It could also extend the theory of social worlds by providing a more nuanced foundation for the study of intersectionality, allowing for the identities of different groups from different and overlapping worlds to be better understood and heard. Finally, it could help to move beyond methodological individualism in memory studies. For example, one can question the collective origins of performance metrics, their legitimacy in different worlds, and the consequences of their embodiment in tools that may integrate into activity as equipment. There may be the exercise of bureaucratic power over work conditions leading to forced forgetting and error. If the things workers are forgetting are implicit and we do not develop a

way to effectively reveal and interpret those phenomena, then, as Dreyfus et al. say, “no one will notice that something is missing" (Dreyfus, Dreyfus, and Athanasiou 1986, 206).

Finally, it is possible to build studies that test the relevance of implicit memory. The following table illustrates the kinds of questions that each type of memory is amenable to answering.

Table 9: Memory kinds and salient questions

Memory Kind	Salient Questions
Explicit Memory (Static or Dynamic)	What is measured? What is dynamically processed?
Tacit Memory	What frameworks underlie what we explicitly know?
Implicit Memory (Equipment or Being)	What is done? What identities guide actions?

Testing this heuristic typology for organizational memory could show that it is wrong, or that it could be improved upon. It is possible that it is just another stopover on the hermeneutic circle towards more sophisticated understanding. Regardless, it can be tested in relation to the memory implications of a technological tool as an object or as equipment; self-interpretations within worlds that order activity; and issues around boundary objects when different worlds come into contact. In so doing, the typology and novel forms of memory can enrich our understandings of the unintended consequences of information system change on organizational memory.

10.6. Concluding statement

The forms of memory proposed in this thesis offer a means to better describe puzzles around concurrent remembering and forgetting and provide a novel avenue to study the unintended consequences of information system change in public sector organizations.

In the specific cases of information system change in the child protection systems in Ontario and England there appeared to be a privileging of administrative ordering. In fundamental ontology terms, examples suggest a shift in whose world is privileged. We saw one world exercising power over another by prescribing their tools. There was memory transplantation from the administrative layer to the child protection layer that led to disruption and some resistance, but also potential instances of forced forgetting and equipment dysphoria as tools became equipment. Research examples showed the influence of case management systems and predictive tools on what constituted correct behaviour. There was a focus on accountability, New Public Management, and technological assistance, but inattention to other worlds, and the memory therein, had unintended consequences. With the five forms of memory proposed here, it is possible to better understand the implications for remembering and forgetting during periods of technological change.

Chapter 11: Conclusion

In this concluding section, a concise summary of findings is provided, followed by a presentation of key theoretical, methodological, practical, and ontological insights stemming from them, the implications and benefits of this expanded understanding of organizational memory, and the contribution of these findings to the understanding of technological change and organizational memory in public sector organizations.

11.1. Summary of findings

The proposed extended typology of organizational memory helps resolve memory puzzles in public administration and improves our ability to understand the unintended consequences of information system change. In terms of the puzzles, digital technology does not provide a ‘perfect memory’ because memory is not confined to what is stored explicitly. The idea of a ‘perfect’ digital memory makes certain reductionist assumptions about memory: that memory is explicit, that there are not implicit forms of memory operating in the background, and that memory is reproduction (a replica of the past), not reconstruction (where memory might be constantly shifting in response to new and changing experience). In the case of CPIN, this repository perspective failed to account for different worlds and purposes and in so doing allowed a new technology to displace the world and purposes of social work for the administrative world and purposes of the ministry.

The idea of implicit memory about purpose in a world also helps to resolve the puzzle about how you can have amnesia and inertia, or forgetting and remembering, at the same time. The solution is in the interplay of forms of memory. The explicit history behind an

approach (why something is done) can be lost, while the purposes and identities individuals are socialized into ensure the activity persists. Similarly, practices may change in response to a shift in background purpose, while established data elements (like those in risk assessments) may continue to be collected, processed, and used. We saw how in the back-and-forth between safety and family integrity, while the history was not always obvious, traces of each approach remained present in the tools and practices. We also saw how the being of social work appeared to be changing towards compliance while aspects of data collection underlying compliance remained the same (for example, focusing on administrative over client or clinical objectives). These phenomena can be better understood when different forms of memory are seen to coexist in practice.

In terms of the unintended consequences of technological change, the examples of implicit memory and the forms of memory suggested by them, highlight how the background memory from one world could become unintentionally and invisibly embedded in a technology that is mandated to be used in other worlds and how this can cause a period of disruption that is either unresolvable, or that fundamentally shifts the self-interpretations that are possible in those worlds. These changes and misunderstandings could undermine the functionality of the technology across worlds and its ability to achieve desired objectives, while also altering practice in ways that might not have been expected and that could go unnoticed. Overall, this extended typology of organizational memory helps with better understanding both remembering and forgetting in organizational settings and has hopefully also opened up many novel avenues to research the phenomena and paradoxes of organizational memory with greater clarity and sophistication..

11.2. Theoretical and methodological contributions

From a theoretical perspective, the findings emphasize the importance of looking at phenomena outside of an exclusively cognitivist perspective towards forms of memory grounded in fundamental ontology. We see the long tail of the history of the Cartesian

worldview and its permeation of discussions of AI, data science, and big data through ideas in cognitive science and information processing. Tsoukas argues that, "modernity has come to mistrust intuition, preferring explicitly articulated assertions; it is uncomfortable with ad hoc practices, opting for systematic procedures; it substitutes detached objectivity for personal commitment" (2005, 108). The thesis is not intended to suggest that background implicit memory is better than explicit or tacit, only to suggest that any debate that excludes it is potentially incomplete.

There are also epistemological and ontological implications. If knowledge is a technology that enframes the world and what we know depends on the world that we live in, then more attention ought to be paid to the ontologically more fundamental implicit memory to ensure that we better understand explicit memory practices and the conditions that make them possible. This can help us to make sense of why realities differ between worlds. An ontological understanding can also help us to make sense of the technologically driven metaphors we adopt, as they tend to represent our best efforts at the comforting stability and predictability of order and knowledge at a given time.

The impact of this perspective on memory could also open up novel avenues for social theory (T. M. Vogl 2020c; Aten, Howard-Grenville, and Ventresca 2012; Lounsbury and Ventresca 2003; Strauss 1978). Through the idea of fundamental ontology, where questions centre on being, opportunities arise to not only focus on the social and material, but on what is operating in the background that makes an understanding of those things possible in the first instance. This offers a means to extend techno-centric, human centric, social and material interaction, sociomaterial, and social and material imbrication theories. Putting these ideas in terms of memory (and memory as reconstructive in addition to reproductive) offers a means to look at sociomaterial practice over time (T. M. Vogl 2020c).

Methodological contributions include highlighting how the hermeneutic circle can be used as a form of analysis in the context of abductive research. Further, this study builds

upon short-term focused observational research methods by illustrating the value of a technological anchor to narrow the focus and ensure depth within that area. This study also builds on go-along and walkthrough methods (and their predecessors) to show how an adaptation of these approaches can be adopted and applied in a worker-facing public sector setting.

11.3. Practical and policy contributions

Ostensibly, my project is about memory in organizations and how the introduction of information technologies transforms how organizations remember. However, the real insight is related to how information technologies (new tools) can influence identity and the associated activity within organizations. Identity is that central, distinctive, and continuous phenomenon which guides what people do and how others should relate to that ordered activity. The typology helps call attention to how identity can be transformed by digital technologies that are intended to enhance explicit memory (like data or case narratives) and how the underlying memory that enables identity (like tool use and purpose within a given social world) can be unintentionally impacted. In the child protection sector, there were two overarching and at times competing identities at play. There was the identity of social work, focused on professional practice and service delivery to clients, and there was the identify of public administration, focused on compliance with regulatory standards. These identities were impacted by the introduction of new digital technologies, and this had practical and policy related implications for those working in this space in relation to accountability, technology adoption, and learning.

In terms of accountability, the technology was seen to shift focus from clinical and client outcomes towards a greater focus on compliance with administrative standards and the scoring of clients in terms of risk. It became easier to remember whether activities had been completed on time or the level of risk of a client, than how services were progressing or how clients were doing. This suggests that clients should advocate for memory technologies

that can centre their outcomes, that social workers should advocate for technologies that centre their professional practice, and that those developing the technology should support this multi-level understanding of accountability for clients, professionals, and administrators.

In relation to technology diffusion and adoption, technology implementations that failed to account for their use in practice led to them being pushed so far that they had unintended consequences, particularly around not fully meeting the memory needs of any of their users. Where information systems were designed to achieve administrative objectives of compliance or standardization without attending to the service-level needs of social workers, then the systems could hamper work and fail to deliver the anticipated outcomes. This calls for attention to the needs of users and specifically for greater adoption of user-centred design, where diverse user expectations are considered (not just of those closest to the administration of system implementation). This could help to identify how we can make information technology into a piece of equipment without unintended consequences. Not all user-centered design is created equal, and developers may also need to adopt more user experience testing through observation of information system use in practice to better understand the potential consequences of a new technology on different forms of organizational memory. This can be accomplished by creating opportunities to observe the tool used in practice and adapting its design accordingly to better align with the diverse needs of the competing worlds of its users.

Finally, in terms of learning, technologies that privilege certain forms and types of organizational memory over others risk limiting the range of information and experience that can be processed into new organizational behaviours and activities. When information systems prioritize compliance, standards, and scores, then information and experience related to client outcomes may be overlooked and intentions and efforts to learn about how to improve services for the benefit of clients may not materialize. Learning may then be focused on how to use a new technology and its gradual normalization. When the public

sector is trying to learn from experience to improve its services, for example by facilitating oversight or better predicting risk, it needs to ensure that the right memory inputs are prioritized not only to achieve those objectives, but to enable analysis of whether this is the desired kind of learning.

Together, the implications from the introduction of a new technology began to shift what people did, for example social workers began spending more time at the office completing their case documentation than providing direct services to clients. This shift became normalized for newer workers and could be said to have changed what it means for them to be a social worker. This suggests that thinking about organizational memory not only in terms of what is written, discussed, or conceptualized, but in terms of what is done and why, should form part of the preliminary analysis of any information technology project in the public sector. Without such analysis (the type of analysis facilitated by this extended typology of organizational memory), some unintended identity changes may occur unobserved that lead to unwanted policy, practice, and client outcomes.

In terms of the trend towards the use of more data science and artificial intelligence in government, the typology suggests a more cautionary approach to the application of these tools and techniques. Some relevant elements of organizational memory may not be embedded in the static data that they process, but may influence the usefulness of their results. That being said, these tools and techniques may be able to identify patterns, generate novel findings, or perform tasks that enhance different forms of organizational memory and organizational operations. Making these determinations will require attention to the forms of memory at play in a given context.

11.4. Concluding statement

This thesis set out to understand the unintended consequences of information system change on organizational memory, but ended up finding that current conceptions of organizational memory were inadequate to achieve this objective. This thesis looked at

evidence of how people and activities using digital technology complicated existing theories of organizational memory and led to an extension of the theory in order to make sense of some of these complications. A new typology of organizational memory was developed to better understand and make sense of those unintended consequences.

In the case of child protection, this research and conceptualization illustrates how decades of administrative datafication of practice and efforts to more dynamically manipulate that data using predictive analytics tools represent not merely efforts to make services more efficient and effective, but serve as mechanisms by which to change the frameworks people use to think about things, the affordances and disaffordances of equipment in the workplace, and what it means to be a social worker, all stemming from changes to different forms of memory.

Memory in organizations is a place of contestation. This thesis suggests that the contestation is not only over what is explicitly preserved in data, documents, or inter-agential communication, nor even over the conceptual frameworks operating behind how organizational actors think, but also to more implicit forms of memory that influence what people do, and who they are. In the case of child protection, evidence suggests that an information system is not simply a neutral tool that stores information, but that it shapes the activities that are done and can in turn have an impact on how organizational actors interpret their occupational or professional being. These influences can lead to resistance, unease, workarounds, and, as a result, unintended consequences that undermine the objectives of the information technology change. This suggests that attention should be focused on the different forms of memory, their situated instantiations and their interpretations in different parts of a public service sector. It also highlights the need for user-centred design and user experience testing that involves observation of technology use in practice. It also suggests that more attention is needed to whether memory, objectives, practices, and digital tools align.

Many of the phenomena explored in this research have some relation to how things are remembered in documents, people, their tools, and the organizations they collectively help to compose. By now, it should be clear that organizational memory is what people can tell, is more than what people can tell, and also has nothing to do with telling, but instead with the tools that people use and the worlds in which they dwell. In this way, I hope that this reconceptualization of organizational memory can shed more light on perceived memory-related pathologies associated with technological change in child protection and government more broadly, despite at the same time muddling our ability to ‘know’ some of the forms of memory. I also hope that by resolving the puzzles this typology of organizational memory can open up new avenues to study the unintended consequences of technological change in organizations.

Appendix 1: Interview and Observation Protocol

First Iteration

First stage (interview)

An opportunity to build rapport by asking questions of a descriptive nature about the formal constituents of organizational memory, including the rules, roles, and records that influence the participant's work, and features of administrative reform, including the New Public Management, Digital Era Government, and the Neo-Weberian State.

Rapport building

- When did you join? / How long have you been doing this type of work?
- Where did you work before?
- What led you here? / Why did you join?
- What was it like when you joined?
- Have you always been interested in <your current role or this field>?
- What in your opinion is the purpose of the child welfare system?

On organizational memory

- What are the rules that structure your work (e.g., legislation, standard operating procedures, office routines)?
- What are the characteristics of your role in the organization, both formal and informal?
- What records do you work with?
- What are the tools or technologies you use to carry out your work?
- Have any rules, aspects of your role, or records been built into these tools or technologies (e.g., rules built into the code of a program you use, parts of your role that have been technologically automated, or records that are digitized within information systems)?

On administrative reform

(New Public Management)

- Could you tell me a little bit about whether or how your sector has been disaggregated from other complementary service sectors?
- Could you tell me a little bit about whether or how changes in funding or performance management have increased competition between service providers in your sector?
- Could you tell me a little bit about whether or how certain ways of doing business have been incentivized by specific performance measures?

(Digital Era Governance)

- Could you tell me a little about whether or how data that you work with has been integrated with data from other providers or sectors?

- Could you tell me in what ways your organization is pursuing a more holistic approach to service, where the objective is to serve the needs of the whole person rather than needs related to a single sector?
- What aspects of your job have been changed by new technology?
- Could you tell me what services or routines have been digitised that weren't previously?

(Neo-Weberian State)

- Could you tell me a little about how much involvement the ministry has in the management of the system?
- Could you tell me in what ways the ministry has shifted the focus from following procedures to measuring outcomes and the quality of services?
- Could you tell me how you would characterize the professional culture in your organization?

Second stage (observation)

An opportunity to observe the participant using the tools they rely on to carry out their work. Most questions at this stage are expected to be probes.

- Could you show me the tools and technologies that you use to carry out your work?
- Could you show me how rules, roles, and records are built in to these technologies?
- I noticed you did <this activity (e.g., attaching a post-it note to a paper record)>, how does this help you to remember something relevant to your work?
- I noticed you did not do <this activity (e.g., filling out a specific field in a form)>, why is <this activity> not needed in this case?

Third stage (interview)

An opportunity to ask about practices observed in the second stage of the protocol and how they relate to organizational memory.

- How do you feel digital technologies have changed your work practice?
- Can you think of any examples of how technology has changed your ability to store information relevant to your work practice?
- Are you able to retrieve all of the information you need in order to do your job?
    - If not, is it because the information is difficult to retrieve, or because it is not there?
    - Can you give some examples?
- Do you think that there are things that are not being remembered as a result of the introduction of these digital technologies?
    - What kinds of things are not being remembered?
- How have these new technologies changed the way information is communicated between parts of your organization or the system?
- Has the organization considered changing any of its behaviours based on information processing made possible by this new technology?
    - If so, could you provide some examples?

- What do you or your colleagues find frustrating about these digital technologies?
    - Could you provide some specific examples?
- I've noticed that some people in your field do <this activity (e.g., not using a digital tool that limits professional discretion>, what in your opinion is the reason for this?
- If you were going to make a change to this system, what would you do?

Second Iteration

First stage (interview)

Background information

- Could you tell me a bit about your educational and professional background?
- What are the most important aspects of your current role?

On organizational memory

- How has the new case management system changed the types of roles that are needed in the sector?
- How have the work practices or activities of sector staff changed since the implementation of the new case management system?
- How have policies and procedures changed since the new case management system was implemented?
- How has the new case management system changed record keeping in the sector?
- How has the new case management system changed the way that information is collected, stored, and retrieved?
- How has the sector integrated information from the new case management system, legacy systems, and other tools?
- Is it easy for sector staff members to find the information they need?

On administrative reform

- From your perspective, what is the driving force behind the new case management system?
- Could you tell me a bit about the new case management system's influence on the IT environment in the sector?
- What kind of influence has the new case management system had on the professional ethos in the sector? (Both social workers and public administrators.)
- Could you tell me about whether there has been any splitting up of functional areas or services in the sector since the new case management system was implemented?
- Could you tell me about whether services that were previously fragmented in the sector have been reintegrated since the new case management system was implemented?
- Could you tell me about competition in the sector since the new case management system was implemented?
- Could you tell me about whether incentives have changed in the sector since the new case management system was implemented?
- Could you tell me about whether the sector is pursuing a more holistic approach to service, where the objective is to serve the whole person or family, since the new case management system was implemented?
- Could you tell me about whether the organizations that you have worked with have shifted focus from measuring outputs to measuring outcomes since the implementation of the new case management system?

Second stage (observation)

- Could you show me the tools and technologies that you use to carry out your work?
- I'd like to know how you use them to do your job. Could you show me your workflow in this environment?
- I noticed you did <this activity (e.g., attaching a post-it note to a paper record)>, how does this help you to remember something relevant to your work?
- I noticed you did not do <this activity (e.g., filling out a specific field in a form)>, why is <this activity> not needed in this case?

Third stage (interview)

- Do you think that there are things that are not being remembered as a result of the introduction of the new case management system?
- What kinds of things are not being remembered?
- How has the new case management system changed the way that organizations, branches, or staff communicate?
- How has the new case management system changed the way that organizations or staff behave?
- What do you or your colleagues find frustrating about the new case management system?
- Could you provide some specific examples?
- If you were going to make a change to this system, what would you do?

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