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## **The digitisation of the ksourian cultural heritage . Implementing a knowledge dissemination model to promote the sustainable protection and safeguard of culture**

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### **Abstract**

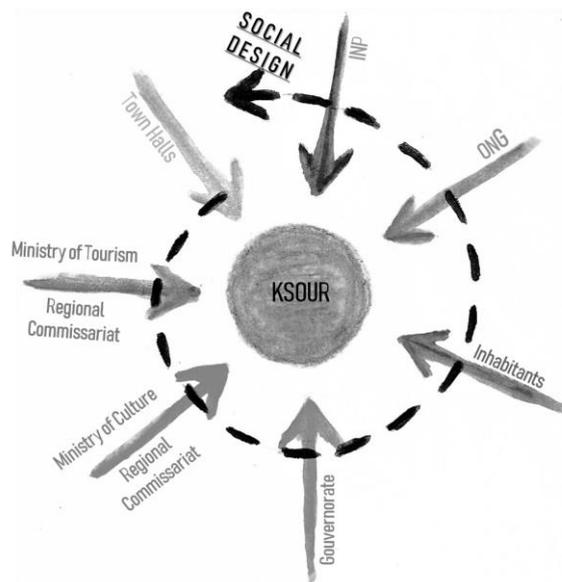
*Cultural heritage is a precious asset that attributes a specificity belonging to a region or country. Cultural heritage does not stop at material artifacts but also includes traditions or living expressions transmitted from generation to generation. The richness of the cultural heritage should be preserved and developed as it plays a major role in the social and economic field of the region. Although often threatened, tangible and intangible cultural heritage is essential for maintaining cultural diversity in the face of increasing globalization. The processes of globalization have widened the space for daily relationships, whether social, economic, cultural or political. Knowing one's cultural heritage promotes intercultural dialogue and thus makes it possible to trace collective identities through traditional reference points. The new possibilities offered by the information society and the emergence of new technologies make it possible to safeguard and disseminate knowledge beyond the usual traditional representations. The digitisation of heritage makes it possible to offer not only virtual reality tourist tour applications, but also applications for sharing scientific knowledge. As part of this research project conducted in Tataouine, we applied an interdisciplinary approach to develop theoretical and practical models of the digitization of heritage around the conservation and dissemination of knowledge and know-how while addressing social and economic issues and concerns..*

**Keywords:** Digitisation, economy, Ksourian cultural heritage, information design, innovation, service design, social design, , sustainable development, tourism.



## 1. Introduction to a design of the Heterotopic Desert

"The Heterotopic Desert"<sup>1</sup> is a cultural, scientific and tourist project carried out in the form of two major events in Tataouine, Tunisia. The first one was held from 24<sup>th</sup> to 28<sup>th</sup> April 2018 and the second from 2<sup>nd</sup> to 4<sup>th</sup> May 2019. Based on the concepts of "heterotopia" (Foucault, 1984), and "hospitality" (Mauss, 1995; Derrida, 1997; Montandon, 2000, 2004; Gotman, 2001), various activities were coordinated such as visits to the Ksour, conferences, debates, shows, workshops and final presentations. This original project idea was initially born from the reflection aimed at enhancing the value of Ksourian cultural heritage through the creation of a dialogue with civil society and the various stakeholders. To tackle the challenge of co-creating a durable mechanism to generate sustainable value creation. Ellouze (2019) consider a possible contribution of social design to the innovation of local production, to the appreciation of the Ksour and to their preservation.



*Fig. 1 The contribution of social design to the ksour problem according to the research-project approach.  
Source: Ellouze, N. (2019)*

<sup>1</sup> The "Heterotopic Desert" project is part of Nesrine Ellouze's doctoral research development (2019). It adopts the "research-project" approach (Findeli, 2015) in design in the field of social innovation. The research is inspired by the complex requirements of the field and focused on the region of South-East Tunisia specifically the Governorate of Tataouine. The purpose of the project, at the heart of public policy, is the promotion culture in the ksour according to an intercultural, interdisciplinary, solidarity and social approach (fig.1).

Social innovation comes with many challenges due to the complexity of multi-disciplinary actors and the environmental systems involved in the process of value co-creation (Gutiérrez et al, 2016). To initiate our social design approach, we combined different design-based disciplines to the project to facilitate communication, collaboration and ideation. Both events gave rise to experiences and debates on the Tataouine region, principally on the Ksour, particular architectural spaces in the south-eastern Tunisia.

The two events brought together several participants from different backgrounds and nationalities. Through immersion in the local culture through, different experiences, interaction between participants, exchange of information, identification of unshared habits and norms, the first event-based project promoted divergent thinking possibilities allowing each stakeholder to propose its vision on the value propositions according to user's needs and profile initially raised by stakeholders during the workshops. The work process was based on methodologies from social design, co-design and service design, and the proposals presented collectively constructed results adapted to the context.

The second session of the event-based project, uniting once again several national and international professionals with local entrepreneurs, was dedicated to convergent thinking in order to reduce the scope of possibilities and to target more accurate and pertinent propositions. Those propositions were selected through a competition "How to revive the ksours throughout the year?". As a result, more specific proposals were made for economic and cultural development, elucidated by specific cultural characteristics, know-how and local practices. The chosen proposals were then co-designed in a workshop translating into precise value propositions of each of these services and a business model. At the end of the workshop, the participants presented the final propositions to potential shareholders.

All this know-how has revealed an originality that gives typicality to the products originating from this region. While a Ksar can be perceived as a meeting place for local actors and between local professionals, our proposal aims to place tradition and technology at the heart of this setting, which is conducive to exchanges. In this case, traditional know-how will be explained and made available to the public through the digital platform bay, while also promoting exchanges between food technology experts and local producers. Regular exchanges with other disciplines such as health, art or economics can be organized. Organic, industrial or biodynamic agriculture can be explained, demystified and promoted.



## 2. Ksourian cultural heritage and heterotopia

This article focuses on the cultural heritage theme, in particular the ksour, which are particular archaeological, architectural, cultural and heritage spaces. By definition, ksour (singular: ksar) are collective granaries that were used for the conservation of goods and food. For Louis (1975, p. 11), the ksar appears as a building "frequently drizzled in the Dantean setting of a cliff where we do not always know where the village ends and the mountain begins, where only a trained eye can grasp what is djebel (the mountain) and what is a fortified granary".

According to Ellouze (2019, p.48), there are two main types of heterotopia: "the endured heterotopias and the conceived heterotopias. The former, such as prison or asylum, impose themselves on their "inhabitants", sometimes in a pathological or violent way. The second are spaces conceived ('designed') according to heterotopic principles for a particular purpose, mainly emancipatory or 'empowering'. What interests us in our approach is the conceived heterotopias and this is what the author referred to Foucault (1966) by stipulating that: "the purpose and effect of conceiving a heterotopy is to make a familiar space foreign to open a space of possibilities". This vision of the heterotopic has guided the "Heterotopic Desert" project in these two sessions leading us in a logical reflection considering the Ksourian cultural heritage as a lever for sustainable development through digitalization.

## 3. Digitisation and dissemination of content

Placing our reflection in its context, Ayeb (2011) acknowledged that the democratic revolution in Tunisia has made the country more open, first to itself, to what is called Tunisian's heartland and then to its geopolitical environment. With this in mind, leading international research projects on cultural heritage contributes directly and indirectly to the sustainable development of the regions. We believe that digitization presents an effective tool that will contribute over the years to Tunisian society to better manage its heritage resources. Digitisation through digital platforms makes it possible to make available to the public the knowledge on the tangible and intangible Ksourian heritage accumulated during the projects. The expertise acquired and the results obtained during the projects will be perpetuated through archiving, thanks to the creation of a digital platform for the Ksourian heritage.

Consequently, moving from paper-based mediums to digital media for the storage and management of information on the region's heritage will generate specialized databases providing, to users, allowing fast and easy access to information collected on site. Using a



participatory approach based on information design, we propose to digitize, to photograph, to films and to document all the expertise and knowledge, in order to safeguard as much information as possible about the different sites visited. Our goal is also to improve the content collected by 3D digital archiving for reconstruction of old objects and the duplication of old parts.

Digitalisation and interactivity offer opportunities to strengthen networking activities between the various heritage stakeholders. The digitisation project can contribute positively and efficiently, through its interdisciplinary approach and dialogue with civil society and the various stakeholders, to the inhabitants regarding their cultural heritage: they can discover their own diversity and initiate an intercultural conversation about what they have in common. Reconciliation with this heritage can strengthen the sense of belonging and foster a culture of tolerance and openness. In this case, we are talking about social inclusion and regional stability.

#### 4. Methodology

As part of this research, we have developed an innovative approach to heritage preservation based on service design techniques combined with knowledge and knowledge management. The objective is to take into account the co-production elements inherent in any complex service system as well as the necessary interaction between explicit (information) and tacit (know-how) knowledge.

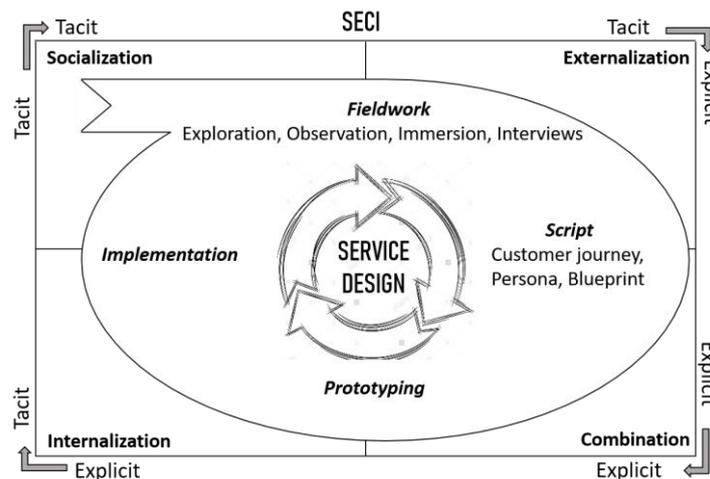


Fig. 2 Creation (Service Design) and Knowledge Sharing (SECI)  
 Source: SECI model and SDLab model adapted by authors



Service design is a rigorous and systematic process that goes from the concept of service to its realization (Fragnière et al, 2018). A production of services has the particularity that customers are both co-producers and that the raw material of the service is considered as knowledge. In this section, we explain, from the scientific literature, how explicit and tacit knowledge is crucial to understanding the digitization of service processes.

According to Nonaka (1994), two types of knowledge can be conceptually distinguished on a continuum: Tacit, non-verbalizable, intuitive and non-articulated knowledge, which involves a nuanced understanding, builds on the know-how and wisdom accumulated through collaborative experience and is therefore difficult to formalize and communicate (Nonaka, 1994; Nonaka & Takeuchi, 1995; Reed & DeFillippi, 1990); and explicit knowledge, which is mainly codified.

In knowledge-based services, intellectual capital integrated with people and systems is essential. This evolution implies a different organizational model that is based more on creativity and implicit knowledge, which is the very essence of expertise. Unfortunately, in the digitisation of work, only the dimension of explicit knowledge is taken into account. In fact, explicit and tacit knowledge will play a crucial role in the digital services of tomorrow. They must then be orchestrated precisely.

#### 4.1. Case study

The SECI model was used to theorize and formally institutionalize the various processes of knowledge creation, conversion and transmission. The model consists of four distinct, successive and deeply interrelated steps (SI & Management, 2016):

1. **Socialization:** sharing and creation of tacit knowledge between individuals, through direct experience

In order to reach agreement among the participants, we need to achieve a common and understandable vision of the project. This collective vision will make it possible to describe the project and discuss it. It is essential that stakeholders share the same vision and goals, and that they all talk about the same thing. To initiate the project, the steering committee proposed a concept that would allow us to start thinking about the organization's economic and tourism model. The following is a summary of the elements that have been proposed:

The organization's missions

- Promotion and enhancement of the tangible and intangible cultural heritage



- Promotion of the consumer and user experience
  - Promotion of exchanges and human relations (producers and consumers)
2. **Externalisation:** conversion of tacit knowledge into a common (explicit) language, shared within a group (conceptualisation of tacit knowledge, creation of a common culture):

The exercise begins with different episodes of immersion, observations and interviews to start to build the modelling of new digital processes. A first observation drawings and sketches of the Ksar made it possible to imagine coherent and coordinated interactions between human expertise, the information system and any external IT service provider. Co-creation between stakeholders allowed relevant analysis of risks as well as opportunities for innovation and improvement..

Through a first workshop, this phase was devoted to a convergent reflection to reduce the scope of possibilities and find several common proposals. The research team synthesized the previous results and compared offers that met the same types of needs to inspire participants. Finally, the selected proposals were submitted to the workshop participants in the form of a vote to prioritize needs. Finally, the typology process resulted in five forms of specialized services.

The organization's main areas of activity

Point of sale - Place of innovation - Place of training - Place of education and information - Demonstration workshops

3. **Combination:** the group's knowledge is formally structured (codified) within or outside the organization (hypotheses, prototypes, models):

The second workshop then focused on co-creating a more precise service design using customer journey map. The various actors were able to put themselves in the user's shoes to reflect on their journey and offer them the best possible experience.

This phase was based on internal and external knowledge, as well as on combining knowledge, including contributions from identified best practices, and the tacit knowledge of professionals.

4. **Internalization:** learning and acquisition of new tacit knowledge by individuals in the organization, through the practical experience of codified knowledge, which forms the basis for new socialization routines:

Each project was presented in the form of a presentation, followed by a question and discussion period. According to the ideas put forward by the participants, three types of economic models are emerging with similar but above all complementary configurations or behaviours: (1) an organization based on customer relations, (2) an organization based on



service innovation and (3) an organization based on heritage preservation. In addition, there is a desire to offer niche products, where these original products will constitute the bulk of income, not only from the sale of the products, but from their enhancement through educational activities, support for innovation and promotion. The site will therefore be a multifaceted platform bringing together distinct but interdependent actors. This platform will create value by enabling interactions between these different actors. Thus, to grow in value, this platform will have to attract more users (customers) by developing a network effect. Later on, the organisation could become a "Office (or Agency)" of the local products and produce by acting as an intermediary between visitors and their representatives on the one hand and artisans/producers on the other. The Ksar would thus become the centre of competence and information on heritage and local products, thus broadening their range of offers.

#### **4.2. Modeling – Through Information design**

To structure this digital platform and its corresponding application, we rely on the precepts of information design operating on both analog and digital media, with the aim of optimizing information with the user. According to the International Institute for Information Design (IIID, 2014, p.2) information design "aims at transforming data into high-quality information to empower people to attain goals". As "high quality" attributes, it is important to keep in mind, according to IIID, the following features: accessible; appropriate; attractive; believable; complete; concise; errorless; interpretable; relevant; objective; timely; secure; understandable; valuable. According to Frascara (2011), good information design takes into account such attributes, adapting content to the situation in which it occurs, articulating the information interface in a useful and attractive way.

Thus, the precepts of information design - and the tools that flow from them - guide the planning (evaluation, organization) and design of information presentation, for effective use by users while taking into account its syntactic, semantic and pragmatic aspects. Descriptive and explanatory models are useful tools for this purpose. For the development of the platform announced in this article, we rely on the model (fig.3) proposed by Padovani et al (2017), developed from the analysis of existing descriptive models for application interfaces in Mobile Interaction Devices (MIDs). This model synthesized the parameters found in other models, tested their effectiveness and made the necessary corrections, predicting the following application situations (Padovani et al, 2017, p. 124-125):



- a) Analysis of the existing application: in the case of a summative evaluation and/or redesign of the existing application, where the intention is to understand the structure and graphic presentation of the application and then to evaluate it;
- b) Analysis of similar applications: when developing a new application, when the intention is to know the trend of competing applications available on the market;
- c) Development of a new application, where the intention is to define (progressively, throughout the design process) and record the characteristics of the application, so that all project stakeholders are informed of the decisions taken.

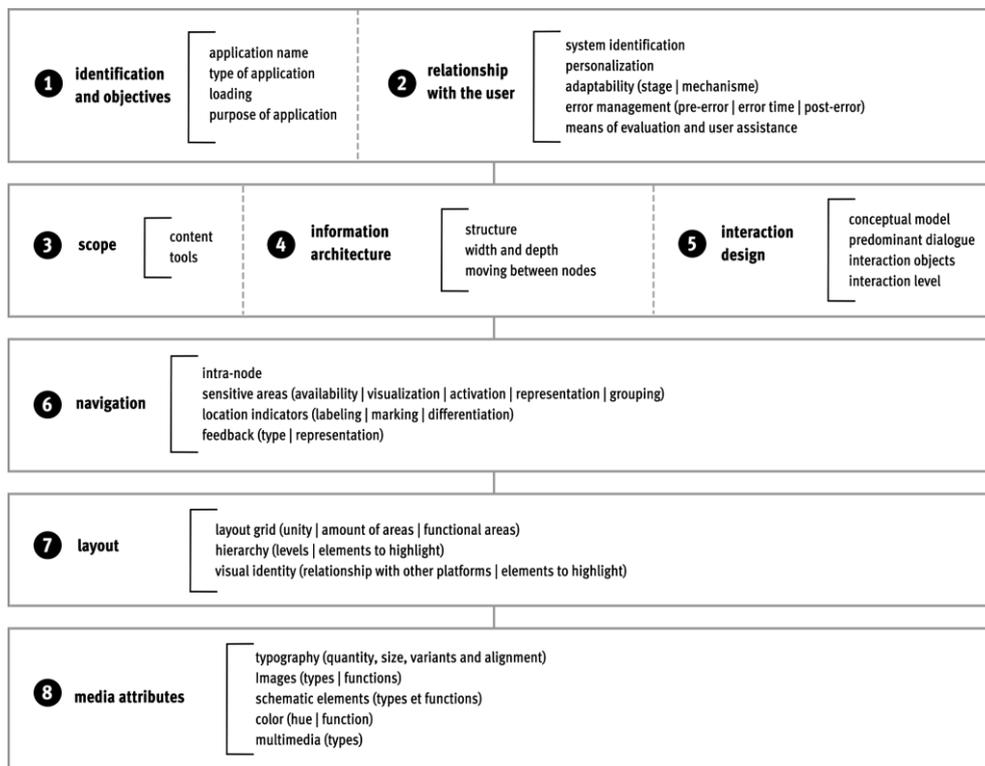


Fig. 3 Descriptive model for application interfaces on smartphones  
 Font: Padovani et al (2017)

In this way, the model will be useful both to analyze existing applications on ksour and the Tataouine region with similar applications, as well as to organize and share information during the platform/application construction process between designers, developers and other participants.

In addition to its occasional usefulness as a tool for analysis and structural work organisation, information design is integrated into the project in the broad sense as a link between different



design domains (social design, service design and information design), thus providing feedback on the process of potential innovation based on the experiences generated by the application (fig.4).

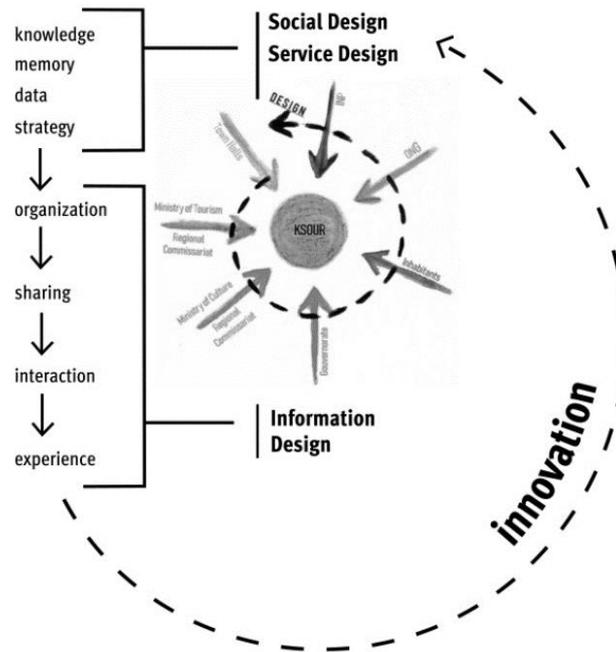


Fig. 4 Feedback from the design process  
Source: Authors' contribution

## 5. Conclusion

The renewal of the site offers the opportunity to develop new services to the population in the vast field of agritourism, including the enhancement of local products and agricultural production, tourism reception, information on agriculture and local products or produce, restoration and promotion of local products and activities, leisure, direct sales by a cooperative or any other legal form. It is therefore important to develop a strategic plan for the Ksar that allows the different partners to accomplish their respective missions.



Based on the results of the work carried out, the identification of these skills and, above all, taking into account the main objective of the events carried out - the preservation of the tangible and intangible cultural heritage - comes the proposal for the institutionalization and dissemination of the knowledge generated by a digital platform and its application. The objective of this article, based on the report and systematization of the work developed in Tataouine during these two events, is to retrace the path followed towards the proposal to digitize and institutionalize knowledge of the Ksourian cultural heritage. Its potential strength as a new place of memory, will enhancement of the region's heritage, economic, cultural and tourism development. In addition we gathered, along this path, knowledge from different fields of design: the guiding approach to social design, the strategic and methodological contribution of service design and the principles and tools of information design to lead the development of the proposal to digitize Ksourian material and immaterial heritage.

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