

Design challenges in creative systems

THEORIES, METHODS AND PRACTICES
FOR SUSTAINABILITY AND INCLUSION

Edited by
Paola Cordera and Raffaella Trocchianesi

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Preface

Cultural sustainability: handle with care

The concept of cultural sustainability is relatively young: it first appeared in 1987 in the seminal Brundtland Report commissioned by the UN. The title of the Report, *Our common future* already contained a combination of apocalyptic vision and encouraging suasion that would characterise the discussion on cultural preservation for the coming decades. It was the extension of a concept (and the related worries) framed for the growth of world population in 1798 by Thomas Malthus, and focused upon the expected clash between the economy and the environment in 1969 by thirty-three African Countries: the *National Environmental Policy Act* defined sustainable development as «economic development that may have benefits for current and future generations without harming the planet's resources or biological organisms». It already contains the uncomfortable mix of fear and hope, transforming a technical concept into a sentimental urgency. Replicating the legitimate obsession of the debate on sustainability for future generations, the Brundtland verb ends up reducing the concept itself of sustainability to a dimensional issue.

This reveals the different degree of urgency that the debate on culture and society attaches to the various layers of sustainability. In such a philosophical framework dominated by a skeptical view of society, the main threat that cultural heritage faces is related to its physical decay and the eventual risk of extinction: cultural heritage is fragile by nature; moreover, it is surrounded by a barbarian society whose practices can irreversibly harm it. Actually, despite some really fragile artworks and cultural manufactures like the *Lamentation over the Dead Christ* by Mantegna or some Greek Theatre in the Mediterranean basin, substantially cultural heritage is reasonably solid and durable. And, despite the commonplace view according to which many barbarians are ready to destroy artworks, we should highlight that often it was the cultivated (or simply powerful) milieu to weaken cultural heritage, breaking the male sexual organs and whitening the ancient statues, taking the marbles from the Coliseum to build baroque façades, stealing artworks from weak Countries to pretend that they were witnesses of our imaginary past.

Once we focus upon the forced emphasis on the presumed vocational decay and neglect of cultural heritage, sustainability takes a further dramatic feature, related to its financial dynamics. Not occasionally, the Brundtland call to awareness was crafted in a period when public budget started to appear constrained and not unlimited, how it might have seemed until the Eighties. The flow of privatisations, the growing weight of the Chicago economics, the policy orientations of the Reagan-Thatcher approach contributed to drag the cultural system and its conventional interpretation in less granted dynamics. In those years the postgraduate courses in cultural economics and management started to flourish. This ended up shifting the main focus of sustainability on its financial layer, starting a lively and intensive discussion on how museums, theatres and archaeological sites could strengthen their budgets adding commercial challenges such as restaurants, merchandising, sometimes seductive temporary exhibitions, to their core activity which remained structured as it had been for two centuries. Focusing upon financial issues, the quest for sustainability generated a bias in the interpretation of the cultural value chain, due to the separation between the semantic factors (which also include the setup of cultur-

al supply) on one hand, and the financial dynamics whose effectiveness was related to special effects aimed at attracting an audience incorrectly believed superficial and hasty, on the other hand.

Stones for clones

Connecting the apocalyptic view of material sustainability with the mechanical view of financial sustainability, cultural heritage has been managed invariably for two centuries: its shapes and formats had been crafted as justifications for the power of the emerging bourgeoisie, and after more than two hundred years they were no more able to establish a dialogue with contemporary society.

This depends upon the conventional view according to which past society was more cultivated and civilised, simply forgetting that the affluent layer of society was a minority, but it had the power and the privilege of writing history; the rest of society was simply invisible. Now, if the shared perception is still that cultivated people know everything, and that the others have no tools enabling them to interpret cultural contents, we just need to preserve the material shape of cultural heritage, in order for future generations to receive it whole and unreduced. We keep stones physically safe, and transmit their material integrity to clones: a homogeneous and static audience. In such a simplistic framework, our obvious worry is both material and financial. In the institutional setting where public budgets are no more unlimited and unconstrained, we just need to attract paying visitors and possibly some corporate sponsor.

This interpretation ignores many factors that could shed light on cultural heritage as a unique source of value in a changing economic, social and cultural paradigm in which the acknowledgement of the self as member of an elitist club is gradually disappearing and being replaced by the desire for exploration and discovery. In such a framework, the cultural value chain is generated by the semantic cauldron guarded and displayed in each component of cultural heritage (art-works, manufactures, remains, ruins, etc.). Once this value is recognised, shared and diffused, society proves ready and eager to maintain it alive and possibly eloquent, in order for next generations to receive much more than the mere material shape of objects. Physical sustainability is quite normal, financial sustainability often proves redundant.

What cultural heritage needs is cognitive sustainability: the technical knowledge and the critical interpretation aimed at extracting the value of cultural heritage in connection to its historical and social dynamics, its symbolic, political and sometimes ethical meaning, its technological features, its connections with its spirit of time. When Bizet steals *Carmen* from Merimée the battle of Sedan has been already lost, the Commune de Paris already experienced, and staging a prostitute and a serial killer would relieve the audience from its troubles; simply watching a cigar maker and an oedipal brigadier the audience cannot enjoy any discounts: the contradictions, gender conflict, and violence belong to the society where the audience comes from. Not occasionally, in the same years Eugène Delacroix starts to paint sea views, adopting the uncertain dioptré that will craft the glossary of the Impressionists. To next generations we can transmit an indefinite and self-fueling cultural value chain.

Cubes vs. trails

The centrality of cognitive sustainability does not imply any reductions of our attention for the material and the financial layers through which sustainability can be effectively pursued. It only requires a new map of urgencies, and a clear definition of the value chain, in order for the ethical bias to be possibly avoided: the discussions on the cultural system (from market dynamics to policy design) normally tend to overemphasize presumed spiritual factors affecting both managerial choices and consumer practices; such an interpretation reveals the improper combination of the ownership of an hermetic glossary on one hand, and the evident inferiority complex towards industry on the other. The cultural system conceives itself as a special area where only technicians can evaluate and decide, and at the same time as an ordinary sector where monetary metrics prevail upon any other possible indicators of health, consistency and perspective.

The analysis of sustainability can lead us to avoid the drifts of specialty and normality as the opposite sides of our troubled waters, a sort of Scylla and Charybdis between which cultural heritage struggles to grant itself a difficult and precarious equilibrium. Values need a dry and precise definition. In such a less poignant framework, material sustainability remains crucial, but it can be simply

faced and pursued through the technical acknowledgement – and regular control – of the degree of frailty and risk of each single artwork, manufacture, remain and ruin. Specific and effective interventions can grant appropriate and consistent safeguard, thus eliminating the feared risk of decay and extinction. On the opposite side, financial sustainability has evidently suffered the typical capitalistic bias of identifying value with money. Certainly, sound budgets are a comfortable symptom of solidity, but it could be reductive to consider them the main signal of success.

Although the dimension of revenues is an eloquent proxy of the scope for action, to focus upon it ends up inducing heritage management to pursue wide audiences also relying on the attractive power of blockbuster icons such as Impressionists, van Gogh, Klimt and the few that might appear familiar to whoever; the danger dwells in the frequent strangeness between these iconic traps on one hand, and the cultural identity of museum collections and identity on the other. Within a strategic orientation, audience's dimensions are much less important than the length of the visit, the inclination to come back, the willingness of bringing newcomers and widely share the cultural experience, the desire to participate more intensively to heritage life. This range of goals manages to establish systematic, interactive and motivated relationships between heritage and society, gradually transforming occasional newcomers into habitual visitors and eventually addicted consumers. This can grant a progressive growth in the degree of sustainability, fully respecting the *core business* of heritage: to generate value, to establish relationships, to activate critical thoughts.

In such a simple framework, the value chain is activated by the semantic eloquence of heritage, which requires a technical and critical analysis of the exhibition glossary. The still dominating format of a decorated white cube clearly proves obsolete: it is related to the taxonomic and hierarchical approach of the Nineteenth-century society, whose prominent members were worried to wash their dirty conscience as exploiters of the new manufacturing slavery; this is why culture was adopted as the symptom of ethical values, being given the burden of theatrically counterbalancing the emerging inequalities. Critical voices highlighted quite soon that such a format

made museums like cemeteries, also due to the ritual practices of visit, where position, movements, words and silences still are conventionally dosed. The critical exploration of contemporary society requires trails, rather than a static list of objects hanging on the wall.

Subjective discoveries

Cultural value chain arises (and gets energy) from the semantic effectiveness of heritage. This does not require any special effort on the part of cultural institutions, although the current view is oriented towards pro-active projects aimed at attracting the audience. This is generated by many commonplace misunderstandings: visits do not generate value with no prior knowledge; society is ignorant and indifferent; museums (and conventional cultural venues) are the only ones able to transmit cultural values. Actually, museums and cultural sites are simply stubborn in expecting society to adapt to a glossary firmly sculpted on bronze. Cultural values are taught, imposed, at best suggested, but almost never conveyed in a dialogic exchange. This violates the fundamentals of cultural demand, whose thread is crafted establishing semantic connections among the experiences carried out, like in an indefinite neural network whose dynamics recall the library described by Jorge Luis Borges: books talk to each other in an unpredictable, often mysterious way, and only experiencing it we can get value from this magmatic cross-fertilisation.

The subjectivity of appraisal and appreciation leads us to a crucial point, within the dilemmas related to value – and therefore sustainability – of cultural experience.

While in the Nineteenth- (and Twentieth-) century society among the main motivations for museum visits often was the urgency of self-assessment as members of an elitist club, the turn of the Millennium, along with the gradual fading of serial manufacturing dogmas and the symmetrical rise of accessible technology able to expand the emotional, cognitive and intellectual spectrum, highlighted a radically different orientation of the audience: visitors enter because they do not know what they will discover; of course, they might have some prior information about artworks, but they cannot (*rectius*: do not want to) predict their reaction, and consequentially the value that they will attribute to the experience itself.

This is something that they will be able to do only at the end of the visit. A sound extraction of their willingness-to-pay can occur after the cultural experience, due to the cross-fertilisation of previous visits, along with readings, discussions, within a versatile and multi-disciplinary framework.

In such a respect, the design of museum trails proves central for effectively and consistently pursuing sustainability, whose main value is related to the scope of strategic projects that cultural institutions can carry out, without being subject to the tight and rigid constraints they should face in a non-sustainable situation. Subjective discoveries require narrative connections between temporary exhibitions and permanent collections, possibly relying upon deposits to extract otherwise invisible artworks and manufactures. Furthermore, the cultural discourse aimed at optimising the perception of value on the part of a widely heterogeneous audience would be fueled and enriched activating a sort of tentacular network with cultural institutions located in the urban fabric, in order for visibility and dialogic ability to be clearly perceived by both residents and voyagers. This would imply a new interpretation of museums' endowment, no more as exclusive property, but as common heritage whose adoption, exhibition but also research and interpretation would strongly benefit from shared projects and joint action. Sustainability cannot be interpreted as the static dimension of heritage to be kept safe (implicitly dramatising danger, enemies, indifference), but as a dynamic process whose flow of knowledge and critical interpretation is being systematically enriched, in order to grant present value and future enjoyment.

Hybrid stumbles

The evolution of cultural value, activated through the passage between the late-industrial framework and the emerging economic, social and cultural paradigm, has been dramatised in the pandemic years, when the attempt at indefinitely delaying the acknowledgement of a radical mutation was vertically cut by the awareness that our relationship with space and time had irreversibly changed. It is time to rethink many consolidated dogmas, among which the heaviest – and probably the least justified – states that «art must not be de-contextualised». If this is the shared principle, no museum

could be accepted, being the most violent and evident form of de-contextualisation of art: even without diving into controversies such as the Elgin marbles' dilemma, the exhibited artworks forming museums' endowment were neither conceived nor crafted to end hanging on a wall, together with often stranger artworks along a didactic (and pedantic) timeline.

After all, the pandemic break induced the less dogmatic institutions to experiment innovative methods and tools aimed at facilitating and enhancing real interactivity, subjectivity of trails and exchanges, all based upon versatility and multi-disciplinarity of offer.

Such an unconventional approach radically re-designed the functions themselves of a museum as a complex process aimed at flexible dialogues with a heterogeneous and hopefully evolving audience.

In the cultural value chain, *for all* means *for each*. What we need is to reshape the glossary of cultural dialogue. The many varied attempts at combining the conventional description/explanation with some sensorial involvement might risk spoiling both factors, since each of them proves inadequate to establishing a multidimensional exchange with each visitor. Interaction does not mean theatricalisation, but width of the cultural discourse aimed at inviting and allowing each visitor to select and experience the layers and stages of the exchange in order for her/him to get the maximum benefit from the visit, in such a way actively contributing to sustainability: the dialogic value, based upon the semantic effectiveness of heritage, generates a dense financial fallout. This implies that monetary outcomes are not a goal, but simply the effect of cultural appraisal and appreciation.

A further reflection is related to the possible contribution of AI to sustainability. In such a respect, it could be somehow dangerous to associate the pursuit of sustainability to the (already) conventional algorithm aimed at tuning future choices to the past ones, in such a way encouraging a process of specialisation of each visitor through the accumulation of homologous works, styles and genres.

Looking at the issue from a non-prejudicial perspective, we should consider that versatility, exploration, discovery and surprise actually lead each visitor to perceive growingly intensive desires, which is eventually reflected in a wider demand. Within this framework, the adoption of AI as a stumbling tool simply pictures what we all do in

a bookshop, buying more and more varied books than the one(s) we came in for: a suggested algorithm should aim at displacing visitors, pushing each of them towards unpredictable, and in any case different, areas and languages, responding to her/his expectation of exploring and discovering further layers and stages of her/his cultural endowment and therefore to her/his critical interpretation. The cultural value chain passes through random access elaborations as well as hypertextual explorations. It is consolidated by shared experiences and systematic enrichment. Sustainable is a community whose solidity is favoured by creative processes and their impact upon social capital. Symmetrically, active communities intensify and share creative intuitions, critical interpretations, and managerial challenges, in such a way strengthening the pursuit of sustainability.

Michele Trimarchi

Tools for Culture

2. Design for cultural cooperation and sustainable tourism. Inclusive experience, accessible environments and heritage representation

Giuseppe Amoruso, Polina Mironenko

2.1 Sustainable Development Goals and the significance of culture

For the first time, the 2030 Agenda for Sustainable Development has acknowledged the significance of culture in achieving sustainable development. Adopted in September 2015 by the United Nations, the agenda is organized around 17 Sustainable Development Goals (henceforth SDGs) encompassing the five key areas of *People*, *Planet*, *Prosperity*, *Peace* and *Partnerships*. The 2030 Agenda implicitly references culture in many of its goals and targets (United Nations Department of Economic and Social Affairs, 2022).

If the SDGs are organized around the three foundational pillars of sustainable development – economic, social, and environmental objectives – then culture and creativity intersect and cross-cut each of these pillars. Sustainable development's economic, social, and environmental aspects reciprocally contribute to preserving cultural heritage and fostering creativity.

Tangible and intangible cultural heritage and creativity are vital

resources that require protection and thoughtful stewardship (Amoruso and Conte, 2022). They play a dual role in the SDGs: acting as catalysts for achieving these goals, and serving as facilitators, where culturally informed solutions can guarantee the effectiveness of initiatives to meet the SDGs.

Culture's importance is especially evident in Goal 11, which aims at creating sustainable human settlements, with its Target 11.4 focusing on the protection and preservation of global cultural and natural heritage. Additionally, Goal 4, which concentrates on education, includes Target 4.7, which seeks to ensure that learners gain the necessary knowledge and skills to foster sustainable development. This includes education for sustainable development, promoting peace and non-violence, global citizenship, and an appreciation of cultural diversity and the contribution of culture to sustainable development (Hosagrahar, 2019).

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), cultural and creative industries (CCIs) are defined as sectors engaged in organized activities primarily focused on producing, promoting, distributing and marketing goods, services and activities of a cultural, artistic or heritage nature. The term has been under discussion since the 1980s and 1990s, with the British government leading efforts to recognize these industries as part of the economic landscape. These activities fall within the framework of the orange economy, representing endeavours that transform human ideas into cultural products and services across various fields such as technology, theatre, dance, literature, music, art, fashion, design, animation and video games. Since the economic crisis of 2008, CCIs globally have played a significant role in enhancing value-focused economies that are well-positioned for recovery from global economic challenges. These industries contribute to the economy and to sustainable development by supporting the cultural and creative sectors. They particularly impact on social goals by improving quality of life, creating jobs and fostering social cohesion. The positive impacts of cultural and creative industries on sustainable development are evident in areas such as promoting technological innovation, job creation, social integration, preservation of cultural values, recognition of creative skills as valuable resources, urban re-

talization, rural development strategies, and fostering new concepts and behaviours that address social aspects (Borre *et al.*, 2023).



THEMATIC INDICATORS FOR CULTURE IN THE 2030 AGENDA



Figure 1.
The Culture I 2030
Indicators and the 2030
Agenda SDGs. Source:
UNESCO / Culture I 2030
Indicators.

A recent study addresses the scientific and practical challenge of identifying the link between cultural and creative industries and sustainable development. It models the connection between the sustainable development of regions and cultural, creative industries through a structured method. This involves calculating and analyzing correlation coefficients between the *Sustainable Development Goals Progress Index* and four key socio-economic indicators that define the condition of the cultural and creative sector: value-added, employment, and cultural spending by the state and by households. The research analyzed these indicators across EU countries over a decade, from 2011 to 2021. The findings from the correlation analysis validate the relationship between creative industries and the sustainable development of regions, demonstrating that nations with advanced cultural industries exhibit higher levels of progress toward sustainable development goals. Conversely, in countries with moderate to low correlations, the link between cultural industries and sustainable development achievements is negligible (Plutalov, 2023). The UNESCO Culture I 2030 Indicators is a set of thematic indicators

designed to evaluate and track the impact of culture on the national and local implementation of the Sustainable Development Goals (SDGs) and Targets within the 2030 Agenda for Sustainable Development. This framework aims to measure the role of culture as an independent sector and its cross-cutting influence across various SDGs and policy domains. Developed through a review process, this framework comprises 22 indicators organized into four thematic dimensions that align with the three pillars of sustainable development: social, environmental, and an additional dimension focused on education, knowledge, and skills in cultural fields. Each dimension features specific indicators, including their purpose, data sources and calculation methods. These indicators, both quantitative and qualitative, help assess a country or city's engagement with cultural resources in sustainable development, identifying policy gaps and potential directions for improvement (Figure 1).

The Culture I 2030 Indicators framework is part of UNESCO's commitment to integrating sustainable development concepts across its Culture Conventions and programmes, each offering unique perspectives and focuses. With the 2030 Agenda's adoption, these Conventions have incorporated relevant SDGs into their implementation and monitoring frameworks, aligning their objectives and identifying specific SDGs or Targets for integration. As instruments of international norms that heavily rely on international cooperation and capacity building, all six UNESCO Culture Conventions contribute directly to SDG 17 on Partnerships, especially Targets 17.9 (capacity building) and 17.16 (global partnership), and make a cross-cutting contribution to SDG 5 on gender equality, particularly Target 5.5 on women's participation and leadership.

The UNESCO Culture Conventions and programmes towards the 2030 Agenda are:

- Convention for the Protection of Cultural Property in the Event of Armed Conflict, and its two protocols (1954 and 1999);
- Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property (1970) and the Recommendation concerning the Protection and

Promotion of Museums and Collections, their Diversity and their Role in Society (2015);

- Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), the adoption of the World Heritage Sustainable Development Policy (2015) and the Recommendation on the Historic Urban Landscape (2011);
- Convention on the Protection of the Underwater Cultural Heritage (2001);
- Convention for the Safeguarding of the Intangible Cultural Heritage (2003);
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) and the 1980 Recommendation on the Status of the Artist.

Culture is central to achieving the Sustainable Development Goals, and contributes across economic, social, and environmental dimensions. Placing culture at the heart of development policies ensures a human-centred, inclusive and equitable approach to development.

2.2 Design for cultural cooperation and local development. Envisioning, empowering and practising

Design for cultural cooperation and sustainable tourism is a branch of investigation and a multiverse field of social innovation not yet densely documented by the literature; it encompasses several practices for designing systems for creativity and culture; it is a sector of application of theories and approaches where design-driven methodologies help local communities and emerging countries to foster inclusive society, to make accessible cultural content and to release services for a diverse range of populations including disabled people and young scholars.

Economic expansion and social cohesion are based on developing a knowledge-based society capable of competing internationally (OECD, 2000). A strategic vision that enables greater economic and social resilience. The objective is to limit the economic dimension of

cultural heritage, and its associated cultural industries and practices, so that they find the basis for extending or enhancing their service offer through a framework of qualification and innovation of human resources. The global scenario requires new skills integrating design, creativity, technological and managerial skills as assets for competitiveness and sustainable and inclusive growth.

The operational contribution aims to achieve tangible results in technical-professional training, as one of the main functional areas supporting responsible and sustainable tourism and the conservation of cultural and natural heritage.

Among the specific objectives:

- identify the development potential of sustainable and quality tourism and the strategic areas of innovation, to increase the competitiveness of the cultural tourism industry;
- improve the relevance, quality, effectiveness and attractiveness of Technical and Vocational Education and Training (TVET) in response to the need for innovation and technological advancement in the tourism sector.

The outcomes establish a strategic plan for developing knowledge and skill-intensive human capital to increase the global competitiveness of the tourism industry and improve the visitor experience through innovation in product development. Follow-up actions include identifying innovative professionals and related skills and competence requirements for the tourism industry, conservation, and enhancement of cultural heritage and landscapes (Amoruso *et al.*, 2023).

In the sector of cultural heritage, tangible and intangible heritage, local traditions and the cultural landscape, the aim of strategic actions is to:

- strengthen studies on cultural heritage and local traditions;
- develop smart applications for cultural heritage serving museum systems and archaeological sites, new exhibition and user interaction strategies, audience development, and development of digital services;
- enhance the potential of design as an activator of social innovation and as a lever in social inclusion processes;
- design training initiatives for entrepreneurship.

2.3 Delivering a strategic plan for cultural accessibility and dissemination within museum facilities

The chapter addresses a research plan of cooperation and local development in Jordan based on a strategic framework for improving and enhancing cultural facilities, making culture accessible, and increasing awareness about the museum to sustain the inclusion of young scholars and disabled users.

The connection between the thematic framework and the executive research varies according to the different kinds of deliverable:

- creating sustainable tourism and local growth;
- encouraging heritage studies;
- outlining digital documentation standards;
- introducing participatory and co-design processes;
- empowering people, through universal design and cultural accessibility, to have meaningful and memorable experiences in museums and sites of interest.

In the study case, field tests and process references will benefit from the recent research on the Roman Theatre of Amman conducted alongside an international cooperation project (Amoruso, 2023). Actions served to activate regional culture and protect the diversity of cultural heritage, enhancing universal accessibility and dissemination of content.

The Italian Agency for Development Cooperation, in agreement with the Department of Antiquities of the Ministry of Tourism and Antiquities of the Hashemite Kingdom of Jordan, funded the Program for the definition of a strategic plan for the improvement and the enhancement of the Folklore Museum, the Museum of Popular Traditions, and the site of the Roman Theatre in Amman; and the Technical Assistance to Contribute to the Definition of a Strategic Development Plan for Tourism and Human Resources in Jordan.

Both programmes have been operated by the Department of Design of the Politecnico di Milano since 2020, over a three-year action plan under the scientific directorship of Giuseppe Amoruso.

Museums and cultural heritage sites are powerful assets for local

development. They can inspire creativity, boost cultural diversity, help regenerate local economies, attract visitors, and bring revenue. There is also increasing evidence that they can contribute to social cohesion, civic engagement, health and well-being (OECD/ICOM, 2019).

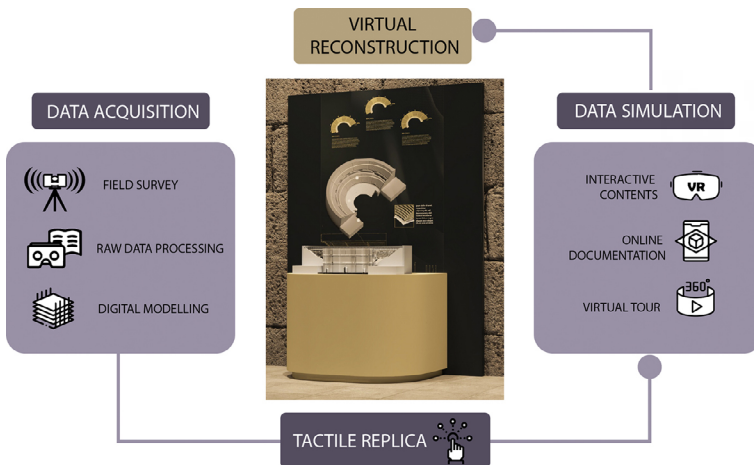


Figure 2. Museum information modelling. Proposal of a workflow for the production of significant objects and environmental simulation. Source by Giuseppe Amoruso and Polina Mironenko.

The workflow presents effective methods to digitize resources based on the different natures of various types of heritage, and to devise experiential design and interactive environments through advanced simulation and representation of museum environments. The aim is to appropriately incorporate these resources into the museum's capacity to attract visitors, considering different target groups, stakeholders and inclusion needs (Figure 2). The study researches all the related objects during a visit to an archaeological/cultural site, including visitors, exhibitions, the physical environment and local people. For this purpose, a model of a cultural landscape museum was issued, and the interaction design within its environment was released. To achieve the final goals, the process addresses the following questions:

- How can we define and classify regional cultural resources and use appropriate digital technologies to display them visually?
- How can we enable the transformation and accessibility of cultural-regional museums?

- How can an interaction design model be developed based on dynamic simulations of existing installations and experiential environments for cultural sites?
- How can we evaluate the effectiveness of the process and design workflow, introducing modelling (CAD/BIM) and simulation environments (Game Engine/AI)?

The project demonstrates how to put design strategies into practice through a participatory process, test methodologies through digitization, improve awareness through mock-ups and communication artifacts, and engage new audiences by developing the prototype of a digital library to share living traditions among diverse generations (Amoruso *et al.*, 2023).

The innovative research addresses digital design and representation, focussing on the emerging themes of digital heritage, content digitization, and universal accessibility. It also tests the use of modelling and simulation environments (BIM and Game Engine) integrated with the emergent need to experiment with the visual programming language (VPL) for interior design (Amoruso and Mironenko, 2022). An itinerary and interactive display of tangible/intangible heritage were presented and tested through the advanced simulation application to visualize immersive 3D environments (Figure 3). From the Building Information Modelling (BIM), the direct link provides a live connection with the game engine suite, and facilitates graphic simulation and audio, and kinematics, with the support of artificial intelligence (AI) (Amoruso and Buratti, 2022). The methodological research objectives are:

- to explore a systematic museum interaction design framework that can use digital technology to highlight cultural content and improve cultural attraction and communication efficiency, rather than just an isolated and interesting interactive device providing entertainment;
- to explore how to use digital technology to digitize different types of cultural heritage and make them accessible;
- the deliverables provided cultural and heritage operators with a flexible interaction design toolkit of applications, installations and contents, according to which they could choose appropriate interactive forms based on factors such as heritage fields, cultural themes and visitor groups.

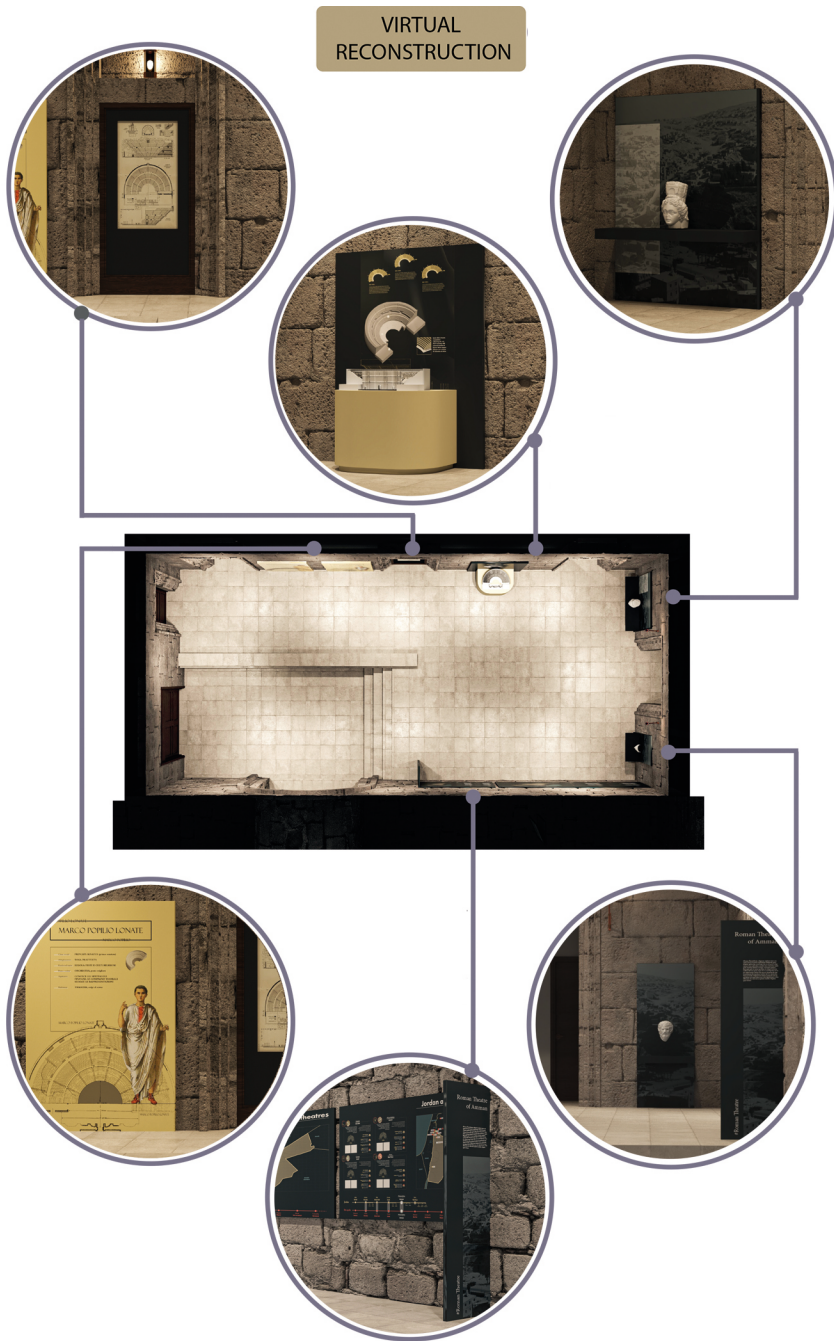


Figure 3.
Interactive installations for the Roman Theatre experience.
Source by Giuseppe Amoruso and Polina Mironenko.

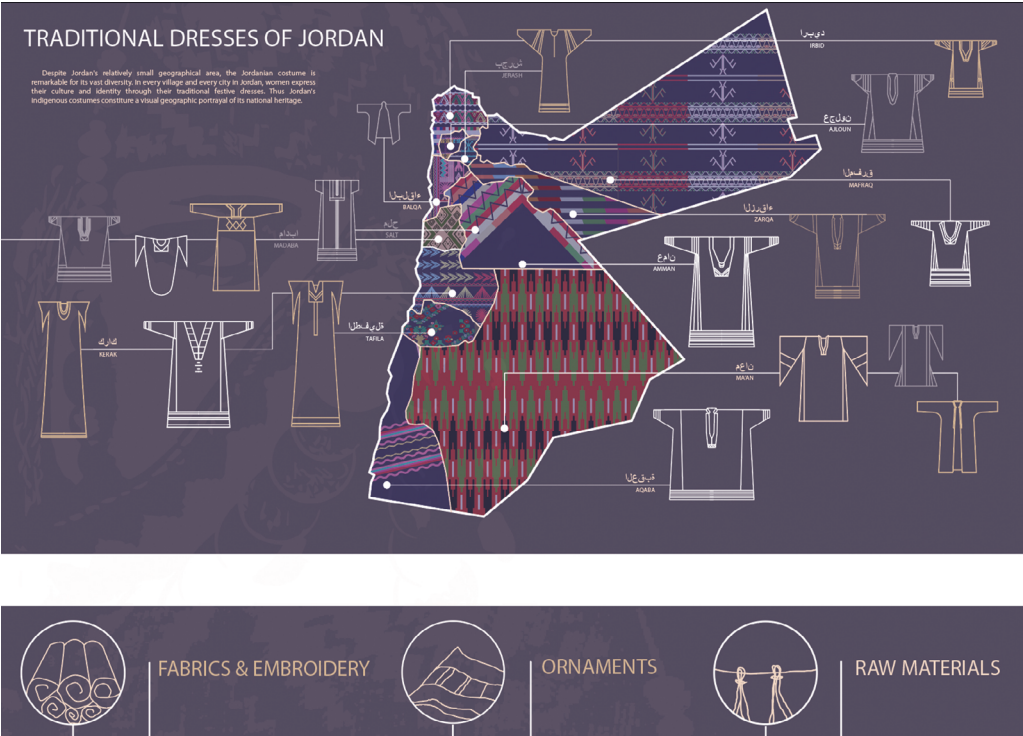
2.4 Future scenario and conclusion

In recent years, national strategies for sustainable development have increasingly acknowledged the cultural and creative sectors as key drivers for achieving cultural, social and economic objectives. Despite this recognition, the broader role of culture and creativity in supporting sustainable development, particularly in the environmental transition, has not received sufficient investment, as noted by UNESCO, despite the SDG report addressing culture as a global public good (2022). The challenge of harnessing the transformative potential of culture and creativity to promote a transition towards more sustainable practices remains a significant task for these sectors.

The experimented workflow makes it possible to idealize the outcomes in the form of vision/approach and application/guideline, to leverage the power of sustainable tourism and cultural facilities for local economic development in international cooperation. Design strategies foster a new concept of heritage and also an innovative vision of nation branding across sustainable tourism policies. Strategic design contributes to the definition of a plan for developing responsible and sustainable tourism in emerging countries and the necessary needs in terms of human resources (Amoruso *et al.*, 2023). Analyzing the current international scenario, the strategic plan could have positive effects by increasing the contribution of the tourism sector to the country's economic, social and sustainable well-being, acting on fundamental levers – such as technological and organizational innovation; ability to adapt to market transformations; valorization of territorial and cultural heritage; skills development – as favourable conditions to promote and support new entrepreneurial activities.

The process allows the identification of new professional profiles and technical skills required in a broader perspective of developing human resources and employment in the tourism sector, focussing on cultural heritage, cultural and creative industries, sustainable cultural tourism and cultural infrastructure. Design-driven strategies allow local and regional governments to evaluate and enhance their strategies for optimizing the social and economic benefits of cultural heritage. The study investigated the most promising areas

where museums can significantly contribute to local development. For this purpose, the project included improving the Folklore Museum and the Museum of Popular Traditions in Amman as the manifesto of the Jordanian cultural landscape. It transformed content into experiences by applying technological systems, innovative experiential installations and multimedia stations, and creating educational resources.



The development of a communication plan for the Roman Theatre – envisaged through the 3D reconstruction of the architectural model, and the creation of a universal accessibility system with advanced multimedia systems – brought awareness and social inclusion into play among the young generation, e.g. with the use of gaming and learning tools for school groups (Amoruso and Carioni, 2023).

The objective is to ensure effective implementation of the right of universal access to culture, as indicated in the Faro Convention (art. 12), which introduced the need to «promote actions to improve access to cultural heritage, in particular for young people and dis-

Figure 4.
Parallel of traditional dresses of Jordan.
Proposal of an interactive wallboard to display and engage the audience.
Source by Giuseppe Amoruso and Polina Mironenko.

advantaged people, to increase awareness of its value, the need to conserve and preserve it and the benefits that can derive from it».

Key concepts introduced by the Convention consider «cultural heritage», being «a set of resources inherited from the past that people identify, regardless of who owns them, as a reflection and expression of their values, beliefs, knowledge and constantly evolving traditions» (art. 2).

Design for cultural cooperation draws attention to strategies and actions that support the elimination or mitigation of physical and cognitive barriers, so that all people can access culture and can benefit from tourism as a common good and as a means of collective welfare for a global sustainable life. Designers and local stakeholders can effectively contribute to principles and practices using recommendations to monitor targets, set indicators and milestones, and involve direct beneficiaries to foster societies that are both culturally aware and creatively vibrant; it is essential to nurture environments where diversity is celebrated and cross-disciplinary collaboration is encouraged.

This involves creating spaces where individuals from various backgrounds and industries can come together to share ideas and perspectives, thereby enriching collective creativity and cultural understanding.

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