Teaching in Cultural Economics
Edited by Trine Bille, Anna Mignosa, and Ruth Towse 2020
Edward Elgar Publishing Guides to Teaching
Chapter 27 Digitization in Museums (pp. 204-213) by Trilce Navarrete

Digitization in Museums

Trilce Navarrete

Introduction

Digitisation now supports and enhances all aspects of the work museums do, even if the technology was initially perceived as a contradiction for cultural institutions that revolve around their physical collections. Though we mostly think of digitisation in relation to online exhibitions, digital technology has become essential in the overall management of collections. Museums increasingly connect all the information related to the objects in a digital repository, including images, history of the object, conservation reports, exhibition texts, related publications, and physical location of the objects using a form of barcode. Creating such repository of information increases efficiency in the work-flow; in effect it substitutes 'capital', that is data processes, for labour. Once created, museums can easily reposition selected content to the Internet allowing remote access to information about the collections. Digitisation hence represents the adoption of a new working form supported by a technology that allows museums to participate in the information economy. It also represents a significant investment. Aside from the machinery and training of staff, the greater cost remains the migration of all the collection's information into an up-to-date content management system. The digital dissemination of collections online represents hence only one aspect of the digitisation work in museums.

In this chapter, three approaches to study digitization in museums will be discussed: the museum as a firm adopting a new technology, museums serving a demand for digital cultural services, and museums developing strategies to remain relevant in a digital future.

The museum as a firm

When analysing the museum as a firm, cultural economics can provide a framework to identify the inputs and the outputs that can be associated with digital technologies, which in practice involve all activities of the museum. Museums generally have various outputs - collecting, preserving, researching, communicating, educating, exhibiting - and may also include a shop. Inputs refer to sources of financing and labour but also to the capital stock, which includes the objects in the collection, the building, equipment (hardware and software), and most importantly, the information about the

collections. The latter is intangible capital when resides in curators' heads, but can be made tangible when their knowledge is stored in an information system, initially paper-based but increasingly stored in a digital collections information management system, which is referred to as the *digital collection*. As with the physical collection, the digital collection involves further collection of new facts or images about the objects, preservation and migration of the data, and exhibition, for instance on a website or an app. It also increases access via the Internet and may thus increase demand for museum services. Both physical and digital capital stock require preservation and restoration in order to prevent decay, and can increase in value when enhanced, for instance, through additional research.

Much of the costs take place up-front while benefits may become visible in the future, and costs of digital activities are not easily identifiable. While digital activities used to be considered distinctly, as a *digital object* or *digital exhibit*, digital is increasingly an inherent element in all activities. Furthermore, museums often lack a specific digital activities budget. Still, trying to identify the inputs and outputs related to digital activities can be a revealing exercise to inform future use of resources.

Accounting for the flow of resources related to the digital contribution is challenging because inputs are often not earmarked for digital activities but instead financed through other activities, such as an exhibition, which may involve digital imaging, or research, which may include the development of new software. Similarly, inputs may lead to multiple outputs so that investing in a new collection's database, for instance, may improve object administration, object preservation, research, and exhibition activities many years from now.

Learning objectives for understanding cultural economics: Theories of the firm can facilitate understanding the role of digital technologies in the way museums function internally and their relations to other constituents, such as funders, consumers, or competing firms. By identifying the inputs and outputs, students can trace the flow of resources linked to digital technologies, or gain insight in the reasoning behind an investment decision and its expected result. Infrastructural projects (capital investment), such as a state-of-the-art digital repository, may benefit from collaborative efforts, which rise questions of ownership, financial, and legal responsibility.

The wider application of digital technologies is in fact the result of increasing awareness of the role of museums as knowledge banks or data centres where quality, authentic, expert information can be found about a number of topics, including history and art, science and the environment. In our knowledge economy, information is a valuable asset. One important concern in the online publication of collections is the clearance of intellectual property rights, which may involve the artist, the photographer, but also the researcher providing information to identify the object (that is, metadata).

Adopting a digital work practice requires a significant investment, for the hardware, software, and skilled staff but also for adjusting the work-flow. Firms invest in new technology to reposition their goods and services in the market. Museums can innovate in their organisational form (for example, by hiring new skilled staff, or adopting new managerial forms, such as creating a Chief Technology Officer position), or in the services provided (for example, an online shop or website), or in the way content is treated (for example, providing a digital scan of an object, or 3D imaging). In turn, museums can reduce 'ordinary' labour and make it more productive.

Student activities: For a class discussion, have students look at the website of a museum and list the various inputs and outputs of the museum and identify the areas that are digital. You may identify some specialised staff, such as 'data managers' that are responsible for the maintenance of the digital collection. However, it is often impossible to isolate the digital side of museums, so that curators may use the digital collection to develop a future exhibit but may not necessarily need to be 'digital curators.' Important in this activity is to differentiate the tangible and the intangible capital of the museum, where the digital collection corresponds to the tangible asset and the knowledge about the objects to the intangible. Curiously, digitisation allows for intangibles to become tangible, making the collection information system perhaps the most valuable physical asset of a museum. These are all topics students could discuss.

Once a general list of inputs and outputs has been identified, students can further work on specific questions, either in small groups or as essay topics, for instance:

1. If you were to create an exhibit, how would you use the digital technology and what would you need to make it happen? How would that be different than a digital exhibit?

Learning objectives: Students are asked to think of all the inputs that can be directed towards the one output. You can select other outputs, like conservation, education activities, research, or a shop. Students will become aware that digital activities are present in all areas of museum work.

2. How would you apply digital technology to position the museum innovatively?

Learning objectives: This is about positioning the museum as innovator through the adoption of digital technology. Students may note that museums may approach innovation depending on the available resources and position in the market: a superstar museum with large resources may invest in machinery for scanning (which requires skills in-house), while a small museum may invest in a new website (which may be outsourced).

3. How would you make use of digital technologies to ensure your capital does not decay in value and instead increases?

Learning objectives: This is about understanding the difference between tangible and intangible capital and its ability to enable a flow of services when maintained. An example is the documentation of collections information to preserve intangible capital (knowledge) to prevent decay (for example, if curators retire), or the use of digital images (physical capital) to generate additional services (for example, a website).

4. How would you prioritize your digital investment?

Learning objectives: Students are to think about efficiency in the use of resources. For some museums, for example, the goal may be to have greater number of images which may require a lower resolution than for museums wanting high quality digital imagining even if only for a small selection of objects. Some museums may invest in activities that generate more visitors or additional income, while others may prioritise preservation or research.

Evaluation criteria: Extent to which the student is able to understand the processes related to the use of capital and the flow of resources to generate cultural services, assisted by technology, to position the museum in the market, through the application of theories of the firm.

Reading suggestions for the topic and related materials:

Volume 22, numbers 2-3, of the *Journal of Cultural Economics* is devoted to explain Museums from multiple perspectives (1998). For a recent application of the theory of the firm see Navarrete, Trilce (2018) 'On the Economics of Physical and Digital Collections in Museums' in *Uncommon Culture: Cultural Heritage, Real and Virtual*. 7(1/2):57-73. https://uncommonculture.org/index

Demand for digital culture

Theories of demand can be applied to explain the place of the museum within a digital environment, by studying the consumer's participation in relation to price or availability. Topics to discuss include taste formation, economics of attention, networks, and (social) valuation. Taste formation has to do with the key characteristics of culture: cultural goods are complex, unique, experience goods that derive greater utility when consumers understand them. That is, the ability of an individual to appreciate a (digital) painting depends on the utility and pleasure derived from its consumption, which is directly linked to the knowledge and understanding acquired either though study or during past consumption as well as to the individual's taste. Taste formation is the result of a consumer repeatedly spending resources (for example, time, money) to consume a cultural good. It may even result in rational addiction when the more you consume a good, the more of it you want of it, something cultural economists have identified in the demand for cultural goods and services.

Because of the complexity of cultural goods, consumers often rely on critics to support their selection. The Internet has given space for an array of new intermediaries that serve as critics of cultural goods, such as social media to rate exhibitions. Museums may respond by joining the platforms to influence consumer valuation or may join popular online networks to increase visibility. Online platforms tend to favour certain content use and so interviews with curators may be popular on YouTube, images of objects may be placed in Instagram, and the biography of the artist may be found in Wikipedia. Consumers of such platforms may be also the producers of the content.

Online branding, by which museums seek to differentiate their product, is easier for museums representing one artist (for instance, the Van Gogh Museum in Amsterdam), while museums with less iconic works may struggle to position their collections online to communicate with (potential) consumers. A museum's online presence can be evaluated by noting the frequency of posts, the type of content, and the level of consumer engagement in the major online communication channels. Analysis of the online shop may further reveal consumer preference patterns.

The first limitation on consumption is the availability of cultural goods and services that can be accessed. In the physical world, going to one museum does not mean one will be able to access all the paintings of the world, as each museum has a specific collection – of which only some is displayed. A global digital museum could solve this by allowing consumption of all the digitised museum collections, all the time from anywhere by anyone with Internet access (see Google Arts and Culture Institute as example). Experience shows that there are certain favourite objects that receive a greater number of views. Understanding popularity online, and the incentives that drive consumers to click on certain objects over others, can serve to explain social systems of valuation. In the digital environment, consumers will show a

preference for content that, in addition to providing greater utility, is unrestricted, sustainable and reliable. In other words, consumers prefer free and convenient access to their content of choice, ideally if it comes from a trusted source.

An intriguing topic remains the relation between the online and the onsite exhibition of collections (will visits to the museum decrease if collections are available online, that is, are they complements or substitutes?). It is important to note that few museums offer proper online exhibitions while a growing majority display only a digital catalogue, perhaps interesting to researchers. In the use of social media, museums often exclude storytelling, which is central in exhibitions. As new products and services develop, the digital and the physical increasingly merge to deliver new consumer experiences that facilitate digital cultural consumption. One important point to remember is that consumption of digital content of museums can take place online but also onsite at the museum. Digital technology increasingly allows museums to monitor user journey mapping, which may even reveal preference for physical exhibitions.

Learning objectives for understanding cultural economics: Consumer theory can be used to understand preferences in relation to what the museum offers. Availability of museum content online can exponentially shift consumption. The public good characteristics of non-rivalry and non-excludability in digital supply make for problems in charging for access to digital collections. Though pay-for-access online services are successful for the music industry, museum content online is generally available for free. Museums can license the use of collection images for specialised consumer groups, directly or through marketing image banks. Cultural participation statistics that focus specifically on demand for online museum content remain limited and so an alternative is observing consumer behaviour encountering content online, such as length of visit or number of clicks in various sites. Data on physical exhibits using digital technology can be found for individual museums; its application is as varied as the exhibitions themselves, slowing comparative analysis across the sector.

Student activities: Ask students to visit a museum and note the digital technology available. Are there touch screens or digital hand-held devices provided? Can consumers 3D print their favourite sculpture? Once the digital side of the physical exhibition has been discussed, ask students about accessing the museum online. Is it only through the organisational website? Can you purchase a ticket online?

In small groups, or as essay topic, you may want to discuss the following questions:

1. Why would a museum want to publish information about the collections free of charge online?

Learning objectives: This question is about discussing the effects of digital publication on the process of consumer's taste formation, which may respond to an educational mandate or may be driven by a marketing strategy. Important is to note the difference between exhibitions online (including objects and a story based on research) and marketing activities with partial or no collection information.

2. What makes for a good physical museum visit that involves digital technology? How is that different from the online environment?

Learning objectives: To identify digital technology as a tool to potentially enhance the physical experience. Utility from consumption of collections follows a cultural valuation scale (aesthetics) while digital consumption is also informed by

an information scale (convenience). Students will become aware of the role of price and judgement devices (for example, social media reviews) in the valuation of digital cultural goods.

3. Can you compare consumption of digital images from a museum to consumption of digital recordings of music?

Learning objectives: Students will note that digital technologies award new forms of cultural consumption which may represent a shift in consumer behaviour, such as willingness to pay practices.

4. How can an online museum define its *walls*?

Learning objectives: Students will learn to identify digital consumption of museum content outside of the museum environment (building or website), which may serve a specialised market. This may be of special interest for marketing students.

Evaluation criteria: Awareness of incentives for consumption of museum content when a digital layer is applied, online or onsite, including role of price, recommendations, online network, and format (ease of access).

Reading suggestions for the topic and related materials:

Bertacchini, Enrico and Morando, Federico (2013) 'The Future of Museums in the Digital Age: New Models for Access to and Use of Digital Collections' in *International Journal of Arts Management*, 15(2):60-88. A general chapter on 'Museums' by Navarrete discussing demand can be found in the *Handbook of the Digital Creative Economy* by Handke and Towse (eds.) (2013).

Museums in a digital future

Digital technology continues to change, both in what it enables but also in how we interact with it. The smart phone is barely used for calling and instead we use it as alarm clock, camera, and to access the Internet. As the cost of digital technology decreases, museums and consumers will find new ways to interact with collections. One important challenge remains the connecting of datasets across collections and institutions to fully integrate information, so that consumers (and computers) can benefit from full contextual information. The effect of having greater accessibility to collections via digital media is just starting to become apparent yet data on it is scarce. Theoretically, it can be expected that an increase in the availability of good quality information will stimulate innovation, as indeed limited evidence suggests that entrepreneurs in the creative industries (such as fashion and film) may find inspiration for new works in the vast digital collections of museums.

Projects like the Google Arts and Culture Institute have emerged from the recognition of the value of high quality, authoritative, unique, millenary information housed in museums, where thematic stories join the collections from all over the world to be accessed free of charge. Google benefits by adding data to its repository, to harvest and to train its algorithms, while high consumer numbers are expected to continue to access one of the top global websites in the world; however, actual data on numbers is unavailable.

Making resources available to advance digitisation in museums, for instance, to research and develop the use of artificial intelligence for linking data to lower labour costs, requires evidence to inform strategic decision making. Current statistics on the size, cost, and access to digital collections are scarce. Efforts are underway to improve the methodology and coverage of the datasets. The main challenge is trying to estimate the spill-over effects, where investment of digitisation in the museum serves not only internal management of the collections or direct consumption of exhibits, but can also serve to enhance the information infrastructure of a region.

Learning objectives for understanding cultural economics: From a welfare perspective, the role of museums is to collect and preserve objects and knowledge for the benefit of present and future generations: however, the present generation has to finance the benefits of future generations, though they are likely to be better off due to economic growth, which leads to market failure. Moreover, maintaining the cultural inheritance benefits citizens, present and future, even beyond geo-political borders, including consumers and non-consumers. Also, because most objects in museums are unique, there is a monopoly - the Mona Lisa is only to be seen at the Louvre in Paris. However, online distribution may alter provision and may result in large online players monopolising access. This is particularly the case for smaller or more obscure collections for which our only chance to consume them is through the Google Arts and Culture Institute, for example, because we otherwise would not know of their existence and because of the cost incurred to access them. Adopting the approach of welfare economics enables us to think about inter-generational benefits and costs and the implications for the finance of museums as providers of cultural heritage as well as the welfare effects of monopoly.

Student activities: This is the most abstract section of this chapter and it has to do with the externalities of digitisation in museums. The difficulty arises due to the lack of data on digital cultural consumption, the costs of digital collection publication online, and the effect beyond the actual click.

In small groups, or as essay topic, you may want to discuss the following questions:

1. What evidence would you need as a museum to explain the effect of digitisation in museums?

Learning objectives: Students are to identify the role of indicators to develop evidence-based policy for decision making at the institutional level and higher policy level, being the Ministry of Culture, or the UNESCO.

2. What is the value of an information infrastructure rich in cultural content?

Learning objectives: This question is about discussing the effects of digital publication on the process of knowledge transfer. Museums are often seen as informal schools, to support the education system of a region.

Evaluation criteria: This is for the most adventurous students. Arguments should reflect awareness of the complexity of measuring knowledge transfer and other externalities of museum work, particularly when digital content is available freely via the Internet.

Reading suggestions for the topic and related materials:

Potts, Jason and Cunningham, Stuart (2008) ‘Four Models of the Creative Industries’ in *International Journal of Cultural Policy*, 14(3):233-247.