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April 2002

Digital resource cost efficiency and income generation compared with analog resources

A study on behalf of the Andrew W. Mellon Foundation

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Executive Summary

The study has been carried out by the Higher Education Digitisation Service (HEDS) based at the University of Hertfordshire on behalf of the Andrew W. Mellon Foundation. The aim of the study is that through interviews and comparative modelling of costs and fees charged, it will be possible to see the differences in practice for the sale of analog versus digital formats.

- 51 institutions were surveyed.
- 15 institutional service providers were interviewed in depth.
- 11 were in the UK, the remaining 4 were in mainland Europe.

An overview of results of the study:

- The price offered to the consumer for a digital item was on average 10.51% cheaper than the equivalent analog item from the 51 surveyed services. The interviewed institutions showed digital as 22.21% cheaper.
- 37.5% charged the same price for equivalent analog and digital items.
- In 82.5% of cases the digital product is either cheaper or the same price as the analog product for the consumer.
- 72.5% of cases had a website offering the service in some manner. 25.5% offered the consumer a thumbnail or other Web view of the item to aid selection. 9.8% offered e-commerce facilities.
- Almost all interviewed institutions fixed prices for the sale of the item based upon some assessment of their internal costs. But the most powerful deciding factor for price was the perceived market value of the item (as defined by what similar organizations are charging) rather than the actual cost of creation and provision.
- Digital is considered a cheaper product to create and distribute than analog, because of the low consumable costs in creating multiple copies.
- None of the interviewed institutions were fully recovering the cost of creation, management, storage and service provision solely from the sale of the digital item itself.
- Only those institutions that accounted for the revenue raised from the sale of commercial rights to use the materials as a part of their operation showed an actual surplus or profit.
- All organizations surveyed placed their duty to provide low cost access to materials to the public above the need to make a profit from those materials.
- The provision of services is driven by the public's desire to have access to the unique, rare and valuable collections available in European cultural and heritage institutions.
- No institution was able to quantify accurately the cost of digital preservation and thus consider mechanisms to sustain the service in the sale price of the digital item.

1. Introduction

This study has been carried out in order to investigate some of the underlying assumptions being made in the move from previously analog photographic services into the realm of digital capture and delivery, in particular to look at how marketable, cost efficient and income-stable the new digital services and resources are in comparison with previous methods (which in many places still exist alongside the newer digital developments). Cultural institutions which hold valuable and unique/rare artefacts have been creating surrogate representations of these for centuries. Since the development of photo-reproduction methods, these institutions have made available a whole range of secondary images for many purposes: for scholarship, teaching, public enjoyment, publication, etc. Most large libraries and galleries promote reproductions of their own images as mass consumer goods such as postcards or posters. Many institutions also offer on-demand services to create and supply very high quality photographs for scholarship and publication. With the development of top-of-the range digital cameras and scanners, digital reproductions which rival in quality even the best of photographic images can now be supplied. So many institutions are now turning to digital capture for some or all of their services. Throughout this report, we refer to photographic reproductions as 'analog', in comparison with the newer 'digital' formats. We deal only with cultural and heritage artefacts with significant image content, contemporary text based documentary formats (such as printed books and journals) are excluded from the focus of this study.

A number of recent studies (Tanner and Deegan (2002), Besser and Yamashita (1998), Chapman (1998); Snyder and Davenport (1997)) identify some of the economic benefits of the digital resource affirming the major role that costing plays in the decision making process to achieve benefits and to measure how benefits are conferred at an institutional level. One issue which has been to the fore as the study has been carried out is the relationship between medium and message: does the form of medium have a more significant effect on society and knowledge than the contents carried, as McLuhan has so famously suggested? Or is medium irrelevant, and merely a 'container' for the content being conveyed? It is the conjunction of the changing formats from analog to digital and the cost efficiency of this transition which is at the core of this report.

The study has been carried out by the Higher Education Digitisation Service (HEDS) based at the University of Hertfordshire on behalf of the Andrew W. Mellon Foundation. The aim is that through interviews and comparative modelling of costs and fees charged, it will be possible to see the differences in practice for analog versus digital formats. From this investigation the questions of why these should be different and what drives the pricing policy may be answered. The study focussed on libraries, museums, archives and similar public institutions that charge for the sale of print, photographic or digital formats. The primary objective was to study institutions in the UK, but some other European public institutions were also investigated. An outline of the original project proposal is given in Appendix A.

A central hypothesis the Mellon Foundation wished to test was that anxieties over reduced income in cultural institutions may actually be a perceived loss of the gatekeeping rights function, rather than actual loss of income for the medium, if measured against the pre-digital environment. This report aims to provide information which will aid the future decision making of funding agencies and project planning in deciding the relative merits of digital resources over analog in terms of their chargeable status and possible rights issues. In total 51 institutions were surveyed and 15 were interviewed in depth providing a reasonable evidence base for this report.

The methodology used in the study is identified in section 3. The institutions studied, the respondents to the survey and those interviewed are described in section 4.1. The detailed results of the study are detailed in section 4.2 and 4.3 with both statistical and interview responses analysed. There then follows HEDS conclusions in section 5 and recommendations in section 6.

2. Confidentiality of Participants

Before detailing the method and results gained from the study it is essential to emphasise that all the respondents to the interviews were offered a confidentiality agreement. This was necessary in many cases to enable HEDS to interview in the first place and was essential to gain financial and pricing policy information from the interviewees. The confidentiality agreement offered was:

> *We would like to thank you for agreeing to take part in our research. HEDS understands and respects the sensitivity and confidentiality of the information that might be provided by you. We value your participation and give the following assurances:*
>
> *The identity of your organisation and its association with the information you provide will be known only to the members of the research team and the appointed representative of the funding body (the Andrew W. Mellon Foundation).*
>
> *Neither you nor your organisation will be identified in any reports or publications. If the information you provide contributes to any publication, it will be presented in a manner which precludes any association with you or your organisation.*

HEDS have included detailed information about the interview responses within this report, but the institution is not identified other than by a code which relates to its sector of activity (e.g. U for University). Whilst this might be slightly ponderous, it is a necessary filter to protect the confidentiality of the institutions interviewed.

Note to the Mellon Foundation: the names of all the institutions surveyed and interviewed are available in Appendix G, with a key to the codes used in the main body of this report in Appendix F.

3. Methodology

The following section will detail the method used to agin the results of the survey.

3.1 Some original assumptions

There were a number of key factors that HEDS were specifically investigating in order to test some underlying assumptions and thus the methodology was designed to elicit this form of information. The hypothesis that the study began with was that costing and charging policies tend to be based upon:

- Information from the pre-digital environment that is not always appropriate or transferable.
- The highly visible cost factors only, rather than the complete institutional costs (which are at times obscured and underplayed in the charging structures).
- Perceptions of what would constitute appropriate revenue, rather than directly referenced to actual costs.
- Perceptions of the current acceptable market rate.

The method was built to provide a foundation of fact-based numeric data collection and analysis, within a framework of opinion-based research into the underlying reasoning driving charging and rights policies. The report thus supports or opposes these hypotheses from a solid evidence base.

3.2 Participants in the study

The study was led by Brian Robinson, HEDS Manager, with the assistance of the HEDS Senior Consultant, Simon Tanner, and with the additional participation of Marilyn Deegan (Oxford University). Donald Waters was the primary representative of the Mellon Foundation to the study.

3.3 Instruments used in the study

The study used the following set of instruments to facilitate the gathering of information for this report:

1. **Email survey** - a request for information about services provided. This was followed up by further web research or other communication to fulfil the basic query set for the survey. See **Appendix B** for a copy of the email request.
2. **Basic query set for the survey**. This set of indicative elements had to be completed for each of the survey respondents or services found either by email request or web research and then entered into an Excel spreadsheet for later analysis. See **Appendix C** for the basic query set for the survey.
3. **Structured interview**. This set of structured questions created a framework for the interviews. See **Appendix D** for the list of questions.

3.4 Activities

The following activities were carried out to complete the project:

a) Review of literature, articles, Websites and organizations in the area of the project study.

b) Publicity to raise general interest and awareness in the community.

c) Search for and make a request from the community for any cost models; pricing information; price lists for both analog and digital objects, plus any policy frameworks, rights management costs and market surveys. See Email Survey.

d) Select and contact ~ 2-3 institutions for initial contact and discussion as part of the scoping stage.

e) Decide basic parameters for what can be measured.

f) Decide basic elements to the cost model required to enable suitable comparisons.

g) Decide on questions to ask in structured interviews.

h) Create a confidentiality statement to guarantee anonymity.

i) Test the initial questions, model elements etc with the 2-3 scoping institutions.

j) Seek information about policy frameworks from the test institutions.

k) Collate the information gathered into numeric and soft data tables.

l) Results will validate the methodology and test whether the information gained produce comparable data.

m) Amend method accordingly.

n) Retest against another 1-2 of the willing scoping institutions to validate amended method.

o) Draw up list of 25 potential institutions for the full test.

p) Contact all 25 to find most relevant and willing participant(s) from the institution. Found only able to work with 15 in detail.

q) Send all willing participants a brief summary of the project intentions, the guarantee of confidentiality, an overview of the questions and a request for them to send us any documentation (prices list etc) that they have already in place before we visit to interview.

r) Visit the participant and interview – structuring initially around the first findings but ensuring that all the questions and elements required for the comparison are covered.

s) Assuming the participant can answer all questions fully then this will not need to be repeated, otherwise will have to contact participant again in follow up interviews (by phone and email, rarely by further visit) to garner the complete information or remind them to send existing documents. However, if the participant does not have the relevant information at all then this becomes a valid result of the study.

t) Iterate process until sufficient information has been gathered to enable significant comparison.

u) Follow up email survey with web research to discover other institutions offering services that may be used in the numeric analysis for the report.

v) Ensure that adequate information has been gathered to complete the relevant query set for the survey.

w) Final analysis of results gathered.

x) Filter numeric data gathered into a single format, thus enabling comparison.

y) Collate together the soft data and opinion based information into a cohesive report of approaches to the issues made by various institutions.

z) Make conclusions and recommendations from the study.

3.5 Notes on activities and method

There were some specific findings and assumptions implicit within the activities and method that should be noted.

The literature review revealed that there are very few relevant publications available for the UK. Those that were found are highlighted in **Appendix E**. Some studies have been carried out but are not available for commercial confidentiality purposes. For example, UK consultancy firm Acumen, did a report in September 2000 looking at Pricing Strategies for Digital Museums (http://www.acumenuk.co.uk/projects.htm) but this remains unavailable to a general audience.

The email survey produced 34 responses. These were used partially as the basis for selecting institutions for interview in conjunction with the HEDS research teams knowledge of institutions that might be useful to the study. 15 institutions were interviewed to gain in depth information. The email study was augmented by further research (particularly on the Internet) to find other services relevant to the study. 51 institutions in total were surveyed.

To gain a direct comparative price between analog and digital it was decided that, unless an exactly comparable resource was clearly offered in the pricing information, then the following factors would be used to find comparative data:

- Look for equivalencies in data size (pixel dimensions, dpi etc) in relation to the analog items offered (physical size, format).
- Do not select analog items of greater than A4 or 10" x 8" dimension.
- Do not select digital items resulting in file sizes of greater than 100 Mb.
- Always select the colour item if available and if not then ensure the same colour depth is selected for both items in the comparison.
- Select prices for items offered for non-commercial use.
- Within these constraints select the most expensive analog to compare to the most expensive digital item.
- Remove extraneous costs from the item, such as taxes, delivery charges or other ancillary costs to the main item cost.

During the interviews the institution representative was asked to provide estimates of the cost, revenue raised and profit elements involved in the creation, management and sale of digital items. They were also asked to provide information on the comparative costs of digital to analog. The study did not seek to find out the internal costs as a financial figure because it was deemed too sensitive to request such information from the interviewees. Therefore all the data gathered was requested in percentage terms, thus gaining a comparable set of data from disparate costing strategies whilst avoiding requesting confidential information. As the study actually progressed it became apparent that many of the institutions interviewed were not able to break down their costs and profit even into percentage terms. We therefore gathered lower levels of data in this area than expected.

4 Results

4.1 Results from the institutions studied

The following numbers and types of institutions were surveyed and interviewed:

- 51 institutions were surveyed in total – of these 9 were surveyed through the Internet only.
- 15 institutions were interviewed in detail.
- 4 of the interviewed institutions were not from the UK, but mainland Europe.

The breakdown of institutions is:

Type of Institution	Surveyed (excluding interviews)	Interviewed
University Library	16	3
Public Library	6	3
National Library	2	4
Museum and Gallery	7	5
Picture Library	1	0
County council or archive	4	0

These figures demonstrate a reasonable overview of the maturity of the market with the exception that HEDS deliberately excluded commercial picture libraries as being outside the main scope of the study. The provision of services by universities demonstrates both the importance and range of their collections but also their confidence in using the Internet as a means of publicising and delivering services. Universities are also more developed in delivering digital items in conjunction with their analog services. The public library figure is maybe slightly misleading as many public libraries offer some analog services, but usually not digital, and therefore were not focused upon in this study. Also the county council and archive figures could be added to the public library as they are funded from the same local government sources. The inclusion of many national libraries reflects the importance of these institutions to the national heritage and also the maturity of their services with comparable digital and analog services. Finally, the museums and galleries demonstrate maturity in this particular market that, generally, the other institutions sectors have yet to catch up with. Therefore museums and galleries are well represented in the survey.

4.1.1 Nature of the institutions interviewed

The University Libraries interviewed are from amongst the largest research libraries in the UK University sector. Their collections are of at least national importance and their library services are extensive to reflect the needs of their users.

The Public Libraries interviewed were all large and metropolitan, with one from outside the UK. They tend to reflect a large collection of local history material and are providing services to meet local information needs.

The National Libraries interviewed included 3 from outside the UK. They naturally have unique collections of at least national importance and as such these are under great demand. Their user based services are very well established and they tend to have large programmes of digitisation in place already.

The Museums and Galleries interviewed all had collections of national importance. Their collections ranged from just a few thousand items of great significance to the larger museums collections with millions of important items. Their services are mature and many tend to follow the picture library model of provision in response to the high demand for access to their unique resources.

4.1.2 Payment options available from the institutions surveyed

The results from the 51 institutions give some indication of the overall maturity of the market for the sale of analog and digital items in the heritage sector. It also shows the state of the technical provision and integration of the business process with wider institutional goals. Obviously many services offer multiple methods of payment.

Payment options explored

	Number of institutions	Percentage
Payment in advance	36	70.5%
Payment on delivery	8	15.7%
E-commerce	5	9.8%
Credit card	16	31.3%
Cheque/bank transfer	24	47%
Invoice	18	35.3%
Cash	15	29.4%
Other	2	3.9%

There are 20 institutions (39%) that do not state anywhere in their literature, on the Internet, via their price list or by any other means what payment methods are acceptable. This demonstrates an interesting lack of basic information to their user base. It is not possible to draw many conclusions from this negative result, apart from to state that public and national libraries are proportionately better at informing their users of the payment methods than the other sectors.

Those that accept e-commerce as a means of payment may again indicate a level of sophistication. Of the 5 institutions that accepted e-commerce: 2 were from national libraries, 1 was a museum, 1 a picture library and 1 a county council. The picture library is typical of that sector and does not provide new insight. The county council did not directly accept e-commerce payments as their resources were hosted on a kind of heritage picture library – this result can thus be discounted as insignificant. However, the lead demonstrated by national libraries and museums in providing e-commerce does appear to be an indicator of market sophistication and possible future trends.

As most of the services were provided within a much larger institutional context, the study also examined the institutions themselves. 6 host institutions had e-commerce services, usually an online shopping option, separate from the image/information service provider surveyed. More significantly, when the study checked the level of apparent integration of the service provider surveyed with their wider institutions business processes the results were surprisingly poor, with only 11% showing any level of apparent integration. Thus most of the services surveyed remain stand alone within the library and not integrated within the larger host institution's business goals.

Further measures of sophistication of the service level were also made in terms of how the consumer could select the items they wanted and also what the turnaround time offered to the consumer was.

- 74.5% of services required the consumer to select either from the library catalogue or from knowledge of the collection.
- 25.5% of services offered the consumer a thumbnail or other Web view of the item in the collection to enable selection of the item.
- 72.5% of services had a website offering the service in some manner.
- The average turnaround time from order to delivery offered to the consumer in was 13 working days. However, 47% of the services surveyed did not offer any guidance on the turnaround time at all.

A survey of whether the work was done inhouse by the service or outsourced showed:

- 12% of services outsourced the work. The remaining 88% did all the work inhouse.

4.2 Results of cost study from survey

Cost information was gathered from the survey. This was obtained by reducing the price offered to the non-commercial client to its core value by filtering out delivery charges, format costs and taxes for instance. The following results were found:

- The average price of an analog item = £18.57 (from 48 responses)
- The average price of a digital item = £17.09 (from 42 responses)
- The average price differential = -10.51% (from 40 direct comparisons possible digital is cheaper than analog)

Digital is 10.51% cheaper than the comparable analog item, based on the price offered the consumer. The ranging of the prices for digital and analog are shown in Figure 1.

It is worth noting that 15 of the 40 responses show a 0% difference in price. Therefore in 37.5% of comparable cases, the consumer was offered a choice of delivery medium without having to consider the economic ramifications of that choice.

Figure 2 shows that in terms of the range of price differentials the 15 responses at 0% is a dominating factor in defining the overall differential. There are 18 responses that show digital as cheaper to the consumer than analog, whereas there are only 7 responses where digital was more expensive. Therefore in 82.5% of cases digital is either the same price or cheaper for the consumer than the analog equivalent.

Figure 1: The price range of analog and digital

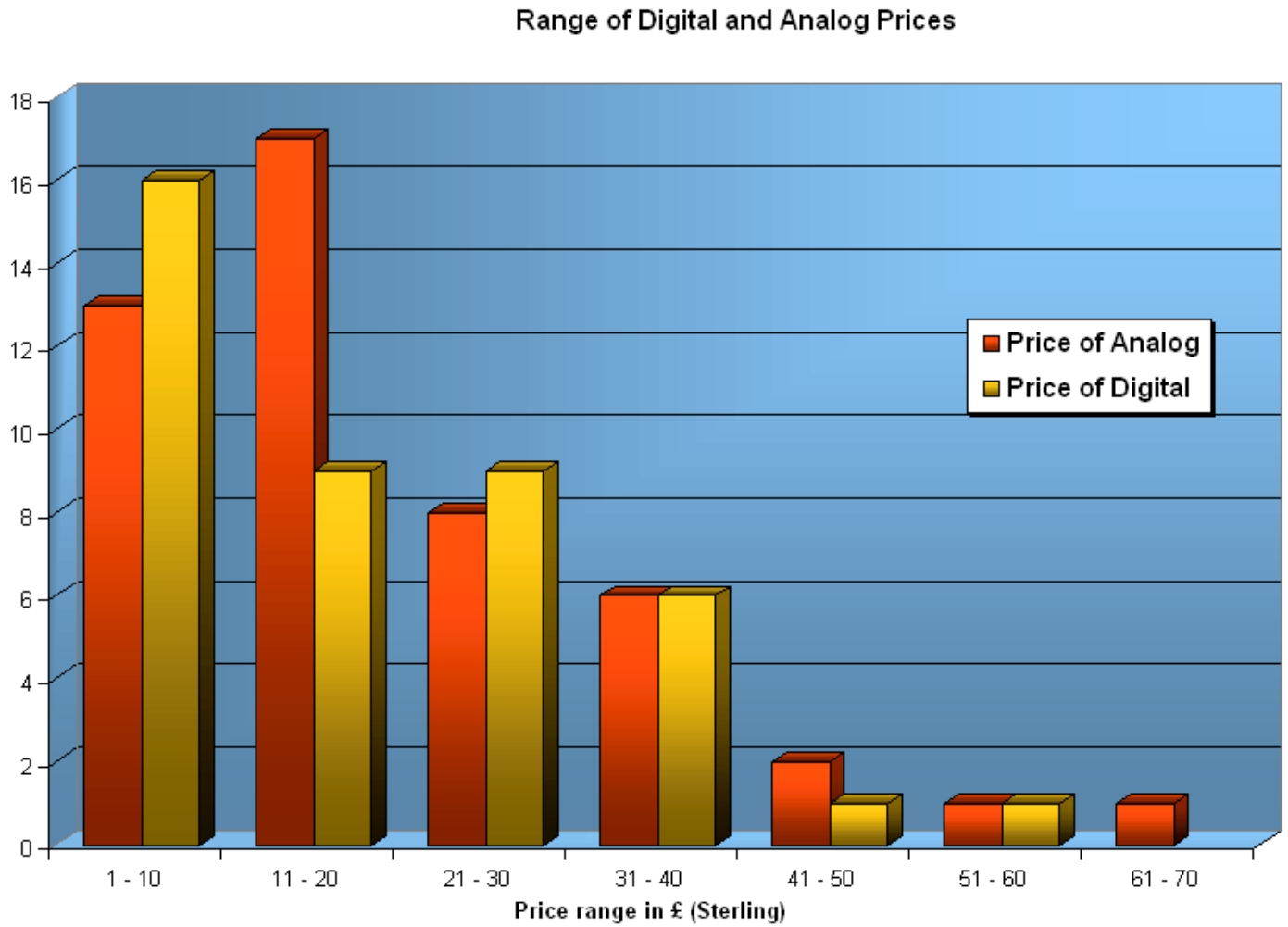
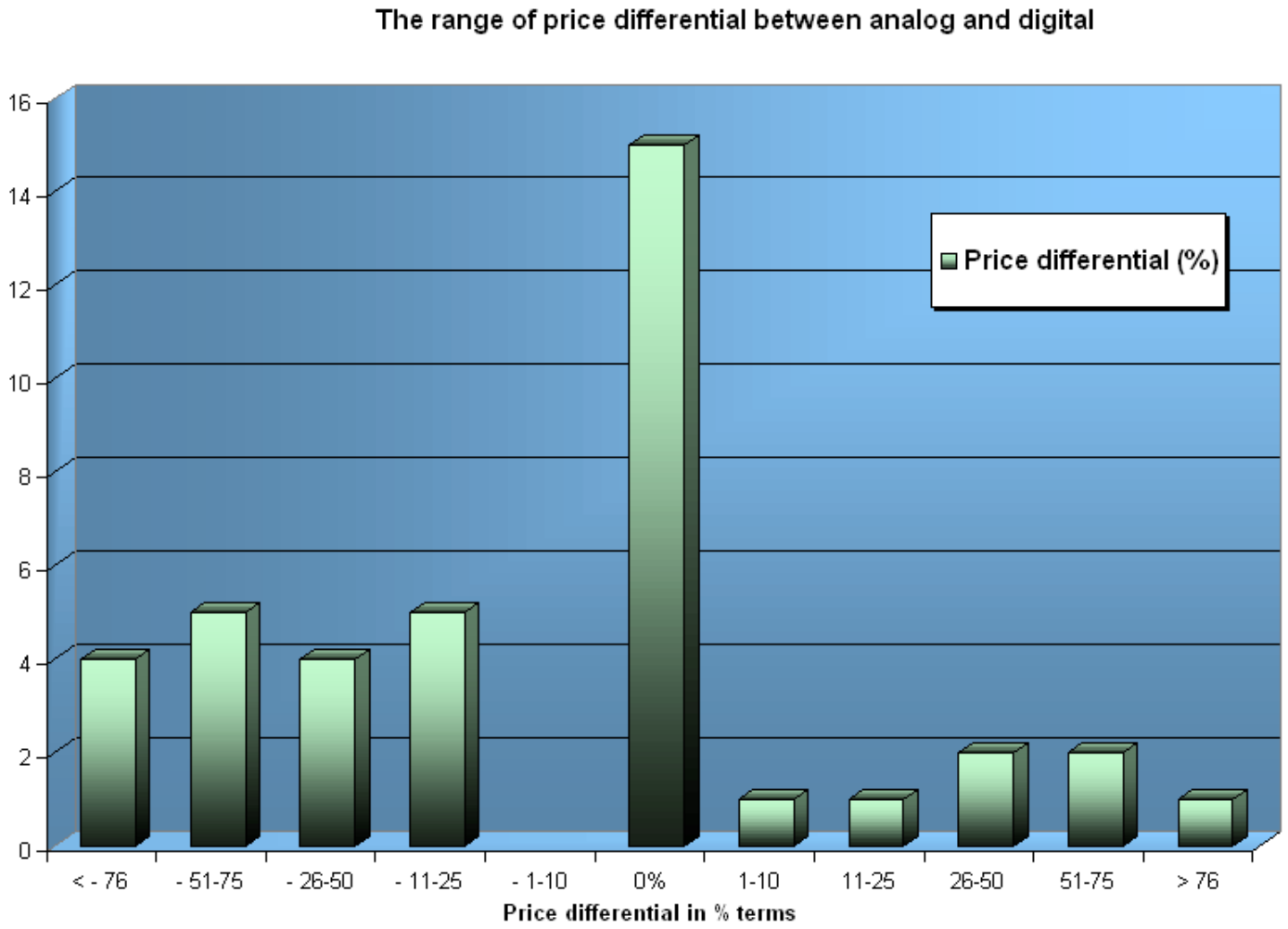


Figure 2: The price differentials between analog and digital



4.3 Interview-based results on policy and pricing models

The following statistics are only applicable to the institutions interviewed and thus give a reading of the maturity and sophistication of these services.

- The average price of an analog item = £19.70
- The average price of a digital item = £14.90
- The average price differential = -22.21% (digital is cheaper than analog)
- Average turnaround time offered = 12.5 days
- 3 out of 15 offered services via e-commerce
- 73% have a website offering the service in some manner

The institutions interviewed are represented by codes in the following text to protect their confidentiality. The section 4.1.1 for more information about the nature of the institutions interviewed.

G = Gallery (2 interviewed)

M = Museum (3 interviewed)

NL = National Libraries (4 interviewed)

PL = Public Libraries (3 interviewed)

UL = University Library (3 interviewed)

4.3.1 Motivation for offering digital reprographic services

There was a distinct sector difference between the institutions in the motivation a) for providing a reprographics service of some kind and b) providing or moving to digital capture and supply.

Some institutions operated an on-demand only service, where the demand was for individual items (single images or perhaps multiple images from a single item such as a manuscript). Others offered project-based digitization of collections of materials, usually to internal departments in their own institutions, some offered both. For some (NL1 in particular), digitization is carried out for internal purposes and the sale of the digital images is from stock only: customers place orders based on lists of available materials on the web site. PL2 digitized a whole collection of tens of thousands of valuable images and provide print and digital surrogates only from this collection. Some institutions digitize from the originals, others (G2 in particular) scan only from existing film surrogates.

University Libraries

The three university libraries (UL1, UL2, UL3) cited user demand as the key driver for offering the service. All supplied mainly to students, academics and publishers. UL1 felt that digital was an easier service to supply than analog; UL2 also remarked upon this, but they supply only digital ‘snapshots’ for proofing purposes while the normal photographic service is unavailable. UL3 also gave preservation as a key factor: not the use of the digital medium as a preservation alternative, but the substitution of high quality digital access for direct interaction with the original, which allows the access to rare/unique originals to be severely restricted.

National and Public Libraries

For the national libraries (NL1, NL2 in particular) preservation was the most important motivating factor. NL1 also felt that the opportunity to create partnerships with other institutions

was highly significant, allowing national and international groupings to form which would better serve the needs of scholarship. This institution also suggested that the sale of surrogates, which were available at relatively modest cost, was offered as a service for scholarship, while for another, the sale of digital surrogates was clearly an important revenue stream. All the Public libraries offered user demand as the main reason for offering digital surrogates. PL3 stated that as the originals are owned by the public in the first place, then the public library's duty is to make them accessible at as low cost as possible.

For NL3, 'digital outputs will attract a broader audience for the collections, given that most people have CD ROMs at home now'. This institution is planning to move completely away from analog to digital because 'users expect it'. The assumption here is that the service is never going to be commercial: if that were the expectation, the respondent would 'cherry-pick' the more commercial objects in the collections, rather than capturing anything requested. NL4 offers all its reprographics services for the public good, feeling that it has a responsibility as a national library to make the collections available. NL4 also expects to generate some revenue. They do not charge reproduction fees for educational use, but do charge for commercial use.

Museums and Galleries
Two of the museums visited, one large national institution, and one small university museum (M1, M2), take fairly similar approaches: for M1, the responsibility to make the collections accessible to the tax-paying public was given as the main impetus, not profit, for M2, too, dissemination and access were key. Here scholarly publication was also cited as a reason. M2 has a policy of photographing all objects upon accession, which provides the master files for stock. This institution had gone over entirely to digital reprographics, having retooled the studio when the photographic equipment was due for replacement.

The group of institutions that differed from all the above in the reasons for offering reprographics services and digital surrogates was the art galleries and museums offering picture library services (G1, G2, M3). All had the profit motive to the fore, though the revenue derives from rights rather than as profit from the creation of surrogates. Revenue from rights was also cited as an ancillary benefit by one of the university libraries (UL2). User demand was also important here: one small but highly significant national gallery (G2) found that this demand was being stimulated by the availability of materials on the web. For G1, the move to digital was small and not particularly significant. One much larger institution (M3) has moved towards the digital on a large scale and is offering images of low and medium resolution images for non-profit use free 'for the public good'. PL2 created digital surrogates from a large collection in order to provide easier access for users, and also to save staff time in fetching analog materials from store. The benefit of conservation of the originals is ancillary to this, but is a cause of great satisfaction.

Conclusions
There seem to be two main reasons for offering reprographics services in cultural institutions, and these do not seem to be different in the analog or digital environments. They are:

- User expectation and demand
- Desire to raise revenue

User services are sometimes offered as secondary to an internal need: if content is captured for internal reasons, revenue from subsequent sales is a bonus. There was no real expectation that serious profits can be made from the capture and delivery process, whether analog or digital, but profits are being made from the sale of rights to use images.

4.3.2 Cost issues and pricing models

There was some degree of consistency in the establishment of costing and pricing structures across the sectors surveyed, though the actual prices charged differed. Motivation for charging at all was also relatively consistent. As will be shown cost recovery is the key term used to

describe the business model in place although few interviewed actually did recover their costs from the sale of the medium. Where profits are made, this tends to be from the sale of rights to use the content. The perceived market price for both material objects and rights was one of the strongest drivers in fixing consumer prices for all institutions, with pricing set by taking account of some internal costs factored alongside what other comparable institutions charge.

Allocation of revenue raised

One factor that makes analysis and comparison difficult on anything but a narrative level is that often prices are set to generate revenue for a unit as a whole, with revenue for some activities being offset against that gained for others: UL1 and M1 both operate on this basis. For some institutions, the revenue is absorbed into a central pot and then allocated across a whole range of services. One public library service (PL4) reported that the income went straight to the local authority, not even to their host library. 33% of the services received the income generated directly back to the service. In all other cases the money was assigned elsewhere within the institution.

The interview results were clear in respect of assignment of revenue from the sale of rights. Unless the institution allowed the service to receive the revenue gained from the sale of rights then they usually operated at a loss in relation to the sale of digital items compared to the direct cost of creation. The only exception to this was NL4 which raised enough revenue to cover their costs fully - it is noticeable that their customers considered their service expensive but obviously continued to use it. One museum based service raised £500,000 per year through the sale of rights and images but estimated that the service cost the museum an estimated £700,000 per year. NL3 feels that it has been falling short in both cost recovery and overheads contributions for some years, but offered the interesting observation that 'digital tends to be cheaper because there are no film costs'. NL2 set prices for analog and digital at the same levels, as the main cost is in the preparation and movement of materials. They flagged the unknown, ongoing costs of digital preservation as a crucial issue.

Range of formats and the effect on prices

There is a greater range of formats, sizes etc made available in the analog than in the digital environment. Often there is a wide range of prices for all types of reprographics, but only one price for digital capture, or a limited range of prices. UL3 was the exception to this, with a wide range of digital formats, which are priced accordingly. UL1 have only one price, which they regard as cheap, for a range of formats, but 'if we charged what some places charge, we wouldn't have a single customer'. UL1 also commented that prices were cheap to cater to the needs of students, and that in the future they might institute a two-tier system for commercial and student pricing. UL2 also have only one price for digital capture but they have only one format—a low quality proof image. NL3 have two major price bands for both analog and digital: a standard service for the home market and a more expensive service for overseas and express orders. The home service has been priced at a level that will cover all direct costs but does not include indirect costs, and there is no profit element. Direct costs include staff, equipment, materials, conservation checking, curatorial research. The more expensive external and express service aims to make a significant contribution to institutional overheads as well. These are around 70% on top of direct costs.

The cost recovery model

Almost all pricing for the creation of material objects, whether analog or digital, is set at a "cost recovery" level in all the institutions. Where profits are made, this tends to be from the sale of rights. Pricing policy appears to be usually set by taking account of some internal costs, factored alongside what other comparable institutions charge.

M1 for instance aim for 'the low end of the market'. Some prices have an element of disincentive to them: UL3 has higher prices for large formats of digital materials as these are so onerous to capture. For NL1, 'price is a useful filter': it deters users who want the digital equivalent of a coffee table book, while being affordable for the serious scholar. There is also

reference to the perceived market price; the service providers interviewed are usually cheaper than the commercial sector, but both they and their users perceive themselves as expensive for a public organization (something not supported by comparisons within this study). For NL4 prices have been set for cost recovery and service investment, but the effect of the slightly elevated prices has been to create some profit, even though the reprographics unit does not receive the rights income. NL4 feel no incentive to reduce prices as they do not want to expand their capacity: price is therefore a filter for too many orders.

PL3 set prices to cover the cost of consumables and the service, with some element of the price also added as a deterrent as they don't want to receive too many orders. They resource the service from within their current staffing and thus could not respond to a higher level of demand as they would not receive more staff to cover it. There was an interesting response to market pricing issues here: a desire not to undercut local commercial prices was expressed, as this was felt to be unhealthy within the local community served by the library. Rights and licensing fees were set with reference to the guidelines of the professional body (BAPLA). 'Our customers own the materials anyway, so we shouldn't be looking to make big profits to give them back copies'.

Some units within institutions received the revenue from the sale of rights, so did not need to examine prices for capture and supply too closely, being comfortably in profit: G1 for instance. Others needed to break even from the supply of the analog and digital objects. Only two institutions had done a full breakdown of all internal costs for both analog and digital supply and set prices accordingly, although reference to the market was made even here. NL3 remarked that comparison of prices with other, even similar, organizations is difficult because of different policies and reasons for charging.

Many of the cost issues in institutions are thus clouded by the charging for rights to reproduce images. Some charge only for right to use the item, and others offset shortfalls in the cost of creation and supply with explicit charges. Fees for rights are set according to what the market will stand, and one respondent remarked that they would charge 'anything from nothing to £1000, depending on what they will pay'. Organizations running commercial services largely only concern themselves with rights sales, but there is no measure that they can use to test if they are charging the right price: it is a subjective assessment of 'value'. Public service and academic institutions have different attitudes to the more commercial ones, operating more for the 'public good' and 'service to scholarship'. But even here, realistic fees are largely charged to commercial clients for rights.

The cost of service development

M1 has established some of its prices for digital items at an artificially low level in order to encourage a move away from photographic methods. UL3, M2 and NL4 are building digital stock from orders from customers, while UL1 does not keep stock, and rescans from the original for repeat orders. This is an institutional infrastructure issue: filestore and networks in UL1 are not able to handle the data volumes and long-term preservation issues of maintaining digital (or indeed analog) stock images. NL4 remarked that, although they keep stock, and would like to aggregate content so that it can be resold, in practice this is not possible as much of the work requested has never been done before. They have recorded no diminution in demand for new work, so clearly orders from their growing stock are a small part of the supply process. There is a key difference between institutions which operate for reasons of user demand, such as the university libraries, and institutions which operate more like picture libraries (M3, G1, G2) where building stock to respond rapidly to requests helps maximize profits from rights. As M3 stated, 'what you're getting is the content of the picture: the medium has no bearing on it'.

Conclusions

- Reference to prices charged by other institutions was made in most cases when setting prices;

- Price is often used as a disincentive, either to encourage users from analog towards digital capture (but never the other way round) or to move them away from formats that are more difficult to supply. Price is also used to discourage too many orders and to keep demand at a level that the institutions can cope with;

- The cultural institutions which offer reprographics as part of their overall mission to serve their perceived audience tend on the whole not to be particularly business-oriented, with the exception of UL3 and NL3.

- The institutions which offer picture-library services with commercial goals are more business oriented, given that they have a profit motive. But even here the cost and pricing models are unsophisticated for the sale of the digital item, given that main source of revenue, and thus focus of the business process, is the sale and resale of rights;

- On the whole, there is no real business planning and modelling in most institutions, and less than 30% of those interviewed had attempted to calculate or quantify the exact costs for creation, storage or service provision of digital items.

4.3.4 Evaluation

No institution surveyed had a formal evaluation process. Most however, had implicit measures of success. Some of these were subjective: user satisfaction, lack of complaints. Some were objective: were financial targets being met? Were turnaround times achieved? Were there repeat orders from customers? The oversight of the services was not formally constituted and did not have a formal evaluation framework.

NL1 stated that giving a quality service and creating quality objects was the most important aim for them, as profile is very important for raising revenue from the State and other donors. NL3 operates according to government-set guidelines that it must adhere to: service delivery is monitored, and stated turnaround times have to be achieved 90% of the time. Revenue targets are clear here, and funding for the service is based upon their achievement. Response time to complaints is monitored, but there is no formal assessment of quality, which however is ‘not felt to be a problem’.

There is an interesting difference between customers who request types of images (picture researchers, publishers etc) and those who need the exact object they seek. The former can go elsewhere if the service or costs are unacceptable, the latter (if the object is unique or rare) have no choice, even if costs are high and waiting times long. This can lead to a slight complacency in some service providers as the uniqueness of the collections give them a virtual monopoly for that cultural object or content to certain consumer bases.

4.3.5 Barriers to service provision

These tended to be many and various, with some commonalities. Two key points came out strongly which reflect the nature of the cultural organizations being surveyed:

- the conservation of the objects

- the protection of rights

Conservation
Conservation during the capture process (analog or digital) is considered high cost. Digital has the advantage of providing a high quality surrogate that is very cheap to reproduce and thus allow curators to be more protective of original artefact.

In some institutions there was conflict between curatorial and reprographics concerns: the reprographics departments were sometimes unable to fulfil their turnaround times because of

bottlenecks in the curatorial divisions. Some large cultural institutions find the greatest cost to be in the curatorial research element in satisfying a request, and in waiting for conservation/preservation assessments.

Rights protection
The protection of rights in the digital world emerged as one of the greatest fears and barriers to further incursions into the digital supply process. For UL2 for instance, internal attitudes are extremely obstructive. There is a real perception of threat from the digital—the institution does not allow its images to be used on CD ROMs for instance. There is no supply of images on the web by UL2, because the move to digital equals loss of control, and there is a perception on the part of senior management that there will be great loss of revenue. PL2 makes most of its digital images available only within the reading rooms, though they are moving further towards web supply. NL1 were also very concerned about the stealing of images: they had discovered a company selling their images illicitly some time ago. NL2 do not provide digital reproductions of in copyright materials as digital copyright issues are seen as more complex than analog. Some institutions are looking at digital watermarking techniques to prevent misuse. 'To promote understanding, we need to protect rights' (G2).

Technical barriers
Technical issues in the provision of digital services was still perceived as a large problem. The movement of large data files puts great, sometimes unacceptable, strain on network infrastructures, and the storage for the long term if these files are retained is an unknowable cost. One manager remarked; 'You can't automate your way round the basic unreliability of the system when you are trying to make it do so much'. Some educational institutions had issues about technical support which was not readily available and could not be afforded by the unit. The costs of long-term preservation, which cannot be passed on to customers, was a concern for many.

Speed of technology change was also an issue: analog cameras would last 40 years if looked after, digital are out of date in a maximum of five. Interestingly, recapitalization for the move from digital to analog proved to be easier in the smaller institutions: M2 has only one photographer, and the move to exclusive digital supply was made successfully when the old analog equipment came to the end of its useful life. In this case implementing the digital option was cheaper than replacing the analog equipment. M3 has many more camera operators, so, though eager to make changes, is unable to move rapidly for economic reasons. For larger institutions the cost of infrastructure and the capital expenditure needed will remain a drag factor in their move towards digital capture and provision.

Lack of finding tools for both users and staff was cited as a problem by NL3, as were issues to do with indexing and intellectual metadata for the growing picture library collections. NL3 also cited the physical nature of the older and rarer materials as an impediment, as well as problems with investment in new equipment.

Staff issues
In some institutions, the public libraries in particular, reprographics work, both analog and digital, is done as part of normal library duties, so lack of staff time could prove a barrier to service development. Training was also pointed to as a barrier—staff in many institutions are having to be retrained quickly, and many are training themselves.

4.3.6 Planned changes

Of those institutions that were planning change, this was on the whole in the direction of more digital capture and supply. However, UL2 felt that there would need to be a change in attitudes of local management before any significant digital capture and supply was undertaken. Others were planning to retool with newer digital equipment: a number mentioned the Kodak DSC ProBack 4020 x 4020 as a good single shot camera that gives good results.

A number of institutions were planning to mount significant collections on the web, with thumbnail and medium quality images available for free downloading for non-profit use (UL3, M3) and databases for interrogation (M1). Experimentation with this has shown some institutions that there are more advantages than disadvantages, and that giving away lower quality images is a good marketing strategy: some commercial clients will use the free images for paste-up, and then purchase the high quality image and the right to use for the actual publication. M1 was also looking at the possibility that users in the reading room could create an image folder which could then be written to CD or printed off. UL3 was planning to move to a more automated order tracking process, so that orders could be taken and tracked online by customers. They hope also to create a surplus eventually in order to allow some reinvestment. NL2 is investigating outsourcing digitization (something already done by NL1).

NL3 is planning to offer self-service scanning in the same way that they offer self-service photocopying, that is, for materials where this would not compromise conservation considerations. They are also planning direct on-line ordering and payment, and wish to make their services more transparent to users, despite the fact that they are offered by different divisions.

A number of institutions were looking into the possibility of collaboration with similar organizations, and into cross-searching of databases of images. The move to digital supply was seen by some as a crucial factor in enabling better co-operation.

5 Conclusions

Some institutions felt that they were being pushed into massive changes without the systems to support them being properly considered. Picture libraries that are part of cultural institutions (rather than purely commercial ones) felt that there was some tension between their public service and their commercial remits: though there was evidence of the commercial subsidizing the other activities. Institutions were not prepared to give away high quality images for printing or downloading, though M3 loan out high quality transparencies for nothing and make money from rights. Very few institutions seemed to have a full appreciation of overall institutional strategies for the move to digital, less than 30% of the institutions appeared to have done the detailed planning or implemented the significant changes required for the move to digital delivery and access.

As noted above, there are generally more price bands for analog reproductions than for digital. A mature service will generally offer a relatively large number of products. The smaller number of price bands for digital supply could also be a function of the medium: a number of lower quality products can be derived easily by the client from the supply of one high quality product. Thus sometimes a consumer will be paying for more than they actually require in the digital arena.

The maturity of business practice in the interviewed institutions seems to divide neatly along the lines of the national libraries, museums and galleries having the clear lead, with public libraries and university libraries just starting to significantly develop their practices in this area. There is however a marked lack of clear commercially led business planning and control in most institutions surveyed, this is not to suggest they are badly managed, but that the financial exploitation of the medium is not the foremost priority. There are a number of reasons found in this study to explain this:

- The service ethic is extremely strong and the institutions primary purpose is public service.
- The services often exist due to consumer pressure not through institutional strategy and thus are not subject to the same strictures.
- The collections the services are providing access to are unique, rare and this creates a virtual monopoly in some cultural and heritage spheres such that the consumer can only access the items from one institution. Therefore commercial interest collides with the public service mandate to provide a mediated price rather than a return on actual costs.
- The charging policies are almost always based upon the perceived market value (as defined by what similar organizations are charging) rather than the actual cost of provision. One institution stated their pricing policy was to be cheaper than organization X and more expensive than organization Y.
- The concept of cost recovery is given attention to but all the costs to the organization are rarely factored in to the equation. Most of the services interviewed could not rationalize the actual cost of creation, service provision and development as a proportion of the price offered to the consumer.
- Many of the institutions are selling the rights to use the content of the analog or digital images. This is the primary purpose with strong business processes, but the delivery of the item in whatever medium required is purely by-product of the main transaction and thus not subject to the same commercial processes or attention. This is indicated by the 37.5% of institutions surveyed that charge zero differential between analog and digital.

The statistical results of the survey found that digital items are offered to the consumer at an average of 10.5% less than the equivalent analog item. In the interviewed institutions which

represent maybe a more mature level of digital service provision the average differential was even wider with digital on average 22.2% cheaper than analog. This indicates a definite pricing trend suggesting that digital items will continue to become cheaper for the consumer to purchase than the analog equivalent. There are several reasons suggested by this study for this:

- The institutions are deliberately trying to encourage the consumer to purchase digital rather than analog.
- This may be because the cost of creation (although not necessarily quantified) is perceived as being cheaper for digital than for analog.
- The cost of making a copy for delivery of a digital item is distinctly cheaper to the institution than the consumable costs involved in delivering analog items.
- Smaller institutions are entering the market for the first time because the option to create surrogates via digital means has become viable because of reducing equipment costs at the entry level. They can respond to consumer demand for the first time at lower cost.
- It is now possible to offer a service that is resourced completely inhouse. 88% of those surveyed appeared to do all production inhouse. This allows some costs to be "sunk" internally and not represented in the price for digital as compared to the need to recover the complete cost if outsourcing the production.
- Digitization projects and external funding for digitization are leading to a body of digital images being available to the institution for the first time, which can then be exploited with almost no additional outlay. For analog items every copy means a consumable outlay.
- The institutions are not yet passing on the cost of data storage or digital preservation as these are not yet understood well enough to become part of the financial accounting chain.

The fact that 72.5% of the surveyed institutions had a website offering the service in some manner and that 25.5% are showing thumbnail views to aid consumer selection is an indication of the growing confidence in the Internet and digital means of delivering services. This seems bound to expand and to mature with better information for the consumer available online to aid their purchase decisions and possibly more e-commerce to speed the sale of items. Indeed the provision of images on the Web does not seem to reduce the potential income of those interviewed but has been beneficial to the sale of rights to use and to the user base in promoting the cultural collections of the institution. The study clearly suggests that digital provides a better platform to promote the collection to a wider national and international audience than analog. Most institutions interviewed planned to increase the number of thumbnail or screen sized images available at no cost to the user. Co-operative strategies between institutions was also promoted as a way forward. All were concerned to retain the rights to the high quality, high resolution images and to assert their rights in any items available on the Internet.

Amongst the clearest conclusions it is possible to draw from this study is that for a service unit to operate at a surplus they have to account for the sale of rights as part of their operation. Very few of the institutions interviewed made more money from the sale of the medium, whether analog or digital, than it cost in creation, management or service provision. The only apparently profitable part of the transaction was the sale of the right to use the material in a commercial publication. All institutions sold rights, but only a few allowed that revenue to be directly linked to the actual service provision of creating, managing and delivering the media to the consumer. Suggesting that, at least in financial terms, the message is more valuable than the medium.

Appendix A: Original project outline

Digital resource cost efficiency and income generation compared with analog resources

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1. Introduction

A key question being faced by digital library developers is that of how marketable, cost efficient and income stable their services and resources are in comparison with previous print based chargeable services. Besser/Yamashita[1], Chapman[2] and Snyder/Davenport[3] identify some of the economic benefits of the digital resource affirming the major role that costing plays in the decision making process to achieve benefits and to measure how benefits are conferred at an institutional level.

A central hypothesis to be tested is that anxieties over reduced income in cultural institutions are actually a perceived loss of gatekeeping rights functions, rather than actual loss of income, if measured against the pre-digital environment. If by establishing the key elements of cost it can be shown that income rarely covered creation costs in the pre-digital environment then the study will query why it would be important to artificially preserve the income in a digital environment.

This study will focus on libraries, museums, archives and similar public institutions that charge for the sale of print and other rights to their holdings and are concerned that digitization will threaten that income. Through relative and comparative cost modelling the study aims to aid the future decision making of funding agencies and project planning in deciding the relative merits of digital resources over analog in terms of their chargeable status and rights issues.

2. The Proposal

The present proposal outlines a study to explore the cost and policy models adopted by cultural institutions in the UK and Europe in arriving at pricing structures for delivering surrogates of unique or rare items as digital objects. How do these compare to delivering the same or similar resource in analog form? The study will explore the thresholds that determine the point when an organization charges for the sale of content and other rights to their digital holdings and the reasons given for such charges.

The starting hypothesis for the study to test are that costing and charging policies tend to be based upon:

- Information from the pre-digital environment that is not always appropriate or transferable.

[1] Besser, H., and Yamashita, R. The cost of digital image distribution: The Social and Economic Implications of the Production, Distribution and Usage of Image Data. Andrew W. Mellon Foundation Project. Final Report, July 1998. http://sunsite.berkeley.edu/Imaging/Databases/1998mellon
[2] Stephen Chapman, Harvard University Library Preservation Center. Guidelines for Image Capture. Joint RLG and NPO Preservation Conference: Guidelines for Digital Imaging. 28 - 30 September 1998, Warwick, UK. http://www.thames.rlg.org/preserv/joint/chapman.html
[3] Snyder H., and Davenport, E. Costs and prices in the digital age: a practical guide to information services. London: Library Association Publishing, 1997

- The highly visible cost factors only rather than the complete institutional costs which are at times obscured and underplayed in the charging structures.
- Perceptions of what would constitute an appropriate revenue rather than directly referenced to actual costs.
- Perceptions of the current acceptable market rate.

Building from a foundation of fact-based numeric data collection and analysis, with a framework of opinion-based research into the underlying reasoning driving charging and rights policies, the study intends to provide solid evidence. This should enable the Mellon Foundation to validate whether the defence of future incomes or increased cost effectiveness are actually being delivered by digitization and current charging policies.

The study will be led and primarily carried out by HEDS with participation by Dr. Marilyn Deegan (Oxford University). This proposal also assumes co-ordination and information sharing with relevant Mellon contacts and the network of colleagues established by the University of Oxford and HEDS clients both in the UK and mainland Europe. The areas of work are:

2.1 Scoping the relevant cost models for a comparative study

It will be essential that a central model of factors most indicative of the relative costs be established to enable the study to collect comparable data. For each factor, research into the most significant elements will be done. The results will be a complete model of elements to be costed and will form the basis for further research during the remainder of the study. This part of the study would be useful to inform future international projects and funding agencies about comparative issues to be considered when assigning budgets to project bids. This result alone would be an enhancement of current practice by informing a more empirical framework for decision making and project planning.

2.2 Finding the comparative costs.

Once a set of elements has been identified they will be tested and refined with a small number of appropriate institutions. The results of this validation exercise will make it possible to gather information from the main 10-20 organisations which have suitable collections and cost policies. The costs will be discovered using visits with structured questionnaires and interviews of people directly involved in accessing, establishing and developing digital library resources within each of the target institutions. Every effort will be made to gather exact numeric values to the questions, but the very nature of costing (especially in terms of staff costs that do not have separate budget lines) means that some 'softer' data will be gathered and values will be assigned by the study team to enable comparison. Where no other means exist then HEDS will work from less empirical data but, for clarity, will keep this separate from other information gathered. The information gathered will also indicate the money generated from rights, prints and other access to holdings in relation to the reasons given for charges or restrictions. In counter point the study will also collect information on the costs of methods implemented to control, track, charge or otherwise restrict access to the digital holdings.

The collected and compared costs will enable the proposed study to measure the relationship between costs of chargeable service provision and the income generated from it in both the analog and the digital environments. This will provide evidence towards whether income actually covers costs in either market environment.

2.3 Thresholds of charging and rights protection

Having found the numeric empirical basis for cost comparison the study will look at the strategic and policy influences behind charging and restricting access to digital holdings. Through structured interviews the study will try to find the given institutional purpose behind charging for rights, access, prints etc in the digital world. The theme of whether this purpose is to cover costs, to restrict use or some other reason will be explored. Further, the thresholds for when such controls or charges are deemed worth implementing will be investigated. Are subject

content and apparent value the key factors, or are technical issues, volume of materials and other factors the determinant of where the threshold to charge and control is placed.

The study will also seek to discover whether the institutions investigated believe there is a significant market for digital images from their collections and if so, whether there are any explicit plans or market surveys in place to validate this belief.

2.4 Analysing and reporting the results of the study.
The final part of the study will be the analysis and comparison of numeric results. These will be converted into a single format to ensure that any comparisons are based on the same scale of measurement. The method for carrying out the analysis, filtering and comparisons will become one of the main deliverables for this study due to the unique nature of the elements being assessed. Basic results and information will be disseminated to the community via a synthesised report and articles in relevant journals.

3 Deliverables

1. Report of framework of elements for comparing digital and analog resource costs.
2. Questionnaires, structured interviews and visit reports for information gathering.
3. Report on method of analysing and comparing results gained from information gathering.
4. Report of final results of comparative costs for digital and analog resources.
5. Dissemination of results to the community.

4 Brief notes on study participants
The study will be led by Brian Robinson, Service Manager for HEDS, at the University of Hertfordshire with the support of Simon Tanner and Joanne Lomax Smith, HEDS Consultants. Further input and guidance will be received from the other study participant, Dr. Marilyn Deegan, RSC Digital Resources Manager at Oxford University.

Appendix B: Email request for information

Exploring the charging models for digital cultural heritage resources

Does your library, museum or archive make a charge for providing either a photographic print or digital copy of photographs, 35mm slides or other photographic materials etc? Do you know of one that does?

HEDS seeks information about any charging practice in place for the sale of analog and/or digital versions of cultural resources. In particular, what prices are charged for the photographic print and what charges are made for providing a digital file (whatever format).

The information we seek at this time is:

- Name of service/organisation that charges:_____
- Website/URL or other contact details for charging service: _____
- What sort of items do they charge for (photo prints, digital files etc)?: _____
- Are the charging structures available for HEDS to access?: _____

HEDS is carrying out an extensive survey and investigation on behalf of the Andrew W. Mellon Foundation and would like to hear from anyone with information that may assist this survey.

Many thanks in advance for your assistance.

Simon Tanner
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Background Information on the study: Exploring the charging models for digital cultural heritage

To explore the charging models for digital content of cultural institutions in the UK and Europe the Andrew W. Mellon Foundation has awarded a grant to the Higher Education Digitisation Service (HEDS).

HEDS will:

- study how pricing structures are determined for delivering digital versions of rare or unique items in libraries, museums, archives and similar public institutions
- investigate how these digital pricing structures compare to those used for the delivery of the same or similar resources in analog form.
- explore the thresholds that determine the point at which an organization charges for the sale of content and other rights to their digital holdings and the reasons given for such charges.

To discover the underlying motivation driving charging and rights policies, HEDS will use relative and comparative cost modeling with a framework of opinion-based research.This work will help the community to compare and assess costs for delivering digital content against a realistic model.

HEDS provides consultancy and production services for digitisation and digital library development to all sectors of education, libraries, museums and other non-profit organizations.

Appendix C: Query set for the survey

Basic units of measurement for all institutions surveyed

1. Record the end user price tag for an analog surrogate.

2. Record the end user price tag for a digital surrogate.

3. Record and remove from the above price tags any copyright/IPR element to the pricing.

4. Record and remove from the above price tag any shipping or delivery charges, media costs and exclude VAT or other taxes.

5. Measure the percentage difference between the basic price tags for analog and digital.

6. Payment methods: Used as measure of sophistication of institution.
   - Payment in advance required or on delivery?
   - E-commerce
   - Credit card
   - Cheque/bank transfer
   - Invoicing
   - Other

7. Services: measure and compare services as a means of factoring this into a comparison – i.e. is the object more expensive due to the service level?
   - Website offering service?
   - How do users select the items required – thumbnail previews available or via catalogue?
   - Turnaround times offered between order and delivery.
   - Volume and coverage of items offered
   - Formats and range of outputs offered
   - Customer service – apparent ease of ordering and use of service

Scoping measurements to provide context for pricing (comparisons of sophistication)

1. Record the profile of the host institution – its size, purpose, status (i.e. charity, not for profit, for profit)

2. Does the host institution have any e-commerce activities – record their nature and scope.

3. Record information about the service provider within the institution – size, purpose, status.

4. What is the core audience the service provider seeks to serve?

5. Do they create their own surrogates or is this function outsourced in any way?

6. Level of integration of the service within the host institutions other business processes.

Appendix D: Structured interview

1. Payment methods: Used as measure of sophistication of institution.
   - Payment in advance required or on delivery?
   - E-commerce
   - Credit card
   - Cheque/bank transfer
   - Invoicing
   - Other

2. Services:
   - Website offering service?
   - How do users select the items required – thumbnail previews available or via the catalogue?
   - Turnaround times offered between order and delivery
   - Volume and coverage of items offered
   - Formats and range of outputs offered
   - Customer service – apparent ease of ordering and use of service

Scoping measurements to provide context for pricing (comparisons of sophistication)

3. Record the profile of the host institution – its size, purpose, status (i.e. charity, not for profit, for profit)

4. Does the host institution have any e-commerce activities – record their nature and scope.

5. Record information about the service provider within the institution – size, purpose, status.

6. What is the core audience the service provider seeks to serve?

7. Do they create their own surrogates or is this function outsourced in any way?

8. Level of integration of the service within the host institutions other business processes.

Detailed information

1. Gain a breakdown of the price tag offered for the analog and digital surrogate and record as a percentage of the total price (to enable comparisons).

2. What is the **cost of creating the surrogate as a percentage** of the price tag.

3. What is the **cost of service provision as a percentage** of the price tag. Include storage and preservation costs if known.

4. Record the profit element – i.e. **what proportion (%) of the price tag which is retained** over and above the cost of providing the service and creating the content.

5. Record how the institution assigns the revenue gained from the sale of the surrogate – e.g. does it all go to the service provider, is some taken by various Depts or the host institution etc.

6. Volume of sales, revenue raised

7. Cost of service provision – number of staff, budget, equipment etc.

8. What is the **motivation and objective** for providing the service?
9. What is the motivation and objective behind the **pricing structure**?
10. **How was the pricing structure gained** – what method was used to define price? Was reference to other services/competitors made in the design of the pricing structure?
11. **Is the service evaluated?** What are the **measures of success** (e.g financial, service objectives, number of sales etc)?
12. What are the **perceived barriers to service provision** (e.g. technology, copyright, pricing, experience, institutional investment, payment gathering etc.)?
13. Are there **any planned changes or developments to the service** in the future (next 12-18 months)?

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Key services researched

AHDS - Arts and Humanities Data Service - http://ahds.ac.uk/

BAPLA - British Association of Picture Libraries and Agencies - http://www.bapla.org.uk/

SEPIA - Safeguarding European Photographic Images for Access - http://www.knaw.nl/ecpa/sepia/

TASI - Technical Advisory Service for Images - http://www.tasi.ac.uk/

VADS - Visual Arts Data Service - http://vads.ahds.ac.uk/

Appendix F: List of Coded Institutions

Galleries

G1	The National Gallery
G2	The National Portrait Gallery

Museums

M1	The British Museum
M2	Pitt Rivers Museum
M3	The Victoria & Albert Museum

National Libraries

NL1	Czech National Library
NL2	Bibliotheque Nationale de France
NL3	The British Library
NL4	The Royal Library, Denmark

Public Libraries

PL1	Bavarian State Library, Germany
PL2	Manchester Central Library
PL3	Birmingham Public Library

Universities

UL1	Cambridge University Library
UL2	John Rylands University Library of Manchester
UL3	Oxford University Library Services

Appendix G: List of institutions in the survey

1. Aberdeen Art Gallery and Museum
2. Axis - Leeds Metropolitan University
3. Bavarian State Library
4. BBC Natural History Picture Unit
5. Bibliothèque nationale de France
6. Birmingham Central Library
7. Borthwick Institute of Historical Research York Univ
8. British Library
9. British Library of Political and Economic Studies
10. British Museum
11. Cambridge University
12. Centre for Buckinghamshire Studies
13. Czech National Library
14. Derby Local Studies Library
15. Devon Library and Information Services
16. Edinburgh University Library
17. Grosvenor Museum, Chester
18. Hertfordshire Archives and Local Studies
19. Israel Museum, Jerusalem
20. John Rylands University Library of Manchester
21. Kings College london
22. Kirklees Council
23. Leeds University
24. London Metropolitan Archives
25. London's Transport Museum
26. Manchester Archives and Local Studies
27. Moray Council - Musuem
28. National Gallery
29. National Library of Scotland
30. National Library of Wales
31. National Maritime Museum
32. National Portrait Gallery
33. Newcastle University - The Robinson Library
34. Norfolk Library & Information Services
35. Northamptonshire Library & Information Service
36. Oxford University
37. Pitt Rivers Museum
38. Royal Library, Denmark
39. School of Oriental and African Studies
40. Southampton City Libraries
41. St Georges Hospital Medical School
42. Suffolk Record Office
43. Tyne and Wear Museums
44. University College London
45. University of Aberdeen Historic Collections
46. University of East Anglia
47. University of Glasgow
48. University of Graz, Austria
49. University of Kent
50. University of Wales Swansea
51. Victoria and Albert Museum