

Digital Preservation at Oxford and Cambridge

A collaborative research project to evaluate and provide sustainable recommendations for our digital preservation programmes

A digital preservation pattern language

Posted on **11 November, 2016** by **Dave Gerrard**

Technical Fellow, Dave, shares his final update from PASIG NYC in October. It includes his opinions on digital preservation terminology and his development of an interpretation model for mapping processes.

Another of the sessions at the [PASIG NYC](#) conference we attended concerned standardisation. It started with [Avoiding the 927 Problem: Standards, Digital Preservation, and Communities of Practice](#) by [Artefactual Systems'](#) Dan Gillean, which explained the relationships between De Jure / De Facto, and Open / Proprietary standards, and which introduced the major Digital Preservation standards. Then later in the session, Sibyl Schaefer ([@archivelle](#)) from the [UCSD Chronopolis Network](#) presented [Here we go again down this road: Certification and Recertification](#), which covered the ISO standardisation terminology (e.g. Certification vs Accreditation) and went deeper into the formal (De Jure) standards, in particular the Open Archival Information System (OAIS) reference model ([ISO 14721](#)) and the Audit and Certification of Trustworthy Digital Repositories ([ISO 16363](#)).

One aspect of Dan Gillean's presentation that resonated with me was his discussion of the Communities of Practice that had emerged around the Digital Preservation standards. This reminded

me of a software development concept called *design patterns*, which has its roots in (real) architecture, and in particular a book called *A Pattern Language: towns, buildings, construction*, by Christopher Alexander (et al). This proposes that planners and architects develop a 'language' of architecture so that they can learn from each other and contribute their ideas to a more harmonious, better-planned whole of well-designed cities, towns and countryside. The key concept they propose is that of the 'pattern':

The elements of this [architectural] language are entities called patterns. Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice (Alexander et al, 1977:x).

Each pattern has a common structure, including details of the problem it solves, the forces at work, the start and end states of related resources, and relationships to other patterns. (James Coplein has provided a short overview of [a typical pattern structure](#)). The idea is to build up a playbook of (de facto) standard approaches to common problems, and the types of behaviour that might solve them, as a way of sharing and reusing knowledge.

I asked around at PASIG to see if anyone had created a reusable set of Digital Preservation Patterns (somebody *please* tell me if so, it'll save me heaps of work!), but I drew a blank. So I grabbed the Alexander book (I work in a building containing 18 million books!), and also had a quick look online. The best online resource I found was <http://www.hillside.net/> – which contained lots of familiar names related to programming design patterns (e.g. [Erich Gamma](#), [Grady Booch](#), [Martin Fowler](#), [Ward Cunningham](#)). But the original Alexander book also gave me an insight into patterns that I'd never heard of before, in particular the very straightforward way that its patterns related to each other from the general / high level (e.g. patterns about regional, city and town planning), via mid-level patterns (for neighbourhoods, streets and building design), to the extremely detailed (e.g. patterns for where to put beds, baths and kitchen equipment).

This helped me consider what I think are two issues with Digital Preservation: firstly, there's a lot of jargon (e.g. 'fixity', 'technical metadata' or 'file format migration' – none of which are terms fit for normal conversation). Secondly, many of the Digital Preservation models mismatch concepts at different levels of abstraction and

complexity: for example the OAIS places a discrete process labelled *Data Management* alongside another labelled *Ingest*, where *Ingest* is quite a specific, discrete step in the overall picture, but where there's also a strong case for saying that *the whole of Digital Preservation is 'data management', including Ingest itself*.

Such issues of defining and labelling concepts are common in most computer-technology-related domains, of course, and they're often harmful (contributing to the common story of failed IT projects and angry developers / customers etc). But the way in which *A Pattern Language* arranges its patterns at the same levels of abstraction and detail, and in doing so enables drilling-down through region / city / town / neighbourhood / street / building / room, provides an elegant example of how to avoid this trap.

Hence I've been working on a model of the Digital Preservation domain that has 'elevator pitch' and 'plain English' levels of detail before I get to the nitty-gritty of technical details. My intention is to group similarly-sized and equally-complex sets of Digital Preservation processes together in ways that help describe them in clear, jargon-free ways, hence forming a reusable set of patterns that help people work out how to implement Digital Preservation in their own organisational contexts. I will have an opportunity to share this model, and the patterns I derive from it, as it develops. Watch this space.

Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I. and Angel, S. (1977) *A Pattern Language: towns, buildings, construction*. 1st edn. New York: Oxford University Press.

Do you know of any work that's been done to create a Digital Preservation Pattern Language? Would you like to contribute your ideas towards Dave's idea of creating a playbook of Digital Preservation design patterns? Please let Dave know using the form below...

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