

ICT investment considerations and their influence on the socio-economic impact of heritage sites

Jim McLoughlin, Jaime Kaminski and Babak Sodagar

Brighton Business School, University of Brighton, Brighton, UK.

Abstract

The following methodological model can be used as a platform for the study of the impact of information and communications technologies (ICT) at cultural heritage sites. The model has been developed through extensive, in-depth interviews with curators, directors and stakeholders at many cultural heritage sites across Europe. The underlying strength of this model is its versatility. Although the model is oriented towards the investment in, and deployment of, ICT at heritage sites it is fundamentally about understanding the process of investment and so could be modified for many investment decisions.

Categories and Subject Descriptors (according to ACM CCS): K.6.1 Project and People Management: Strategic information systems planning.

1. Introduction

Heritage site managers and policy makers often ask the question: "What is the impact of a particular ICT deployment at a heritage site?" Usually, this kind of question is answered through an assessment of the usability of the technology concerned, or attempting to link increased visitation to the deployment. Although such analyses have their value they are simplistic. The impact of an ICT investment and deployment on heritage sites and their visitors is an incremental impact. That is to say it is an impact that occurs in addition to, and as part of the wider impact of the site. ICT does not exist in a vacuum divorced from the heritage system – ICT is part of the heritage system. The incremental impact of an ICT deployment cannot therefore, be viewed in isolation from the non-ICT impacts and outcomes associated with a particular heritage site. The success or failure of a particular ICT project is, more often than not, a function of factors outside of the realm of IT. Politics, design, and location amongst others play an important role in the success and failure of an ICT deployment. The success or failure of a project determines its socio-economic impact as much as the technology itself. It would be a gross simpli-

fication to think that technologies can be studied in isolation from these external factors.

2. Understanding the site

The holistic framework model (see Fig. 1) seeks to understand and conceptualise the dynamics of heritage sites. The framework consists of five elements: the cultural heritage site (CHS) impact context, the site mission and objectives, the site stakeholders, and the site management and decision making context, which all influence and contribute to the potential socio-economic impacts of a heritage site. This model provides a site context for the following model which is specifically oriented towards the deployment of ICT (see Fig. 2).

When studying the 'impact of technology' it becomes apparent that any analysis is meaningless without consideration of what makes each heritage site unique. Different sites have different strengths and weaknesses strong brands, exceptional collections, extensive financial resources, highly accessible locations, high footfalls, etc. Different sites also have different rationales and objectives for deployment of ICT. If the impact of ICT is divorced from these contextual

factors then the result of a study will lose its meaning. This model allows those studying heritage sites to place them in the same conceptual framework.

2.1. The impact context

The impact context is interpreted broadly as the specific macro-contextual influences and micro-contextual (such as organisational) influences on a cultural heritage site. Macro contextual influences can include: macro-economic environment, policy context, legal framework, cultural context and values and technological context. The micro-contextual influences exist at two levels; the local environment and the site. These influences can include the local environment (economic, political, funding, demographic, legal, competition, infrastructure, etc) and the site (funding, ownership, governance structure, scale and location).

For heritage managers the impact context creates opportunities and threats for their organisations and can impose constraints on decision making. Most of these factors are beyond the direct control of cultural heritage managers, but nevertheless affect heritage site strategies and final impacts and outcomes. Furthermore, many of the factors are inter-related and so for example, local economy could affect heritage site funding or the policy context could affect the legal framework.

2.2. The macro context

Each site operates in a macro-national context (and wider European and global context). A number of influences from this context affect heritage sites, including:

- *Macro-economy*: The macro-economy (regional, national and international) affects, for instance, tax revenues, disposable income, and policy funding priorities. The macro-economy has a major influence on the heritage sector.
- *Policy context*: The macro-policy context is another important determinant for potential outcomes and impacts at heritage sites. Policy is fundamental to understanding impact; it influences heritage sites at multiple levels. It determines what gains funding and what does not, what is conserved and what it is not, it influences local authority policy, and it can also affect national legal structures which influence the heritage sector, etc. [MR04].
- *Cultural context and values*: The 'cultural context' and values of a society in supporting heritage, will in turn affect practical policy and funding priorities. For example, the cultural context helps define what is considered to be heritage. As such, definitions of what should be preserved can differ between countries. Furthermore, the definition of what

constitutes 'heritage' is not static but dynamic. In the developed world the definition of heritage has broadened considerably in the later half of the twentieth century. It is important to acknowledge that as time passes the definition of heritage will continue to change according to different political aspirations, and the increasing input of communities and groups outside of the traditional field of experts.

2.3. The micro context

The micro context can be classified at two levels the local environment and the site:

- *The local environment*: Micro factors would include the local economy and local policy and political context. For example, numerous local authorities and governments have developed strategies, with accompanying funding, targeting heritage as a key element in regeneration programmes. In heritage sites with a strong orientation towards tourism, a principal element of a sites economic impact will depend on the total visitor experience which itself is dependent on numerous off-site factors (e.g. coordinated local tourism strategy, the presence of other visitor attractions, quality of facilities such as transport, restaurants, hotels, etc). It is rare for a heritage site to be immune to these factors.
- *Competition or complementarity*: The degree of competition or complementarity with other attractions can also influence impact. For example, a heritage site within a historic urban centre (such as Rome, Venice or Paris) could face competition from numerous alternative heritage attractions; however, the nucleation of heritage sites within a town or city can act as a stimulus to attract visitors. In such cases the visitors would be more likely to be interested in heritage tourism. Such situations have been given the label 'co-opetition'. Of course, the competition is not limited to other heritage sites, any attraction which could divert tourist money away from heritage represents potential competition, but the creation of a diverse tourist product offering is likely to be beneficial for attracting a more diverse range of visitors.

2.4. The site – organisational context

Organisational context is central to understanding impact. The impact of any site is heavily dependent on its location, quality, significance and the scale of the heritage site itself. As sites vary in their local, regional, national and global significance then so will their relative impacts. Some factors to consider include:

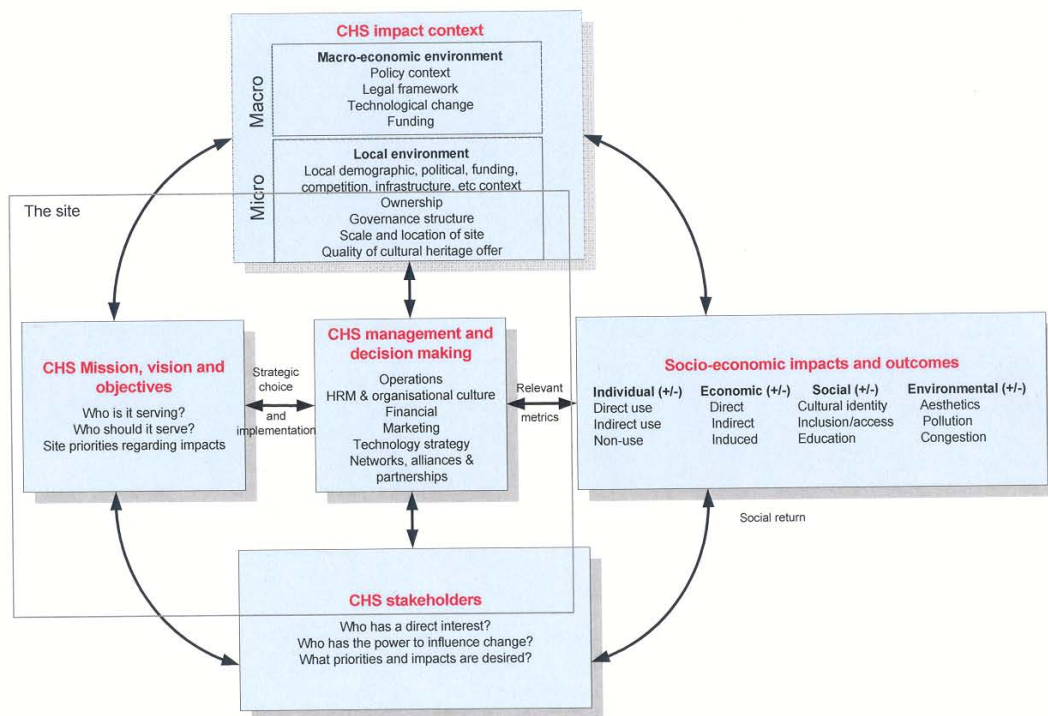


Figure 1: A dynamic holistic impact model for cultural heritage sites [MSK06]

- **Ownership:** The ownership of heritage sites is a key determinant of the impact that a site will have. Ownership influences funding sources, governance structures, objectives, etc. However, ownership of heritage sites is not static. For example, because cultural heritage sites can have high maintenance costs especially in countries with strictly enforced legislation regarding the upkeep of such sites. There is a tendency in such countries to see the movement of ownership from private to public hands.
- **Corporate governance:** Heritage sites can have a wide range of governance structures ranging from private and public, to not-for-profit and charities. Each of these will influence the impacts and outcomes of a heritage site. While it would be simplistic to assume that all sites under private ownership have a greater profit motivation than sites in public ownership there is a trend towards this scenario that cannot be ignored.
- **Location:** Location is paramount for the impact of a cultural heritage site. The location determines factors such as accessibility to transport networks,

proximity to population centres links with other potential attractions. Surprisingly, location can be a dynamic entity. Although cultural heritage sites are fixed entities within the landscape or urban fabric the significance of the surrounding locality can change over time. A rundown part of an urban centre can become a popular tourist zone increasing the potential of the heritage sites within that area (such as the Gothic quarter Barri Gtic in Barcelona, preserved through neglect and now one of the principal tourist magnets in the city). Alternatively, the creation of new transport links such as low cost airline routes, or motorway and train-links can radically change the accessibility of a heritage site.

- **Quality of the cultural offer:** This exists at two levels. The significance of the site to society, and the quality of the 'visitor offer'.
- **Significance:** The significance and importance of a site is a difficult entity to define. Sites have significance at multiple levels such as local, aesthetic, regional, and national. Of course, as with so many elements of the dynamic impact context the signif-

importance of cultural heritage sites is not a static element, it can change over time. It can change because of changes in the political system, technology, etc. Even at a single point in time a site may hold alternative significance to different elements of the population – this can determine who visits a particular site.

- *Quality of the visitor offer:* The quality of the visitor offer at a heritage site or experience can be determined by a number of factors such as the level of preservation, which lies outside the scope of the heritage site, however, site maintenance, level of restoration and visitor facilities tend to fall within the potential control of a site, finance depending, as can the actual or perceived authenticity of the site. Contemporary Western society is a consumer society. In this society the public have been exposed to progressively more sophisticated products, services and marketing, and as a direct result they have become much more sophisticated consumers. It is these same consumers who visit heritage sites and they will judge those sites accordingly. Facilities and services at heritage sites need to be at a standard commensurate with contemporary consumer ideals otherwise sites risk alienating many of their visitors.
- *Scale:* Scale can act as a guide to the potential impact of a cultural heritage site (although, no more than a guide). Larger sites have the potential to induce a greater impact than smaller sites, because of their ability to support a greater throughput of visitors, sustain larger potential capital costs, higher staff requirements and running costs. Of course, groups of smaller heritage sites can have a similar effect.

These factors have a strong influence on the site and feed into the management decision-making context. Furthermore, it is argued that contextual factors are immensely important determinants of the socio-economic impact of heritage sites. Placing a heritage site in context will guide what impacts that should be evaluated. For instance, there would be little point in doing a full, and often costly, economic impact analysis of a small local museum that was designed to serve the local community and foster local cultural identity. In such a context impact assessment should be aimed at issues of community integration and social inclusion, etc. In the dynamic model there is the potential for sites at the micro-contextual level to have some influence over the ‘impact context’. Cultural heritage sites have a greater potential to influence and have an impact on the micro context compared to the macro context. Some heritage sites can make a (sometimes significant) contribution to the local economy through increased visitor numbers, capital expenditures, or brand value.

3. The technology impact context

The development of ICTs takes place outside of the cultural heritage sphere (usually in the commercial, scientific or military sectors) and gradually migrates to the heritage sphere. With new ICT hardware, software and their associated standards being developed continually, it is important to consider technological developments and how these might affect the visitor experience. Changes to the non-technology elements of the heritage site and its wider context can have wide ranging effects on the impact and outcomes of an ICT deployment. A number of factors affect the technological impact context, including:

- *Development of ICTs:* The ICT deployment in heritage sites exists within a wider ‘ICT and technology’ context. At the most fundamental level, what ICT is available is dictated by developments in the spheres of science, industry and commerce. Heritage sites do not have the resources or expertise to drive base-level change in ICT. But the availability of ICT is the principal determinant of what can be achieved.
- *Cost of technology:* Global economic forces have acted to drive down the price of ICT hardware and software. This contextual factor affects both heritage sites and their visitors. Lower costs have made ICT technology more accessible to heritage sites which tend to be characterised by limited finances (the increasing use of touch-screens, large LCD screens and solid state audio guides at heritage sites is an obvious manifestation of this). Moreover, ICT has become a commodity item in society. As more consumers have to opportunity to have increasingly sophisticated ICT in their homes, more people are becoming familiar with technology. Furthermore, many visitors will have access to technology in their workplaces. Visitors are therefore becoming increasingly familiar with ICT and so the accessibility has increased. This accessibility and familiarity can also lead to increased acceptance of technology. The visiting public are driving demand. Although, there is still a ‘Digital Divide’ within many European countries, which increases with the newly joined nations.
- *The acceptance of technology:* The acceptance of technology is determined by socio-economic factors. The widespread use of ICT is the result of complex interactions between economic forces and user needs. Acceptance of such technology is often dictated by the penetration of ICTs in society (the internet, digital TV, mobile phones, PDAs). The level of acceptance of technology is relevant to both the site visitors and the site interpreters.
- *Reliance on cutting-edge technology solutions:* Some

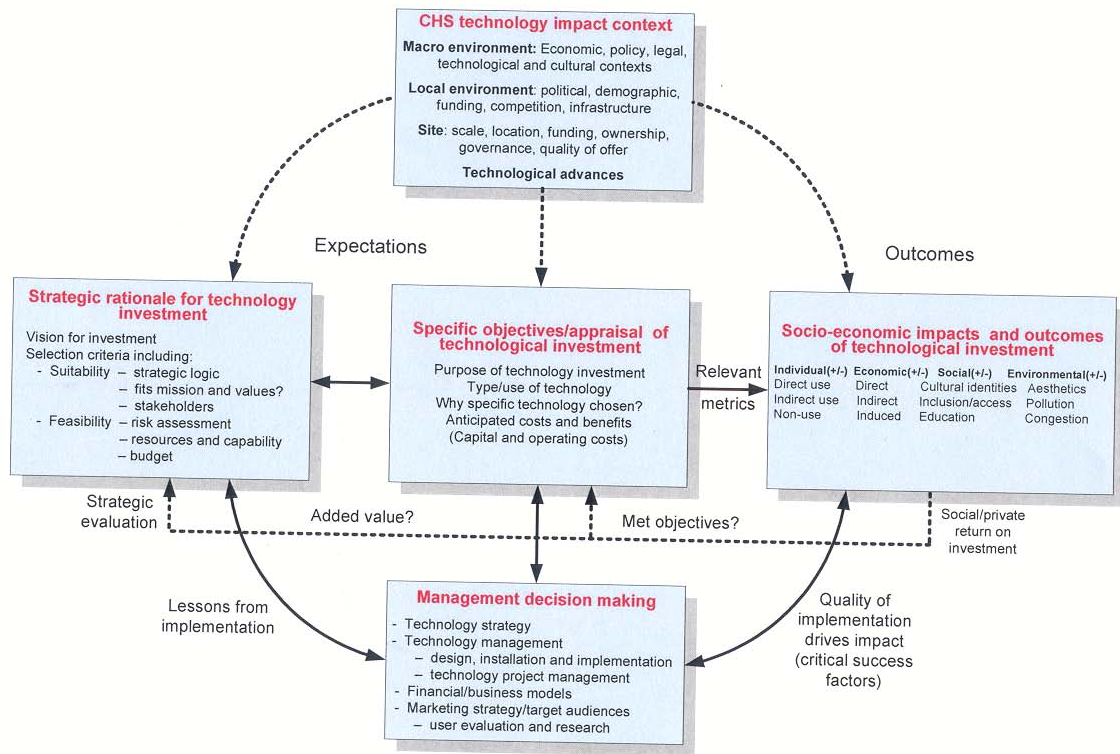


Figure 2: A holistic investment framework that allows heritage site managers to conceptualise how ICT deployment influences socio-economic impact

ICT technologies and standards are well-established (the Internet, PC hardware, HTML, XML, etc), but others are still in the process of gaining market acceptance. Heritage sites are not best placed to know which technologies and standards are likely to gain market acceptance, hence, why heritage has always been a late adopter of technology. Sites with potential ICT deployments that rely on cutting edge technologies/standards could run the risk of the technologies used failing to gain long-term market success, however, if successful these sites could have a market-leading advantage. Deploying technological solutions at the appropriate time is crucial.

3.1. Strategic rationale for technology investment

There has to be a strategic rationale for technology investment. This is usually closely linked to the mission and vision for the site. Strategy needs to underpin the

management decision making at a heritage site. Two principal components are suitability and feasibility:

3.2. Vision

All investment decisions usually involve some intended innovation to enhance the cultural product offer. The vision is eventually a strategic view of where the site should be and what it should offer. Once this is clearly defined the exploration of the appropriate ICT for the vision can take place.

3.3. Suitability

- *Strategic logic:* There must be a strategic logic for the deployment of ICT. At its simplest a heritage site’s strategy revolves around three questions: where is the site positioned now, where does it want to be positioned, and how will it achieve that goal. An ICT-based solution may, or may not, be the most effective use of resources for achieving that

goal. There have been many examples of technology-led solutions that have been deployed at heritage sites for no other reason than the technology was available.

- *Site mission*: Another key question is does the particular use of ICT fit with the mission and values of the site? It is crucial that the deployment fits the mission and values of the site. For example, the type of ICT deployed at a site whose primary aim is education might differ from one where visitor numbers are required to support the revenue stream.
- *Stakeholders*: All investments involve opportunity costs. The potential funds that may be devoted to an ICT project can alternative uses. It is therefore essential that stakeholders support the deployment of resources.

3.4. Feasibility

- *Risk assessment*: The installation of ICT can hold considerable risk for heritage sites. For many it is an area beyond their traditional sphere of experience so they are reliant upon external sources of consultancy and services. A typical risk factor is cost outweighing the benefits.
- *Budget*: Sites have to consider if they have the budget for ICT installation and maintenance and/or the resources and capability to support such an installation.
- *Resources and capability*: The introduction of ICT requires numerous new skills. Heritage sites need to establish what resources and capabilities they have for such a deployment. Do they have any skills in house or will the entire project (or part of the project) need to be outsourced? Furthermore, ICT requires maintenance. Hardware which requires a high level of manual interaction such as touchscreens, trackballs, and keyboards all require upkeep. Purely electronic hardware such as processors, motherboard batteries, disk drives, can all fail. Bespoke software may have bugs. Sites have to allow for these contingencies and set aside resources at the outset for maintenance.

3.5. Management decision making

The management decision-making element is another key component that influences impact. This encompasses three components; technology management, the financial and business models, and the marketing strategy.

3.6. Technology strategy

Cultural heritage sites should have a continuous review of technology strategy (e.g. Web, audio-guides,

booking systems, visualisation technology, etc) that can support the cultural offer.

3.7. Technology management

Technology management is a multi-faceted area:

- *Technology project management*: There are numerous considerations to be made when managing a technology project. For example does the project meet the vision. Is there a clear specification, as Soren [SOR05] notes “Clear objectives and values help curators take ownership of a project, and feel responsible for whether it succeeds or fails”. It is necessary to liaise with external partners and with internal players (i.e. using human resource management for managing change). Not all heritage sites have the luxury of having full-time staff devoted to ICT management. Some have to share IT staff between sites or have staff who do IT-related tasks in addition to other jobs. These sites may have to purchase these skills from outside consultants. If the heritage site is for some reason unable or unwilling to maintain their ICT deployment then its impact may change from a positive to a negative. Furthermore, deploying ICT at a heritage site is not the end of the story. Information technology, as with all technology requires maintenance. Many sites do not have the skills to keep ICT projects running if the technology breaks down. This of course then requires external consultancy to fix any problems but, needs to be factored into the running costs of the original business and sustainability model. The following factors are also integral with technology management:
 - *Management ‘buy-in’*: Much work has been conducted in the commercial business sector that shows that the lack of senior management buy-in is one of the biggest reasons for the failure of technology projects. This is extremely important in the cultural heritage sector because there can still be reticence towards the use of information technology in what is still a sector with traditional origins. Without management buy-in projects could fail before deployment or could have insufficient resources for successful deployment, leading to negative impressions by visitors.
 - *Leadership*: Closely related to the above is leadership. Leadership for an ICT deployment at a heritage site exists at two levels; the strategic leadership that drives the overall conceptualisation, and the IT project leadership that manages the actual day-to-day running of the project. Strong strategic and project leadership can greatly enhance its chances of success.
 - *Design, installation and implementation*: When visitors come face-to-face with front-of-house ICT at

heritage sites their first impression is a function of the design, implementation and installation of the technology. The design of ICT applications is a complex area that is usually beyond the experience of heritage site personnel because so many different skill-sets are required (ICT development, graphic design, ergonomics, etc). As heritage sites have become more likely to deploy ICT to enhance the visitor experience this has created a market opportunity for organisations who design and install ICT solutions (and those who co-ordinate the various project specialists). Although, even today few enterprises can rely solely on the heritage sector for their business. Still heritage sites deploying ICT are now making a contribution to the business sector.

- *The quality of the implementation drives the potential impacts:* An exceptional use of technology can be let down by poor design, location, and implementation. Alternatively, lack of funding may result in poor design because shortcuts were made. This is important because considerable evidence points to cultural tourists as being increasingly sophisticated visitors. This does not imply that all visitors to heritage sites are classified as cultural tourists, but there is a tendency for museum and heritage site visitors to come from higher education backgrounds.

3.8. Financial and business models

In the past many heritage sites have been caught out by the lack of coherent, sustainable business models. Capital funds and grants have been devoted to projects but less consideration has been devoted to the sustainability of the project. There is evidence that this is slowly beginning to change many funding bodies now require evidence of sustainability and business planning before they grant capital funds to projects. In the UK funders such as the Heritage Lottery Fund and English Heritage now require sustainability plans for the projects they fund. There are numerous considerations for financial and business models, such as charging for specific exhibitions, developing exhibitions with the potential to tour and so gain extra revenue, or more imaginative models such as sharing development costs in return for a percentage of the revenue.

3.9. Marketing strategy and target audiences

- *Marketing strategy:* ICT deployments do not exist outside of a business system. If visitors are not motivated to go to the physical or virtual heritage site in the first place then the impact of the ICT deployments can be reduced. A significant investment

in ICT might form the basis of a marketing campaign. At the British Museum the special exhibition the ‘Mummy: the inside story’ was accompanied by a strategic marketing campaign. This certainly increased the awareness and therefore had a considerable influence on the visitor numbers and so the scale of the impacts and outcomes.

- *User evaluation and research:* heritage sites have a long tradition of conducting research on their visitors to determine user satisfaction. Visitor surveys or interviews are and well understood by heritage sites. There is also considerable external consultancy available to sites (although, to date very few sites have targeted the incremental contribution to the user/visitor experience caused by the use of ICT). There is therefore a well-established mechanism that heritage sites can use to determine the socio-economic impact of technology at heritage sites. Furthermore, user evaluation can be used to support marketing research.

3.10. Specific objectives and appraisal of the technology investment

The purpose of technology investment is often key for understanding the impact of ICT. ICT investment reflects cultural product innovation and can provide a basis for a new offer. There can be a wide range of reasons for the deployment of visitor-facing ICT at heritage sites. These can include: enhancing the users experience, increasing visitor numbers, increasing accessibility, enhancing educational impact, or some combination of the above.

A key question that sites often want answered is “has the investment achieved this aim?” The objectives of a project are key to determining what impacts should be assessed.

- *Type/use of technology:* The purpose for a technology investment is a key determinant for why a specific technology is chosen. This of course is tempered by the anticipated costs and benefits of such a deployment. The type of technology chosen is key for impact assessment. Different technologies have different potential for impacts and outcomes. Technology that is connected to the internet may have a greater impact because of the potential for access to a larger number of people. Visualisations at heritage sites may have a considerable impact to the visitors, but this may not be translated to a broader impact because of the localised nature of the impact.
- *Anticipated costs and benefits:* This is the essence of appraisal. The initial capital cost outlay can be estimated as can the potential social returns and benefits. The anticipated costs may be assessed through the use of Return on investment (ROI), and Net

Present Value (NPV) calculations. It is essential to consider both the capital and operating costs for a deployment. These assessments can then be compared to the potential anticipated benefits that the use of ICT may entail. Once a project is running the impact measures can be used to provide data on the actual return.

4. Socio-economic impact of technology investment

In this model the measurement of socio-economic impacts is not just something that is necessary to fulfil funding obligations, but is an essential part of the management decision-making process of a heritage site. The measurement of impacts is key to validating the heritage site strategy. Socio-economic impact embraces many possible impact dimensions (e.g. economic, individual, social, environmental, etc). Within each of these dimensions there are a number of possible methodologies which can be employed to identify and measure impact, each method having advantages and disadvantages [MSK06].

5. Conclusions

The above models highlight the limitations of assuming a simplistic relationship between deploying technology and its impact. It is apparent that a multiplicity of factors influence social and economic impact simultaneously with any technology impacts. Deploying ICT is therefore no guarantee of achieving the goals of a site or improving the deficiencies of a site. However, if there is a strategic rationale for technology investment then there is greater potential for positive impacts and outcomes. The break down of the model into elements allows users to conceptualise the process of investment. This way of thinking could be called 'heritage systems analysis'. This is to say a consistent theoretical model for heritage sites that allows the internal and external factors that influence impact to be conceptualised. If the heritage sector were to understand how various components of the system are inter-linked and affect impacts and outcomes then this could become the basis for understanding impact. In this context understanding impact becomes the basis for positively influencing impact. The underlying strength of this model is its versatility. Although the model is oriented towards the investment in, and deployment of, ICT at heritage sites it could be modified for many investment decisions.

6. Acknowledgements

EPOCH's socio-economic impact research has been supported by the European Commission's Framework 6 programme (IST-2002-507382).

References

- [MR04] MIGNOSA A., RIZZO R.: Heritage and information. In *Interdisciplinarity or the best of both worlds – the grand challenge for cultural heritage informatics in the 21st century, Selected papers from VAST 2004* (2004).
- [MSK06] MCLOUGHLIN J., SODAGAR B., KAMINSKI J.: Dynamic socio-economic impact: a holistic analytical framework for cultural heritage sites. In *Heritage Impact 2005: Proceedings of the first international symposium on the socio-economic impact of cultural heritage* (Budapest, 2006), Archaeolingua, pp. 43–57.
- [SOR05] SOREN B. J.: Best practices in creating quality online experiences for museum users. *Museum management and curatorship* 20, 131-148 20 (2005), 131–148.