

# Balancing the Books

## The Economics of Digital Curation Training & Education

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**Abstract** - A great deal of work has been done to try and quantify the costs of digital curation and much of it has focused on assigning a cost value, either to various parts of the lifecycle of digital objects or to stages in the curation workflow. These models tend to assume that an organisational capability to curate is a given and have not tended to factor in the economic considerations associated with ensuring the relevant personnel have the skills and knowledge to do the work effectively. Training can also be understood as an investment and as such, organisations have to weigh the costs against the benefits to determine whether paying for training is worthwhile. From the perspective of standard economic theory, there may be disincentives to sponsoring training, which in turn may affect supply and demand issues and contribute to market failure in the training sector.

The skills and capabilities that personnel either develop or acquire via training are all part of the complex financial equation that institutions have to solve to ensure that their digital assets remain safe and accessible. This paper will look at some of the issues related to training through an economic lens to test whether new insights emerge. The ultimate purpose is to check whether these issues have relevance for other projects and initiatives, especially the newly commenced EC-funded 4C project that is looking to help a diversity of organisations understand the true nature of investment into all aspects of digital curation, primarily through the mechanism of costs, but also through related concepts such as sustainability, value and benefits.

**Keywords** – *digital curation, training, supply, demand, economics, costs, investment*

### I. INTRODUCTION

One way of concisely explaining the benefits of digital curation is to call it an investment. This usefully sets out a few different expectations. The first is that unlike something that you might simply buy - and which therefore has a price - digital curation requires some thought, planning and strategy; and therefore the cost largely depends on the type of investment that is made. The second is the fact that investments tend to take time to mature and deliver returns, and the long-term nature of digital curation similarly does not generally pay sizeable and quick

dividends to impatient investors. Thirdly, it frames the activity in economic terms, and for the purposes of this paper, which is to consider digital curation training from an economic perspective, it indicates the sort of semantics that will be referenced.

There has been an array of projects and initiatives focusing on the costs and economics of digital curation in recent years[1] and further work to synthesise all of the existing information and to make sure that it is fit-for-purpose and as useable as possible is underway in the form of the 4C project [2]. This is a coordination action newly funded by the EC that will build on previous initiatives and reach out to diverse stakeholder groups. This will also need to include trainers and educators and those within institutions who are responsible for ensuring that the capacity and capability to curate is present within the organisation or procurable from without by cost-effective training and knowledge transfer.

One of the influential initiatives that the 4C project builds upon is a US/UK initiative that reported in 2010 called the Blue Ribbon Task Force on Sustainable Digital Preservation and Access[3]. This was the first significant attempt to frame digital preservation within the language of economics and to test assumptions using economic theories and methods. References to preservation as a 'derived demand' and digital objects as 'depreciable durable assets' may not be of tangible and immediate use to all practitioners, but for those with strategic responsibility for long-term planning in relation to such objects, and who need to have a deep understanding of what exactly constitutes an investment and what may remain a liability, the language of economics is surely appropriate. It is in this spirit that an enquiry into the economics of training and education has been tackled in this paper, using the commonplace framework of supply and demand (albeit in reverse).

### II. INDIVIDUAL DEMAND

It is clear from recent studies, not least the DigCurV survey and its report on training needs [4], that the current general

situation is far from satisfactory in terms of an appropriate and relevant amount of training being supplied from one side to meet a steady and predictable flow of demand from trainees on the other. From a total of 454 responses, almost 19 out of every 20 individuals surveyed declared that their organisation either already had, or was going to have, responsibility for the long term care of digital assets.

Well over half of them (57.3%) said that their organisations did not intend to recruit new staff to deal with this issue. When asked about the likelihood of receiving training to learn how to do this job effectively, over a third (35.4%) of respondents said that training would be provided for staff who had no previous experience. Just under a third (31.4%) said that staff who already had some expertise would receive further training. The remaining proportion (35.1%) was either considering alternative approaches to training (learning by doing?) or had not yet decided how to tackle the issue (or perhaps didn't even think it was an issue). Given the not insignificant scale of the survey and the diversity of the types of organisations that feature, an extrapolation of these figures across the global workforce could be indicative of an imminent and prodigious requirement for training, even allowing for the third that were not at this stage interested in training issues.

Evidence from other sources corroborates this view of demand growing over the next few years. If not specifically in terms of requests for training then certainly in the overall importance that people anticipate that digital curation/preservation/archiving will assume within institutions. A recent survey asked UK university libraries what level of current priority e-journal archiving represented and what sort of priority it was likely to be in 3-5 years time. The results clearly pointed to an increased level of focus on the issue. See figure 1 below.

In the course of two series of roadshow-type events organised by the UK Digital Preservation Coalition and the National Archives (UK), a total of around 700 participants from a wide range of organisations expressed the following opinions in formal and informal feedback [5].

- There is a great demand for training from staff already engaged in library and archive settings, and in particular for accessible introductory material.
- Participants at these two 'road show' series have consistently prioritized practical experience over theoretical knowledge, in particular through case studies and worked examples.
- Participants at these two 'road show' series have frequently requested practical exercises within training, learning through doing rather than passively listening to information.
- Participants at these two 'road show' series have shown willingness, even urgency, to make pragmatic progress in the preservation of digital collections. They favour small parcels of practical advice that is 'good enough' over comprehensive theoretical overviews and inaccessible research questions.

Not only does this reinforce the message that there is demand for training but usefully starts to articulate exactly what (some) people feel they would benefit from and therefore how (some) training might most efficiently be designed to meet their needs in the most cost-effective manner. The emphasis in this particular context was certainly on accessible and practical material that could be put to use relatively easily in an operational environment.

Returning to the DigCurV survey, the elicited information also indicates preferred modes of training: 75.3% said their preference was for small group work training (which was by far the most favoured mode). The most preferred occurrence of this type of training was on a one-off basis lasting between 1-2 days. The next preferred mode was for one-off training events lasting 3-5 days. Extended courses involving 1-4 hours of study per week were considered less popular and 1-2 week bloc courses in a repeated semester-style programme were less popular still – unsurprisingly, given the fact that this survey was chiefly aimed at addressing work-based vocational-style training rather than more academic approaches to learning.

An MIT study [6] from 2006 gauging the most effective of seven training delivery methods also rated "Classroom training with instructor" as by far the most popular and chosen in 30% more cases than the next highest option.

This picture of training needs is clearly important but what is difficult to discern is: the appetite for organisations to act upon these opinions; to make budget available to address these requirements; and how well-aligned the perceived requirements

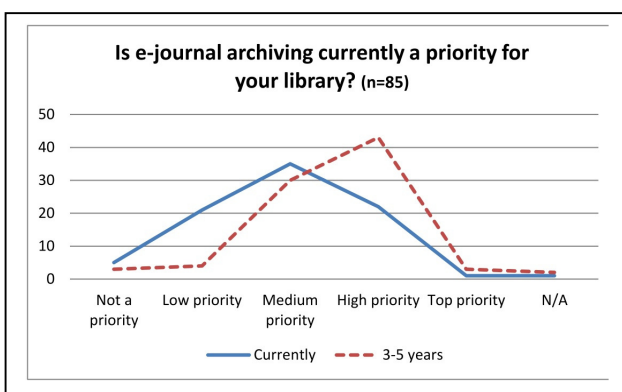


Figure 1 – Survey carried out for Jisc by Charles Beagrie Ltd. (2013)

of individuals are with the organisations they work for. To understand this requires very detailed knowledge about institutional concerns and some mapping of priorities between individuals and the organisations that they are employed by.

Organisations across different sectors are at very different levels of acceptance about the urgency and the importance of digital curation and this fact is understood and articulated by the five stage maturity model that emerged from the course developed at Cornell by Anne Kenney and Nancy McGovern[7].

- Acknowledge (Understanding that digital preservation is a local concern)
- Act (Initiating digital preservation projects)
- Consolidate (Segueing from projects to programs)
- Institutionalise (Incorporating the larger environment)
- Externalise (Embracing inter-institutional collaboration and dependencies)

It seems logical that those organisations that are less mature in their understanding of digital curation will be less open to the idea of training their staff to take on associated tasks. It's also tempting to characterise all staff within those organisations as sharing an overall view that trying to engage with the complexity of digital preservation will distract from core business. However, this begins to sound like an economist's theoretical conception of decision-making within the perfect marketplace, where all organisations act and think in a rational and coherent manner! An alternative depiction is the scenario where 'demand' often does not come either from the individual or from the organisation, but is the outcome of a conversation or a negotiation between the individual who would benefit from being trained, and another individual who has the authority and discretion to agree or to refuse to pay for that training.

### III. ORGANISATIONAL DEMAND

This concept assumes that 'the organisation' takes a view on the tactical and strategic benefit of sponsoring training for an employee, which can be articulated in economic terms as a *human capital investment* decision. (In practice of course this is likely to be an individual or a small group of individuals attempting to act in the interests of the organisation as a whole). Standard economic theory [8] on this topic suggests that organisations will not invest in general training for their employees and will under-invest in specific training. The definitions are as follows:

- General Training - training that will make the employee equally useful to many different organisations.

- Specific Training - training that makes the employee useful within the sponsoring organisation and has no effect on the productivity of that person in alternative employment.

As seems often the case with economic theory, some further time is spent setting out what a 'perfect' model or market might consist of, which – for interest – is where there is full and open competition between organisations in their search for human capital; where all training is general; where all organisations train; all workers are trained; and everyone is purely motivated by financial gain. The admission in the literature that this perfect scenario is not ultimately realistic is acknowledged but not altogether accepted as logical.

“... a large body of empirical evidence obtained in laboratory experiments shows that a substantial fraction of subjects behave as if they are motivated by factors other than their own monetary payoffs.”[9]

The organisation that is a potential sponsor of training has a duty to think very carefully about the full cost and all the implications of training any particular individual. Training providers obviously believe that training is an unqualified good, just as those in the business of providing education believe that education, both for its own sake and for the development of the individual as an economic contributor to society makes a positive difference. From a purely economic point of view it might work against the interests of the organisation because:

- a) The cost is higher than might be apparent to the trainee
- b) It sets up expectations of future activity that the organisation might not be able to afford
- c) It exposes the trainee to disruptive ideas that the organisation might not be able to accommodate or react to effectively
- d) It enables the trainee to find employment elsewhere

The formal cost of the training might be anything from \$0 to \$1500 (see the discussion of *Supply* below) for vocational study or much more for educational opportunities. The productivity cost and the opportunity cost of releasing a valued and productive worker to attend training needs to be factored into the overall equation. If there are multiple training options to monitor, evaluate and coordinate, along with numbers of staff to deal with equitably - some allowance for choosing and arranging training on behalf of employees will need to be costed. If there is prior reading required and/or follow up in the form of reporting, this will also affect productivity.

The impact and effect of points b) and c) above are obviously very hard to anticipate and manage and address the insecurities of all organisations, many of whom might like to regard themselves as forward-thinking; tolerant of innovation; and strategic in their

approach to staff development – but may, in reality, be as anxious as the next organisation about a) and d).

The impact of d) is of particular concern to economists and provokes a great deal of theorising, particularly in relation to general and specific forms of training. As noted above, if the employee asks (at the company's expense) to be trained in a marketable skill or to have commercial knowledge bestowed upon them, the employer will need to think very carefully whether it is in their interests to support that individual to acquire those commodities. The unimaginative employer may prefer to maintain the status quo; support the productive employee in the role they are in; and not encourage aspirations about changing their status or designing their future.

#### IV.RECIPROCITY

It is likely that the scenario outlined above exaggerates and simplifies, firstly for effect, but also because the language and methods of economic analysis tend towards the formulaic. It is clear also that its relevance might be more or less applicable depending on the nature of the organisation, the most basic categorisation being whether decisions are required of a public or a private enterprise. It is clear that the drivers acting upon staff are very different in large and small and profit and non-profit organisations.

Whatever the level of relevance, it is logically true that the desires of the individual and the needs of the organisation are rarely exactly aligned. To alleviate this misalignment and to bridge the gap between the individual and the organisational views of human capital investment, Leuven et al suggest that the principle of *reciprocity* comes into play, which is a concise term for the good will that has to exist between the two parties in order for general training to be paid for by the organisation [10].

As mentioned above, standard economic theory deems general training to not be in the interests of the sponsoring organisation, and it therefore requires good will (and some trust) for the organisation to approve expenditure. Good will on the part of the employee is demonstrated by them behaving less opportunistically than standard theory assumes they will (i.e. immediately exploiting their new found skills to apply for a better paid role elsewhere).

Even with specific training, where the assumption is that the training received and the skills acquired are not transferable beyond the sponsoring organisation, some element of good will is still required because the standard tendency on the part of organisations is to under-invest. The problem in this case is not the loss of human capital investment (caused by turnover of valuable staff) but the likelihood of wage inflation in line with productivity gains following instances of training.

Leuven et al quote results from a survey undertaken in 2001 that, amongst other things, tried to ascertain employees' sensitivity to reciprocity. Having established which of those people amongst a representative sample of the Dutch population aged 16-64 had undertaken training in the previous 12 months (and associated details such as whether this was on work time, who paid for it, etc.), the survey finally asked, "if someone does something that is beneficial to you, would you be prepared to return a favour, even when this was not agreed on in advance?" The survey (1,393 people) prompted the following responses:

1. Not at all (1.0%)
2. No (3.3%)
3. Maybe (9.1%)
4. Yes (60.8%)
5. Certainly yes (25.8%)

This combined with other features of the survey led them to the following conclusions:

- Older respondents are less inclined to return a favour in response to someone doing something that is beneficial to them
- Younger employees are more reciprocal and participate more in training
- Those with more advanced levels of educational attainment are more reciprocal
- There is no systematic relation between respondents' reciprocal attitudes whether they are female, migrant, single or have children
- Women are less likely to participate in organisation-sponsored training than men, but are more likely to participate in training that the organisation does not support
- Employees are more likely to participate in sponsored training when the employer possesses its own training centre and when the organisation is larger
- Organisations learn quickly about the level of an employee's reciprocity
- Respondents with a high reciprocity rating were 15% more likely to receive training in a 12-month period than those declaring low reciprocity.

At a reductive level, some of the conclusions are self-evident. Young people implicitly lack knowledge and experience and therefore are more likely candidates for training; convenience will encourage uptake, etc. Perhaps the important figure is the last point which states the level of increased likelihood of securing sponsored training through the demonstration of a reciprocal attitude in the work place. Once again, however, it is open to question how practically useful economic theory is when

confronted with the real complexities of relationships and negotiations.

## V. SUPPLY

The above account of demand tries to underpin some intuitively known barriers to sponsoring training with a dose of economic theory, to test (much like the Blue Ribbon Task Force did) whether such economic perspectives can offer new insights. Research and analysis relating to economic theories on the *supply* of training no doubt also exist, but were less immediately obvious. It is clear at a practical level though, both from the evidence emerging from the earlier cited DigCurV and APARSEN work, that the amount and type of training that is on offer is not perceived as sufficient to enable effective digital curation to occur in all the working contexts where it is required. The DigCurV study states: “Across the groups participants stated a lack of appropriate training offers.” It also states: “Some also noted that there are not enough skilled candidates on the labour market.”[11]

In the perfect competitive market (that has had time to establish itself), received wisdom dictates that if there is high demand then supply will automatically develop to meet that demand. Taking a purely economic view on this gap, one would have to conclude that training providers have not appeared because it is not financially viable to offer training on the topic of digital curation, which given the supposed level of demand is puzzling. The answer must be that the market is (as ever) imperfect and other factors are obscuring and blocking the expected machinations of the economy.

One possible explanation could be that developing training courses or materials for digital curation is disproportionately expensive or difficult. A Jisc-funded study from 2004[12] looked into this particular issue and asked a number of training providers how much it costs to develop and deliver a 5-day course.

Preparation	Type	Delivery	Total
34 days @£500 per day	Bespoke course	£10k	£27k
Minimal	Pulled together from existing sources	Internal to the organisation	£1.5k
Minimal - moderate	Some external speakers and some commissioned material	Internal to the organisation	£4.5k
20 days @ £500 per day + £5k for materials	??	£2.5k	£17.5k
£30k-£40k	Bespoke course	£4.5k	£34.5k - £44.5k

These cost estimates are nearly a decade old so may need updating, but even if they represent ball park figures, the high-end of £44.5k does not seem a formidable financial obstacle, considering that it should be possible, given the supposed demand, to run the course multiple times before more investment is required to update the course materials. The potential returns on such investment might be judged by the fees quoted for current courses:

- Digital Preservation Training Programme (DPTP) - £650 + VAT (£780) 3 day course  
MIT Libraries Digital Preservation Management Workshops – Intermediate for Management - \$1,500 (£978) – 5 day course

The second of these prices was found by consulting the Library of Congress list of digital preservation/curation training opportunities put together by Butch Lazorchak[13], which incidentally makes instructive reading about the range of courses and one-off sessions that are on offer, of different durations and at all prices, ranging from free to the \$1,500 quote above.

If capital investment is not the issue (and that is not to say that it isn't ... but only that it doesn't *feel* like the issue), then why aren't more suppliers of digital curation training not stepping forward with satisfactory products? The following statements might provide some starting points for discussion or some potential perspectives that may require more analysis and research:

- Digital Curation is too technically complex or niche a field and many providers are not yet in a position to assemble and deliver appropriate training
- The market for training is confusing and obscure for training providers and they don't understand who they would deliver products to
- There are no established products that address clear tasks that institutions require someone to tackle
- There is no obvious level of certified capability that confers credit on the trainer or the trainee

On the last question of certification, there are benefits and potential problems of attempting to make the capability of an organisation - and the identity of those with useful skills within it - more visible to the market. It is relatively straightforward for an organisation to attach wages to tasks but more difficult to attach wages to skills. This can be mitigated by the use of certification but the employer then runs an increased risk of having the employee poached by another organisation. This returns back to the problems of open and competitive markets referred to above and which has been a well rehearsed theme in the literature of labour market economics, going back at least as far as Arthur Cecil Pigou in 1912 and possibly further [14].



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