Embedding sustainability dimensions in university collections management: a "scientific journey" into a natural history museum

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Michela Magliacani and Daniela Sorrentino
Department of Economics and Management, University of Pavia, Pavia, Italy

Abstract

Purpose – The purpose of this research aims at extending the knowledge on whether and how universities include sustainability dimensions in managing their collections. Precisely, the study focusses on the creation of a university museum (UM), as an embryonic stage of life during which management concerns both strategic and operational issues.

Design/methodology/approach – Sustainability is envisioned as a multifaceted concept, composed of the economic, cultural, environmental and social dimensions. Resorting to an acknowledged theoretical model for sustainable development in museum management, a qualitative interpretative study is carried out, gathering data from multiple sources. The empirical setting is the University of Pavia, which has recently created a new Museum of Natural History (Kosmos).

Findings – Results highlight how sustainability dimensions intertwin in UM creation. Moreover, the economic dimension emerges as a basement for the others. Value for the community, expressed in economic terms, must be ensured in UMs creation as well as throughout its entire life, in order to support cultural, environmental and social sustainability.

Research limitations/implications – Focussing on the embryonic stage of UMs life allowed to consider how sustainability is embedded in relevant strategic and operational decisions. Nevertheless, scholars are encouraged to replicate the study in other stages of UMs' life, in a way to provide insights on its dynamics.

Practical implications – University collections managers can benefit from this research by acknowledging the role played by the economic dimension of sustainability. Notwithstanding their mission, universities should pay attention to extracting economic value from the management of their collections, as a means to ensure innovative and sustainable management on the cultural, environmental and social respects. Furthermore, this research suggests how a higher education system is able to create a new museum by relying on interdisciplinary competencies, which support sustainability since the embryonic stage.

Originality/value – This research contributes to the cultural heritage management literature by proposing an updated version of the sustainable development model for museums, which highlights the different relevance of the sustainability dimensions with particular regard to the UM creation and management.

Keywords University heritage management, Cultural heritage sustainable management, University museum, Sustainability, Museums creation, Monumental building regeneration, Kosmos, Economic revitalization

Paper type Research paper

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Introduction

Welcomed by the international community, the concept of sustainable development has gained such a relevance to become a key issue in the definition of the UN 2030 Agenda. In this perspective, organizations performance is increasingly assessed on the ground of their sustainable impact (Lamberton, 2005; Xiong and Mok, 2020).

These concerns have also regarded the cultural heritage management since the first acknowledged definition of sustainable development reported by the World Commission on Environment and Development (Brundtland and Khalid, 1987). The latter has been also adopted within cultural heritage, in relation to the capability to generate tangible and intangible benefits from the usage of cultural goods for both individuals and society (Throsby, 2017). That capability is referred to the "Cultural heritage sustainable management" mainstream, within which this study has developed. A further stimulus comes from the strategic recommendations of the EU and the Council of Europe, which promoted a sustainable use of cultural heritage, also regarding the allocation of public funds.

A useful contribution to this field has been added by the Madan's book (2011), "Sustainable museums: strategies for the 21st century", which provides empirical evidence on the relationships between sustainability and organizational changes, leadership, planning, impact assessment. Consistently, the author stresses the relevance to make sustainability pervasive in any managerial and organizational aspect, from the mission statement to strategies and operations. According to Worts (2011, p. 411), this contribution reinforces the awareness of museums as cultural organizations and opens up new investigation on their potential to become facilitators of the "culture of sustainability". On this basis, recent studies have added new insights on research methods and patterns of museums sustainable development, though requiring further research to ground their findings (Stylianou-Lambert *et al.*, 2014; Pencarelli *et al.*, 2017; Orea-Giner *et al.*, 2019). This call concerns the management of all types of museums, including the university collections, hitherto under-investigated (Laredo, 2007; Mozzoni *et al.*, 2018). The focus is chosen considering the relevant collections managed by universities in the world – such as the Oxford Museum of Natural History, the Cambridge Museum of Zoology, as well as the Groningen and Bergen University Museums – and their impact on the sustainable development of the academic community and the urban environment.

Addressing this research gap, the study aims at exploring how universities attempt to include sustainability dimensions in managing their cultural heritage. To this aim, the research resorts to the theoretical model on museums sustainable development by Stylianou-Lambert *et al.* (2014), as a managerial tool that can be adapted to investigate university museum (UM) sustainable management. The study stems on a qualitative interpretative approach (Van Thiel, 2014), gathering data from multiple sources. The research context is the University of Pavia (Lombardy, Northern Italy), with particular regard to Kosmos, a newly created Museum of Natural History. This study is outlined as follows. Firstly, the critical literature review on sustainable issues in museums management is carried out. The following section describes the theoretical framework guiding the investigation. Then the methodological approach and the data sources used for the research are explained. The findings achieved by the triangulation of methods (documental analysis, ethnographic observations and interviews) are presented and discussed. The final remarks, with the limits of the research and further developments, are underlined in the concluding section.

Literature review

Inhabiting the worldwide economic and political debate since the 1970s, the concept of sustainability has experienced a gradual refinement through the time (Lafferty and Langhelle, 1999). Since the beginning, sustainability has been intertwined to the concept of development, hence promoting the principle of a development path that should "meet the needs of the present without compromising the ability of future generations to meet their own

needs" (Brundtland and Khalid, 1987, p. 43). Moreover, in its former conceptualization, sustainable development predominantly focussed on environmental issues, that is on the theme of ecological degradation within the economic activities.

During the following decades, the growing attention from the international communities has favoured a progressive enlargement of the concept, which today also encompasses the social and cultural dimensions of sustainability (Kadekodi, 1992). As for the former, it refers to the maintenance of political and community values, as well as to the satisfaction of basic human needs and the equity of resources distribution within the society. Cultural sustainability, instead, relates to the conservation, maintenance and preservation of cultural goods in their different forms, that are arts, heritage, knowledge and cultural diversity (Soini and Birkeland, 2014; Soini and Dessein, 2016). Hence, sustainable development can be envisioned today as a multifaceted concept, built up of four pillars (Nurse, 2006; Connely, 2007). The UN 2030 Agenda itself embeds such holistic conceptualization of sustainability, whereby it promotes an action plan based on 17 SDGs that cut across the multiple dimensions of sustainable development (Burford *et al.*, 2013).

Scholars in the field of cultural heritage management have increasingly welcomed the opportunities to address sustainable development issues into their research, in a way to create a new literature debate on their relationships (Roders and van Oers, 2011). In this respect, museums have been addressed as specific institutions, the activities of which can have an impact in terms of sustainable development (Davies and Wilkinson, 2008; Madan, 2011; Shehata *et al.*, 2017). Cultural heritage literature has been calling for new managerial approaches in order to enable cultural organizations such as museums to face the financial challenge due to the persistent state of austerity (Pencarelli *et al.*, 2017). Hitherto, the lack of dialogue between culture and management has led to neglect crucial issues of value creation processes within the sector (Zan *et al.*, 2015), such as sustainability in its economic social, cultural and environmental dimensions (Stylianou-Lambert *et al.*, 2014; Loach *et al.*, 2017).

The research stimulus also comes from the European Union financial programme, such as *Creative Europe* (https://eacea.ec.europa.eu/creative-europe/) as well as the Council of Europe with the *Framework Convention on the Value of Cultural Heritage for Society* (Faro, 27.X.2005), which encourages the sustainable use for cultural heritage. Moreover, the EU dossier, *Cultural Heritage counts for Europe* (2015), provides strategic recommendations for "*the positive contribution of heritage to regional and local sustainable development–as a strategic resource for « smart, sustainable and inclusive growth» and as a basis for fostering inclusive, innovative and reflective societies – in the context of the mid-term review of the Structural Funds (in 2016–2017) and the preparation for the next generation of Structural Funds beyond 2020*".

UMs hold a relevant place in this respect. On the one hand, as higher education organizations, they are increasingly called to integrate sustainability into their missions, strategies and operations (Portney, 2005; Xiong and Ka, 2020). On the other hand, as they operate as cultural organizations within the scope of universities, the way they embed sustainability into their management contributes to the overall performance of universities. Nevertheless, not only how policy recommendations are embedded in cultural organizations' practices is scantly investigated (Eppich and Grinda, 2019) but there is also a lack of evidence on UMs management under sustainability perspective (Mozzoni *et al.*, 2018).

Theoretical framework

In order to address the mentioned research gaps, this study resorts to Stylianou-Lambert *et al.* (2014), who propose a theoretical model of the museums sustainable development (Figure 1). The latter describes the role museums can play in terms of sustainable development in the cultural policy field. Precisely, the model is composed of four intersecting dimensions – cultural, social, environmental, economic ones – which contain parameters to be considered when drafting cultural policies for the sustainable development of museums. The dimensions have

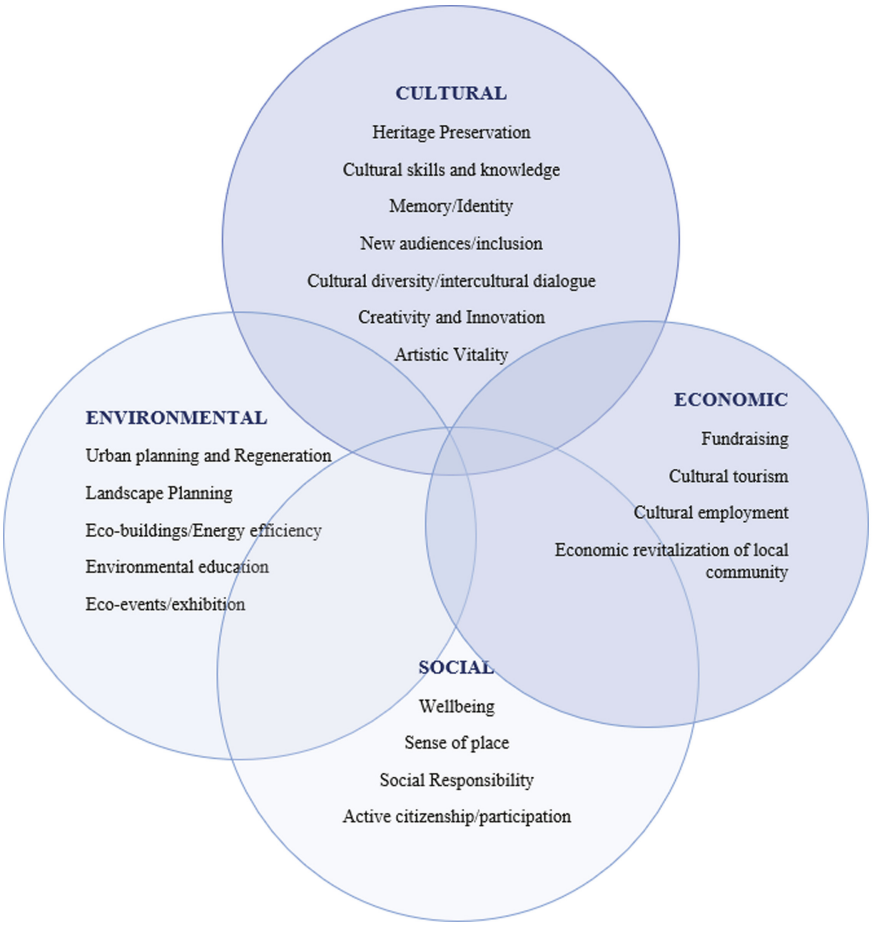

Figure 1.
Theoretical model for the sustainable development of museums

Source(s): Adapted from Stylianou-Lambert *et al*., 2014, p. 570

been intersected acknowledging their unavoidable interdependencies, as some parameters overlap amongst them. As for the cultural dimension, the model considers the cultural preservation, skills and knowledge as relevant parameters that determine how future generations will form their national and local identities. Further parameters refer to the promotion that museums should make of cultural diversity and vitality, that is of cultural creativity and innovation. At the intersect between the social and cultural dimensions, there is the theme of inclusiveness, with this referring to the need to encourage the involvement of new audiences. Moving to the social dimension of the model, museums are deemed to play a role for the overall well-being of local communities, and thus for the creation of a sense of place. In this respect, museums should adopt socially responsible behaviour aimed at encouraging the involvement of communities' members. As for the environmental dimension, it refers to the impact of museums in regenerating and planning urban areas and landscapes. Additional parameters are the preservation of the environment through eco-buildings and energy efficient practices, as well as the environmental education that museums can provide through exhibition

and eco-events. Finally, as for the economic dimension, key parameters are represented by fund raising, the development and promotion of cultural tourism and job creation, and thus the revitalization of the local community.

Though the model has been designed as a guide for cultural policymakers, it can applied as a managerial tool for museums. Accordingly, this model allows to adopt a holistic conception of sustainability to explore how universities museums embed these principles into their management (Mozzoni *et al.*, 2018; Orea-Giner *et al.*, 2019). Given the relevance of making sustainability pervasive in any managerial and organizational aspect (Madan, 2011), this study focusses on a UM stage of life where management is concerned with both strategic and operational issues. Specifically, the focus is on the creation of a UM, as an embryonic stage of its life. From this reasoning, a research question comes out:

How do Universities embed sustainability in managing the creation of a UM?

Research design and methods

Aiming at exploring whether and how UMs embed sustainability development issues into their management, this research stems on a qualitative interpretative approach (Van Thiel, 2014; Yin, 2017). The empirical setting is provided by the University of Pavia, in Northern Italy, which has recently created Kosmos, a new Museum of natural history.

This choice grounds on two main reasons. First, Kosmos has been only recently launched (six months before the time of writing), so that it allows to focus on a UM embryonic stage of life, during which decisive strategic and operational decisions are made. Second, pursuant the Italian higher education reform (the so-called "Gelmini Law", n° 240/2010), Universities' collections management has been included as a parameter for assessing the related overall performance. This reform led the universities to pay more attention to the cultural assets and their accessibility, which underpins managerial competences based on sustainability in its plural dimensions. Investigations on the Italian higher education system have described their cultural goods and their managerial models clustered in: department collections, university museums and University Museum System – UMS. The former collections are mainly used as matter for department laboratory (as anatomic items for teaching and research). UMs have, instead, an institutional identity recognized by the cultural heritage regional regulation, but they are financially dependent on the university budget. The system of UMs and collections represents the more complex managerial model which is co-ordinated by an "umbrella entity", which could manage a separated budget or depends on the central budget (the university funds) (Mozzoni *et al.*, 2018).

In order to overcome the shortcomings typically attributed to interpretative studies (Morgan and Smirchich, 1980), multiple data sources have been used. First, the research was carried out through documentary sources on the history of the secular building where the UM was set up ("Palazzo Botta") and on the Regulation of the UMS of the University of Pavia. While the former contains relevant descriptions on the project through which Kosmos has been planned, the latter allows to identify the governance of the UMS and the subjects involved in the strategic and operational management of Kosmos. Indeed, the key subjects involved in governing Kosmos are the decision-makers who may have considered sustainability issues in the museum creation. The ethnographic approach represented a second source of data gathering (Dey, 2002; Spradley, 1979). The membership to the University of Pavia enabled one of the authors to attend, as a field observer, to the project teams' meetings held for drawing up the strategic plan. As such, ethnography was considered suitable for gaining fresh insights on whether and which dimensions of sustainability were embedded in the embryonic stage of the museum creation. Moreover, a third source of data gathering was represented by semi-structured interviews addressed to nine key subjects involved in the strategic and operational management of Kosmos (Table 1).

Interviews code	Subjects	Topics	Aims of the interviews
I1	Project Manager	Economic and environmental sustainability issues in the development of the Kosmos project	(1) Role of the subjects in the museum creation (2) The motivation behind the UM creation (3) The UM desired impact (4) Their perception about the sustainability dimensions embedded in the UM creation (5) The relevance of the sustainability in the UM creation
I2	Ex University Dean	Drivers of Kosmos creation and its impact in terms of University Third Mission	
I3	UMS President	Drivers of Kosmos creation under all sustainability perspectives	
I4	UMS Secretary	Economic sustainability issues underpinning the Kosmos creation	
I5	Curator of the Paleontology section	Cultural sustainability issues underpinning the Kosmos creation	
I6	Curator of the Zoology section		
I7	Curator of the Comparative Anatomy section		
I8	Kosmos external provider	Social sustainability issues underpinning the Kosmos creation	
I9	UMS Communication Officer	Social, economic and cultural issues underpinning the Kosmos creation	

Table 1.
Summary of the interviews

The ethnographic approach has allowed to identify key actors engaged in the UM creation project. Each interviewee had played a relevant role with regard to one of the sustainable dimensions considered in the theoretical framework. Given the role played by each interviewee and the multidimensional conceptualization of sustainable development adopted in this paper, questions on decisions and desired impacts were investigated with reference to the cultural, economic, environmental and social dimensions (Stylianou-Lambert *et al.*, 2014). Precisely, questions have been customized to each interviewee, to take into account their experience in the project with regard to a specific sustainable dimension. Each interview, carried out individually, were administered following a precise protocol of unstructured questions in order to allow interviewees to argue on each topic broadly and freely. Questions were formulated in a way to avoid any risk of shaping the answers to the research objectives (Krippendorf, 2004). Main insights from each interview are reported in the related results section, as a support to the explanation and interpretation of the case.

Interviews were recorded and literally transcribed. The method adopted to analyse interviews data relied on a text analysis. The latter deals with the decomposition of a document into words and can be carried out at different degrees of depth and complexity, according to the research needs (Turney, 2002). For the purpose of this paper, interviews transcriptions – that are the units of analysis – were subjected to a cyclical reading in order to extract the content associated to each sustainable dimension of the framework. The analytical method adopted has not focussed on the meaning of each words, but rather on inferring the concept conveyed by the text with reference to each sustainable dimension of the theoretical framework described above. Afterwards, the evidence was grouped in an interview report, which disclosed the main insights gathered from different interviewees on

each dimension. The multiplicity of data sources, as well as the joint commitment of the authors to all phases of data analysis allowed triangulation, thus strengthening the empirical evidence of the research (Lune and Berg, 2016).

Results

Results from documental sources and ethnographic observations

Kosmos is the result of a recovery, restoration and restructuring project regarding the first lot of Botta Palace, considered the most beautiful patrician residence in Pavia (Tolomelli, 2007). The palace was built at the beginning of the 18th century by the Marquis Luigi Botta and as early as 1705 it welcomed and hosted many famous characters, such as Napoleon Bonaparte, Francis I of Austria, Archduke Ferdinand of Habsburg, Marshal Joseph Radetzky and Vittorio Emanuele II of Savoy.

After the death of Clementina Botta, the last descendant of the family, the palace was purchased (deed dated on 8 May 1887) by the University by the 1886 law on the new structure of scientific institutes (Vidari, 1911). The University of Pavia initially established the headquarters of the Faculty of Mathematics, Physics and Natural Sciences (now in another place of Pavia) in the Palace and decided to use that place for educational and later museum purposes.

The need to adequately maintain and restore the first lot of the building has led to a reflection of the University's governance for managing its museum collections, which tell the centuries-old history of its illustrious scientists and their discoveries in the various fields of knowledge. In addition, the new Ministerial regulation, in terms of the Third Mission, has decisively contributed to making these collections more accessible by the local community and other stakeholders. In 2016, the University proposed the project "The Spallanzani Museum of Pavia" to the Cariplo Banking Foundation (CBF), answering to the funding call for emblematic cultural interventions. This project aimed at recovering the Botta Palace in order to re-use the latter as the location of the new museum dedicated to the great scientist who gathered and edited the first Natural History Museum of the University in 1775. The latter was created for educational purposes, thanks to the efforts of Lazzaro Spallanzani, Professor of Natural History at the University of Pavia, who received the gift of a nucleus of minerals by the empress Maria Teresa of Austria (Mazzarello, 2004). The zoological collections, many of which have a high historical and scientific value – such as the Nile crocodile (*Crocodylus niloticus*), the hippopotamus (*Hippopotamus amphibius*), the short-finned mako shark (*Isurus oxyrhynchus*), the bottlenose dolphin (*Tursiops truncatus*) and the taxidermized elephant "Shanti" that Napoleon Bonaparte donated to the University of Pavia in 1804 – made necessary to have a larger space to ensure their conservation and exploitation (Plate 2).

Thanks to the contribution of the CBF, the project was carried out during the three-year period foreseen by the fund call. The birth of a new museum that would have housed the rich collection of natural history of the University of Pavia represented an objective of the 2013–2019 strategic plan of that governance.

The CBF 2013–2018 Call aimed at financing, on a competitive basis, emblematic projects concerning structural investments in the Lombardy region. It was an opportunity to carry out the large restoration project of the Botta Palace for creating the Museum of Natural History. The call required the following prerequisite:

> The project must be carried out on the territory of the province in favor of which the allocation was made and must have significant dimensions, suitable for generating a positive and high impact on the promotion of cultural, scientific, environmental, educational, economic and social development of the local community (CBF Guideline July 2013, 3).

The University of Pavia responded to this call with a Museum Plan that was drawn up by an interdisciplinary research team led by the Dean's delegate to the architectural heritage, Professor of Civil Engineering and Architecture. The technical analysis of the palace has been

done by a Professor in Architecture and her staff, the contents of the museum have been formulated by the President of the UMS and the Director of the natural history collections, while the financial budget has been elaborated by a research team made up by academics with economic and financial expertise. The project was shared by the whole team and the University governance, because it would have been co-financed in case of obtaining funds from the CBF.

The ethnographic observation of the research team meetings has been critical for following all the steps of the embryonic stage of the new museum life. First of all, the museum idea, supported by the SWOT analysis (i.e. an analysis of Strenghts, Weaknesses, Opportunities and Threaths), has been formulated in the following mission statement:

> A historic building that becomes usable and accessible for the Community, having the opportunity to fully express its historical, cultural and architectural value (team meeting on April 6th 2016).

A further relevant result is stressed by the following quotation:

> The challenge of the new Museum is to be able to create and spread cultural and social value, managing the collections according to the criteria of economic rationality. This implies to combine the principle of sociality with the criterion of "3Es" (Efficiency, Effectiveness, Economy). An effective and efficient management of the Museum collections will require a greater attention to users' need, as well as to monitor the costs of conservation and enhancement of the collections, according to the sustainability principle of intra-intergenerational equity (team meeting on April 29th 2016).

The Museum Plan has been sent to the CBF on 26 May 2016 and has been successfully financed.

Kosmos, the Museum of Natural History of the University of Pavia, was launched on 21 September 2019 (Plate 1).

The Museum is managed by the UMS, which also includes four other museums (Museum of Electrical Technology, Museum for the History of the University, Golgi Museum and Museum of Archeology) in addition to the botanical garden and other departmental collections (anatomy, mathematics, mineralogy, physiology, musicology). The UMS was established in January 2005 in order to support museum structures in carrying out their institutional mission (i.e. scientific research, promotion, conservation, restoration, cataloguing and display of exhibits, documents and memorabilia) (Art. 1, UMS Regulation).

From an organizational perspective, the UMS is configured as an "umbrella entity", because the annual budget is authorized by the Board of Directors of the University of Pavia on the proposal of the President and in accordance with the manager of the cultural heritage area. The directors of each museum and the managers for the department collections are in charge of the cultural programme and the relative budget (Art. 12, UMS Regulation). All proposals, both cultural and financial, are submitted to the Technical Scientific Committee composed of the President, the directors/managers of the collections, the manager of the Cultural Heritage Area and the administrative secretary of the museum system (Art. 8, UMS Regulation).

On a daily basis, curators collect and communicate information on the number of visitors (paying and non-paying) to the manager of cultural heritage area. Moreover, the UMS reports yearly on its whole performances, achieved by each museum, through a public event.

According to the UMS Regulation, Kosmos is managed by the Director, who is Professor of History of Medicine at the University of Pavia. The staff is composed of three curators in charge of each section in which the collections are clustered (zoology, paleontology and comparative anatomy) and the communication officer. They are part of the pre-existing University personnel and their performance has to be accountable towards the Manager of Cultural Heritage Area (Figure 2). The museum has outsourced the ticketing and gadget services, as well as the edutainment and guided tours arrangement. The key subjects, engaged in the management of the embryonic stage of Kosmos life (Table 1), have been derived from the documental analysis described in this section.

Source(s): Kosmos digital archive

Plate 1.
The main entrance of Kosmos Museum of Natural History of the University of Pavia

Results from interviews

Interviews to key subjects enriched the understanding of the evidence by providing deeper insights on the ways and the reasons behind the museum idea has been gradually shaped to become what is Kosmos today. Firstly, the reconversion of the Botta Palace has been attempted to regenerate a monumental building and to use it for a public function. As the project manager highlights (I1):

> The usage of part of the Palace for that purpose represents a clear instance of functional reconversion of an historical and architectural heritage of relevance for the city of Pavia.

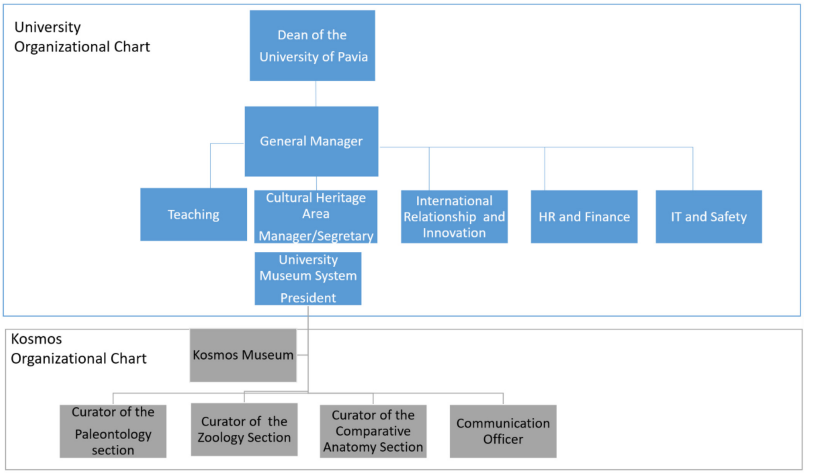

Figure 2.
The Kosmos Museum organizational structure

Source(s): Our adaptation from the UMS Regulation

Moreover, the public relevance of the museum within the UMS was committed by Ex University Dean, who declared that (I2):

> Though private organizations do have an impact on the society, there are some choices entrusted to the public spheres: the preservation of the Botta Palace – as a relevant cultural heritage – together with the recovery of the Spallanzani collections are both of that kind .

At the same time, on the belief that the public sector should move away from the view of sloppy and modest services, the Ex Dean encouraged an innovative exhibition idea to bring the Spallanzani collections to the light again. As such, the UMS President regained the concept of the "scientific journey". This idea pioneered by Lazzaro Spallanzani himself, had already been at the heart of a former contribution by the President. This concept, as the very narratological code of the museum, entailed a significant reshaping of the project. Accordingly, the exhibition is no longer dedicated exclusively to Spallanzani, but rather it welcomes other great naturalists of inspiration – such as Humboldt, Darwin, Cuvier and Linnaeus – in a way to tell the history of contemporary biology, starting from the past and extending to the future. In the President's words:

> Collections are no longer exhibited following the criteria traditionally adopted in natural science museums (e.g. the specie criteria), but rather by using the enormous Spallanzani collections as if they were words of a lexicon that allows to explain the concept of the scientific journey (I3).

The adoption of the name Kosmos – instead of the original "Spallanzani Museum" – owes this narratological concept.

In the scope of this concept, the operational implementation of the project focussed on developing proposals that could be of interest for different societal groups. To this aim, the UMS Secretary explains that all Kosmos services were initially appraised and categorized as primary and secondary. Then, given the University budget available and the internal competencies, the educational activities and the management of guided tours have been outsourced. This has allowed to establish a system through which the costs borne by Kosmos, as a UM, are covered through the tickets proceeds and the royalties (I4).

To this regard, the Ex University Dean remarks how it is essential for any organization to appreciate its value for the society, as well as what it is able to give it back:

> Kosmos must be managed in a way to provide value for the society, without generating losses. As this is often expressed in economic terms, Kosmos attempts to legitimately extract economic value from what it does (such as by selling gadgets or promoting exhibitions) (I2).

All this obviously entails the creation of new job positions and the activation of an economic system linked to the arrival and circulation of new people in the city.

Moving to the operational activities, the interior and exhibition design have been leaded by the project manager, who has attempted to combine original ideas with the inspirations from extant experiences of building regeneration. In this respect, the interviewee explains that:

> The main objective has been to implement eco-sustainable solutions without nevertheless sacrificing the preservation of the historical value of the building (I1).

From the interviews to curators and the external provider, some insights on the cultural programme came out. Firstly, curators stress that Kosmos exhibition itinerary pretends to satisfy different types of audiences, such as students, families, schoolchildren, enthusiasts and curious, without neglecting experts and researchers. Educational services precisely address schoolchildren and families, by proposing experiences that blend educational and recreational aspects (I5, I6, I7). The external provider points out that proposals for schools are deemed to promote a dialogue with them. As for the families, initiatives have been designed in a way to favour the creation of the museum as a meeting space in the city, by providing subscriptions and an intense schedule of events and exhibition during weekends (I8). In this respect, the external provider adds that:

> A key recreational and interactive aspect is represented by the opportunity, for children, to experience the collections by their touch: using a small elephant – symbol of the Museum in connection to its highlight, the Napoleone's elephant – children can open drawers on the rooms panels and enrich their sensorial experience at Kosmos (I8).

Furthermore, the visit is free of charge for students of the University of Pavia, thus gathering students enrolled in all degrees. Lastly, scholars are provided access to the collections – also to the part that is not currently exhibited but stored in the basement – thus enjoying of valuable sources for their research (I5, I6, I7). In fact, curators share the following perspective:

> Kosmos has launched a new concept of museum, that is a place for everybody, for families, students, and curious visitors. Kosmos represents a place where people enjoy leisure time by exploring the University collections, which is no longer hidden but rather available for everybody (I5, I6, I7).

Though desired impacts are touched upon by all the interviewees, the Kosmos communication officer summarizes them in the following. First, Kosmos is deemed to produce positive impacts in terms of a cultural proposal of a high scientific and educational level that brings lifeblood to the "cultural system" of the entire community. Second, Kosmos impact may be appreciated also at the "aesthetic" level, given the features of its exhibition solution. Third, Kosmos attempts to become a cultural hub for the city, which visitors can experience not just once in the time. Finally, Kosmos has already produced an economic impact on the community, by creating new job positions and an economic system triggered by the cultural tourism (I9).

Discussion

This research has shed light on how sustainability is embedded in the UM management at the embryonic stage of its life. From the UM project, the interdisciplinary research team has adopted the sustainable development model by Stylianou-Lambert *et al.* (2014). Although the study highlights how all four dimensions of sustainability have been embedded in the management of the museum creation process, the economic one appears to support all the others. The participation to a call for obtaining public funds can certainly trigger sustainability, thing that is not taken for granted within the cultural heritage sector (Zan *et al.*, 2015).

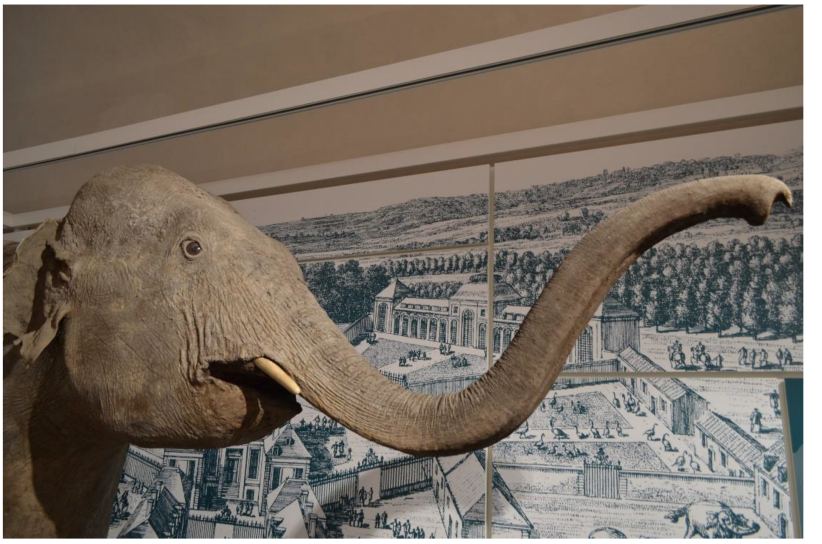

Plate 2.
"Shanti": the gift of Napoleon to the University of Pavia

Source(s): Kosmos digital archive

The interviews have reinforced, in fact, the findings of the documental sources and the ethnographic observations, by emphasising that the economic sustainability has represented the prerequisite for designing and planning the other dimensions.

If the cultural, environmental and social motivation had not been justified by the economic performances that allow to release value for the community, the project would not have been successful. The reconstruction of an idiosyncratic value for Pavia and its University – "Botta Palace" and the Spallanzani collections – for which funding was requested is configured as a driver of cultural sustainability. Consistently, the innovative label and highlight of this UM contribute to create an emblematic cultural heritage for the city.

At the architectural level, the regeneration project has been designed in line with the aims to combine preservation and the creation of a new museum as a cultural hub for the community. This project has implied the implementation of eco-sustainability choices in the integration of conservation and development initiative (van Oers and Pereira Roders, 2012). Hence, the environmental sustainability has been adopted in the embryonic phase of the UM creation, as well as the social dimension of the model. More specifically, the interviewees have underlined how Kosmos aims at building a relationship with the community in order to provide cultural services and meanwhile to disseminate the scientific knowledge represented by the natural history collections of the University. Citizens' engagement is a driver of the social sustainability that the UM has been attempting to develop. This result adds to previous literature, according to which local stakeholders' involvement is deemed to play a pivotal role for the management of cultural heritage for the community (Moreno-Mendoza *et al.*, 2018). This dimension is critical for a twofold motivation. First, it enables to build social trust within the community. Second, it allows to develop public engagement, which is assessed by the Agency of the Ministry of Education and Research (Mozzoni *et al.*, 2018). As for the expected impacts, Kosmos attempts to help people understanding the heritage, to provide a public space for discussion on social issues and to guarantee the memory of the past. These results are in line with the cultural heritage management literature, which asserts how museums are able to build and enhance social capital (Murzyin-Kupisz and Dzialek, 2013).

Figure 3.
The sustainability model of museum creation process

Given the economic sustainability prerequisite, the cultural dimension that initially motivated the project is the first step of a ladder that leads to designing the environmental and then social ones (Figure 3). The latter will allow museums to play an important role, as a community cultural hub, for the city and the university.

Nevertheless, the basement of the sustainability model previously described must be granted throughout the UMs life. In order to support the other steps of the ladder (cultural sustainability, environmental sustainability and social sustainability), UMs must create economic value, such as by extracting it from the museum activities and triggering the economic revitalization of the local community through cultural tourism (Moreno-Mendoza *et al.*, 2019; Orea-Giner *et al.*, 2019).

Conclusion

This study has proposed several contributions concerning the UMs management literature. First, this research has filled knowledge gaps on how UMs management can embed sustainability dimensions and contribute to the overall university performance in terms of public engagement within the Third Mission. Second, building on the theoretical model by Stylianou-Lambert *et al.* (2014), this research has provided an example of how the latter can be adapted as a managerial tool for museums. From this adaptation, a third contribution arises by providing an updated version that accounts for the different relevance of the sustainability dimensions with regards to the UMs management. Multiple case studies are encouraged to strengthen the reliability of the proposed sustainability model of museum creation process. Finally, results emphasise the importance for universities to rely on interdisciplinary competencies for embedding sustainability in the management of a UM since its embryonic stage of life. This latter contribution deserves more attention from both practical and theoretical points of view.

The creation of a new museum represents a fundamental activity for universities to develop public engagement, as an additional area of their performance. In this regard, universities preserve and enhance their cultural heritage by promoting a sustainable management of their collections and by engaging local community. In doing so, a social implication comes out: the higher awareness that university collections may be used responsibly for the intergenerational equity. Moreover, as long as economic sustainability is ensured, UMs can become a cultural hub for the community. Finally, it is remarkably noting that the preservation and enhancement of university collections enables stakeholders to make a "scientific journey" into the prestigious past of the city, the university and the community.

The focus on a precise stage of UMs life – the embryonic one – represents a methodological choice, as well as a limitation of this study. Hence, future research may extend to other stages

in order to detect whether and how the embedment of sustainability dimensions in the management of UMs evolves throughout their lives. Not least, further studies are welcomed to delve into causal relationships, that is to investigate which are the critical factors that either enable or constrains sustainability in UMs management.

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About the authors

Michela Magliacani is Associate Professor of Business Administration at the Department of Economics and Management of the University of Pavia. She received the PhD in Public Administration from the University of Siena. Her research field is focussed on cultural heritage management, accounting history and public accounting and management. She teaches sustainability management at the Master in Economics and Management of Culture and UNESCO Heritage at the University of Palermo.

Daniela Sorrentino is Research Fellow at the Department of Economics and Management of the University of Pavia and and Lecturer in Business and Administration at the University of Siena. She got a PhD in Business Administration and Management at the University of Pisa. Her main research interests focus on public management, public sector accounting and accountability, as well as on performance measurement systems in public administrations. She is member of the evaluation body of a Musical Higher Education Institute in Siena. Daniela Sorrentino is the corresponding author and can be contacted at: daniela.sorrentino@unipv.it