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Tradition to Digital Ecosystem: A Study of the Orange Economy in the Context of the SDGs

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Abstract
This contribution examines a representative dimension of the handicrafts heritage of Salamanca, Guanajuato, which is deeply rooted in the historical production of bronze figures, mystical religious wax figures, and the ornamental technique of layered wax decorations used on ceremonial tapers and candles. These tangible and intangible heritage practices may be promoted within emerging digital markets by technological media and the intensive use of data. The study therefore proposes, at a preliminary level, a digital ecosystem that brings together artisanal groups and selected professional competencies developed at the Digital Arts programme of the University of Guanajuato (UG). The proposal draws on the guidelines of the Orange Economy as a means of reinforcing cultural activity and considers their relevance to selected Sustainable Development Goals (SDGs), and towards the Guanajuato State Government Programme 2024–2030 (PG 24–30), and the UG Institutional Development Plan 2021–2030 (PLADI 21–30). The study adopts a qualitative methodology based on documentary analysis, contextual appraisal of local arts and crafts, and prospective model-building. It identifies opportunities for collaborative projects involving digital documentation, audiovisual production, and social innovation among others, and also involving different techniques of implementation, for the benefit of craftsmen, the academic community, and society.

Keywords: Traditional crafts; digital arts; cultural heritage; Orange Economy; Sustainable Development Goals.

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1. Introduction

The study of cultural and creative artisanal industries encompasses recognising a concept advanced by Theodor Adorno in 1949, referring to the techniques of industrial reproduction involved in the creation and mass distribution of art and cultural artefacts (Lebrún Aspíllaga, 2014, p. 46). As the concept developed, UNESCO (2010) proposed a broad classification comprising three sectors that combine the creation, production, and commercialisation of content grounded in the often intangible and culturally sensitive nature of such art objects as they are distributed and sold to tourists, aficionados, and common consumers of décor. It was already proposed that handicrafts be protected by copyright, but without differentiating authors, as these artefacts have a tradition-bound origin of replicable characters. The traditional cultural industries include publishing, audiovisual and phonographic production; a further sector comprises the visual and performing arts, cultural tourism, and sport; while a third, more recent sector is associated with multimedia. In a related account, Bustamante Ramírez (2017, p. 95) describes the flow of economic activity with the metaphor of a river running from the Mountain (raw materials) to the Valley (commercialisation and the consumer), through a series of stages, as illustrated in Figure 1.

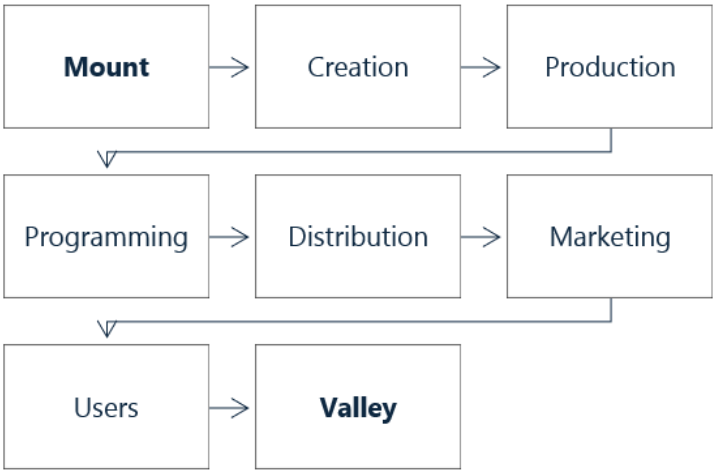


Figure 1. Economic flow across the sectors, from creation to commercialisation. Adapted from Bustamante Ramírez (2017).

Regarding the relationship between creative and cultural industries and the so-called Orange Economy, Zanella Martínez et al. (2021, p. 88) describe the latter as 'an unlimited developmental opportunity through which knowledge and conventional culture can be used as resources to generate benefits'. Creative cultural industries and the Orange Economy are therefore part of a growth system inseparable from the economic dynamics of the twenty-first century. The Inter-American Development Bank (IDB) reports figures that illustrate the adaptation of certain creative industries to these dynamics. In Mexico, for example, the craft sector generated 480,000 jobs in 2021, equivalent to 37.7% of cultural employment, although informal sales reached up to 79% of total cultural industrial turnover. These figures expose a critical gap in the creative ecosystem and point to the need to connect traditional sectors more closely with areas such as tourism through dedicated national policy (IDB, 2026).

The city of Salamanca, Guanajuato, in Mexico's central Bajío region, brings together an environment in which tradition and innovation may appear to be in opposition. On the one hand,

the practice of handicraft making and sales has been handed down since the eighteenth century, particularly (a) the making of sculptural religious images in wax and (b) forms of guild-based manual production. On the other hand, the University of Guanajuato (2026) offers a higher-education programme in Digital Arts, through which students develop competencies in digital production projects, interactive design, animation, multimedia, and cultural management—areas that correspond to certain principles identified by UNESCO (2010). Their coexistence creates potential conditions for interdisciplinary collaboration through a digital ecosystem that could preserve, document, and bring the craft heritage into new technological and commercial contexts. Such a model would connect the University's institutional priorities with its surrounding community, regional development plans established by the State, and the SDGs of the Agenda for 2030. The study is therefore guided by the following central question: How can Salamanca's handicraft and artisanal heritage be connected with the professional competencies of digital artists, in alignment with the development goals of the Orange Economy that the state (PG 24-30) and federal governments (SDG) of Mexico, in consonance with Latin America's objectives of sustainable development goals, have planted for emulation by ramified architectures like education (PLADI 21–30) ?

2. Methodology

The study adopts a qualitative methodology based on documentary evidence from expert sources and official institutions, contextual specification, and prospective construction of the proposed model. Its purpose is to identify opportunities for collaboration in emerging digital fields, including documentation, heritage preservation, interactive design, audiovisual production, e-commerce, and the development of projects on social innovation. These activities are intended to support the gradual and sustainable development of Salamanca's creative-cultural and craft industries. The study pursues the following specific objectives:

1. To examine documentary sources relating to cultural and craft heritage, the SDG, PG 24–30, and the UG Institutional Development Plan 2021–2030 (PLADI UG 21–30).
2. To identify the principal craft activities currently practised in Mexico's local crafts-making regions and their local roots.
3. To reconstruct a prospective framework connecting craftspeople, the University, government, and the creative sector for a proposal for a functionally valid and reproducible collaborative Digital Ecosystem.

3. Context

Cultural Heritage

The conservation of tangible, intangible, and mixed cultural heritage can strengthen a community's identity through the transmission of knowledge across generations. The testimonies and historical evidence associated with heritage can inform crafts that originate within families and expand into community groups. Such activity may develop into forms of entrepreneurship in which traditional occupations provide livelihoods through employment grounded in cultural resources. This relationship has evolved in contemporary societies, where growth is also expected

to be inclusive rather than marginal, and to protect heritage sustainably. Accordingly, the Mexican State, through its regional policy frameworks, establishes plans that connect culture and the economy over different time horizons.

Craft Cultural Heritage

How should a product of manual craft-making be understood? Loza Ramírez (2023, p. 162), drawing on UNESCO (2014) guidelines, provides the following description:

> Products made entirely by crafts-people by hand, or with the aid of hand tools and also mechanical means, signifies that the craftsperson's direct manual contribution remains the most important component of the finished product. Such products are made without restrictions on quantity, and use raw materials derived from renewable resources. The distinctive nature of handcrafted products lies in their particular characteristics, which may be utilitarian, aesthetic, artistic, creative, cultural, decorative, functional, symbolic, and significant from a religious or social point of view.

Craft culture, interpreted likewise, embodies a form of thought that extends beyond the initial idea. It emerges from the constellation of experiences surrounding the object: the making and use of tools, the workshop, the craftsperson's temporal rhythms, and ancestral beliefs. It is the transformation of material into an expression of identity for a social group.

The Sustainable Development Goals

In the context of global economic growth and its collateral effects, including social inequality and environmental degradation, nations face challenges that cannot be postponed. In Latin America and the Caribbean, the situation is particularly acute, not because the region is the poorest in the world, but because of its pronounced inequality. In 2015, Member States of the United Nations adopted the 2030 Agenda for Sustainable Development, comprising 17 global goals (CEPAL, 2016, p. 7). The present study selects the goals listed in Table 1 (CEPAL Naciones Unidas, 2019) that are of immediate relevance for the handcrafted production ecosystems that are available and that share functional continuity in the economy of regions considered for the study.

Table 1

Selected goals for the Latin American and Caribbean region

SDG	Vision for Latin America and the Caribbean
4	Quality education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities.
8	Decent work and economic growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all.
9	Industry, innovation and infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation.
11	Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient, and sustainable.
17	Partnerships for the goals: Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development.

Note. SDG priorities emerging from the forum convened by the Economic Commission for Latin America and the Caribbean (ECLAC) in Santiago, 24–26 April 2019.

PG 24–30

For Mexican states like Guanajuato for example, the PG 24–30 programme (Government of the State of Guanajuato, 2025) identifies strategies relating to social vocation and prosperity. These are connected with the SDGs outlined above and concern creative industries, the Orange Economy, education, and heritage—areas closely associated with craft activity (Table 2).

Table 2

Strategies drawn from PG 24–30 and their links with the SDGs and craft heritage

SDG	PG 24–30: relevant actions
4	The strategy seeks to reduce illiteracy and educational disadvantage among people aged 15 and over, ensuring lifelong access to learning and cultural enrichment. The knowledge economy in Guanajuato will be strengthened by linking teacher education with innovation and technological development (p. 20).
8	A key component is to attract more investment to consolidate value chains, diversify the economy, and promote sustainability. This priority seeks to strengthen tourism in the State by promoting tangible and intangible cultural heritage, museums, and archaeological sites, while stimulating the Orange Economy through itinerant cultural circuits, artistic residencies, and creative laboratories (p. 21).
9	This priority establishes the foundations for each region of the State to achieve its development potential through talent development, the promotion of reading, innovation, and the productive capacities of local areas (pp. 20–21).
11	This priority seeks to strengthen tourism by promoting tangible and intangible cultural heritage, museums, and archaeological sites, while stimulating the Orange Economy through itinerant cultural circuits, artistic residencies, and creative laboratories (p. 21).
17	'The knowledge economy in Guanajuato will be strengthened by linking teacher education with innovation and technological development' (p. 20).

UG PLADI 21–30

Focusing on the setting in which the Salamanca region's handicraft tradition has developed, and on the relevance of the local University programme in diaciplines like Digital Arts, the University's Development Plan identifies reveals how the following institutional strengths are underscored (University of Guanajuato, Mexico 2021):

> The disciplinary focus should therefore be oriented 'to make engagement with society a fundamental and transversal attribute of the core functions of education, as the most sincere response that higher education institutions can offer to society's real needs, and to make education a principle of integrated (economic, social, and cultural) and sustainable development. To ensure the relevance of education through increasingly close and effective engagement with social and economic needs and with the productive and business sectors, fostering cooperation among all participants in education within a framework of shared responsibility. To promote cultural industries by harmonising the

> conservation and protection of cultural heritage with more effective links between culture and tourism promotion, thereby generating employment and regional development. (pp. 86–87)

Although craft activity encourages residents and visitors alike to take home a handmade object that conveys the cultural values of its makers, there is a need for social sustainability that connects craft practices with other sectors within an ecosystem developed across different time horizons. This entails a shared set of opportunities for heritage preservation and academic transformation, alongside tourism-related functions, within a complex structure of historically formed knowledge, techniques, values, and identities. PG 24–30 and PLADI UG 21–30 offer an innovative and directive framework that calls for the prevention of commercialisation and the decontextualisation of cultural heritage. At the same time, from a critical perspective, technological development should enable models of knowledge co-creation with craftspeople who possess deep and embodied knowledge. In this way, the Orange Economy may become a means of building equitable intergenerational partnerships that sustain living heritage in contemporary Salamanca.

4. The City of Salamanca's Established Craft Practices Today

The following account is drawn from an interview with Juan José Rodríguez Chávez (2026), the emeritus chronicler of the municipality of Salamanca, who maintains close contact with local guilds and craft occupations and was asked about craft practices currently carried out in the municipality.

Bronze figures (Figure 2)

'[The practice] dates from the third decade of the twentieth century. The work is carried out by craftspeople in the southern districts and neighbourhoods of Salamanca, including La Guanajuato, Los Pinos, and La Gloria, among others. The figure or object is produced with three types of finish: polished or gilded bronze, rustic bronze with an aged finish, and bronze with a green patina. These bronze products are also sold in craft shops and markets in tourist cities across the country, particularly in the north-central part of Guanajuato State, including Dolores Hidalgo and San Miguel de Allende, as well as at major fairs in Mexico.'



Figure 2. Bronze bells produced using traditional casting, shown in three finishes: gilded, rustic, and green-patinated. Photograph courtesy of Caudillo Méndez (2026).

Mystical religious wax figures (Figure 3)

'Several family-run workshops continue this genuinely Salmantine tradition, which is said to have been handed down by Augustinian friars in the seventeenth century. The craft is internationally recognised. Salamanca is also renowned for its magnificent, artistic, and monumental Christmas nativity scenes featuring wax figures. The traditional figure, in a standard size of approximately 30 centimetres, is carefully modelled and displays considerable aesthetic beauty. Larger figures are also made, including scenes depicting the Three Wise Men mounted on camels, complete with garments and other finely detailed objects.'



Figure 3. Small-scale religious wax sculptures depicting a Christian biblical scene. Photograph courtesy of Caudillo Méndez (2026).

Layered wax decoration on ceremonial tapers and candles (Figure 4)

'The practice dates from the nineteenth century and has been passed down from parents to children in Salmantine households. It is visible in some of the city's most deeply rooted and popular traditions. The decorated candles are presented as offerings, ranging from modest to monumental and richly coloured displays, during the patron-saint festivals of neighbourhoods, districts, rural communities, and churches. They are also used during religious celebrations such as Corpus Christi and the festivities organised by occupational guilds in honour of the Blessed Sacrament at the Diocesan Shrine of Christ, the Lord of the Hospital. These celebrations take place over ten days, in the final days of May or the beginning of June each year.'



Figure 4. Decorative candle made using the layered-wax technique. Photograph courtesy of Caudillo Méndez (2026).

5. Results

The findings point towards the prospective and strategic development of a model in which traditional craftspeople in Salamanca are recognised as the generators and custodians of heritage knowledge, working alongside students and graduates of Digital Arts. Their participation would enable knowledge and experience to be documented through digital languages and formats, supporting creative industries in transforming cultural content into high-quality cultural goods and services. The Orange Economy could thereby generate economic and social value grounded in SDGs 4, 8, 9, 11, and 17, as well as in the objectives set out in PG 24–30 and PLADI 21–30. The final proposal is therefore structured as an integrated Digital Ecosystem with three implementation horizons: short term (1–3 years), medium term (4–7 years), and long term (8–15 years). The proposed model is presented in Table 3.

Table 3

Digital Ecosystem: Salamanca's traditional crafts – Orange Economy – SDGs

Time frame	Workstream	Actions and proposed participation
Short term (1–3 years)	Digital documentation	Actions: photographic records, digitisation of objects, and audiovisual cataloguing. Student and graduate participation: photography, documentary production, and editorial design. SDGs: 4 and 11.
Short term (1–3 years)	Cultural dissemination	Actions: social media, websites, virtual exhibitions, and related activities. Student and graduate participation: graphic design, digital

		marketing, and multimedia production. SDGs: 8 and 17.
Medium term (4–7 years)	Craft innovation laboratory	Development of 3D scanning projects and three-dimensional cataloguing. Student and graduate participation: user experience and user interface design (UX/UI).
Medium term (4–7 years)	Digital tourist routes	Mobile applications, geolocation, and immersive experiences. SDGs: 9 and 11.
Medium term (4–7 years)	Creative enterprise incubator	Bringing together craftspeople, designers, programmers, marketing professionals, and related practitioners.
Long term (8–15 years)	Regional centre for craft heritage	Research, innovation, and continuing education.
Long term (8–15 years)	International virtual museum	Virtual reality, immersive tours, digital collections, transmedia narratives, and artificial intelligence.
Long term (8–15 years)	Global commercial platform	Development of a global platform for the marketing and sale of craft products.

6. Conclusion

This contribution demonstrates that certain craftlike activities common to local artisanal market dynamics within the Mexican local artisanal market and consumer economies form a convergent system of mixed heritage, inherited knowledge, identity, and historical memory. Beyond their economic function or their manifestations as folklore, these crafts involve symbolic and intergenerational social processes. The study identifies a form of coexistence that has remained largely unrecognized as a common business model between the town's craft guilds and those academic institutions who teach, study, and operate as agents in the field of digital arts. This relationship offers opportunities of developing strategies for the preservation, documentation, and dissemination of the heritage under consideration by means of digital communication technologies. Innovation should not, in this context, be understood as opposed to a community's traditions. Rather, it should be regarded as a set of instruments that can secure their continuity, visibility, and sustainability within increasingly prominent digital environments. The convergence of Orange Economy offers considerable potential for the preliminary design of developmental models by incorporating education, innovation, heritage, entrepreneurship, and social sectors.

From an academic perspective, the study opens a discussion among stakeholders in cultural heritage, digital arts, and the Orange Economy—a subject that warrants further exploration in Mexico and Latin America. It is essential that craftspeople in Salamanca and other regions participate directly in decisions concerning the management of their heritage practices. The study also has limitations arising from its exploratory and documentary character and from the limited testimonial engagement with local chroniclers, although that always proves to be valuable. The proposed model should therefore be taken forward through prospective validation, supported by applied and field-based research. Its findings should not be generalised or applied to other craft

practices in Guanajuato or Mexico, especially in ones which may exhibit different or more advanced dynamics.

Finally, the study recommends participatory work involving craftspeople, students, and teaching staff in processes of knowledge co-creation, digital documentation, and technological experimentation. Such work should maintain a critical perspective on the opportunities offered by the Orange Economy and its ability to generate economic and social value, while recognising the risks of commercialising and symbolically diminishing traditional knowledge. These risks require shared responsibility among all stakeholders if craft practices are to be sustained for future generations in the twenty-first century.

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