Massimiliano Lo Turco

Elisabetta Caterina Giovannini and Noemi Mafrici

edited by

Digital & Documentation

Digital Strategies for Cultural Heritage

Volume 2

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The volume consists of a collection of contributions from the seminar "Digital & Documentation: Digital Strategies fo Cultural Heritage", realised at the Politecnico di Torino on June 14th, 2019. The event, organized by the "BIM Acquisition as Cultural Key TO Transfer Heritage of ancient Egypt For many Uses To many Users REplayed" - B.A.C.K. TO T.H.E. F.U.T.U.RE. Project - team of DAD - Department of Architecture and Design of Politecnico di Torino, promotes the themes of digital modeling and virtual environments applied to the documentation of architectural scenarios and the implementation of museum complexes through communication programs of immersive fruition.

The event has provide the contribution of external experts and lecturers in the field of digital documentation for Cultural Heritage. The scientific responsible for the organization of the event is Prof. Massimiliano Lo Turco, Politecnico di Torino.

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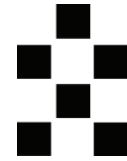|	
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The event "Digital & Documentation - Vol. 2" has seen the participation of professors, researchers, scholars and private institutions

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INDEX

Daniele Rossi is Associate professor of Digital Representation at the School of Architecture and Design of University of Camerino. The research work of Rossi is particularly targeted at the relationship between design and architecture, new didactic forms of representation and use of IT in surveying and representation. He is interested in investigating the role of digital media technologies in creative practices, learning, representing, and the production of knowledge. For some years he has been working in virtual and augmented reality, both in teaching, where he teaches Tecniche della realtà virtuale e immersiva for the Unicam Master's degree course in Computational, and in the research activity participating in numerous conferences and research projects concerning VR and AR.
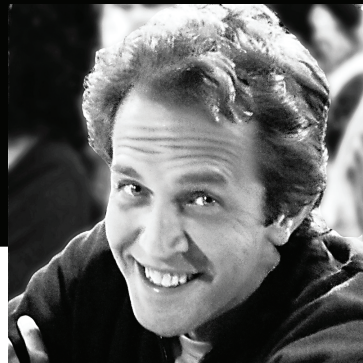
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Carlo Vinti is a researcher in design and visual communication at the School of Architecture and Design of University of Camerino. Co-curator with Giorgio Bigatti of the project Comunicare l'impresa (www.houseorgan.net), he is associate editor of the AIS/Design. Storia e ricerche online journal. Since 2016 his research has mainly focused on the animated digital archive as a strategic storytelling and communication device. He addressed this specific subject in two recent research activities: a research project on the historical heritage of three food & beverage brands financed by Davide Campari Spa and a research period (spring 2018) spent at the Laboratoire Geriico (Information and Communication Sciences) of the University of Lille (France).

11 FOOD AND WINE HERITAGE IN THE MARCHE REGION: DIGITAL STORYTELLING THROUGH VIRTUAL AND AUGMENTED REALITY

Daniele Rossi, Federico Orfeo Oppedisano, Carlo Vinti

Abstract

The local wine and food heritage is a crucial element of the identity of a territory and often becomes a crucial theme in tourism promotion. Typical food and wine products are used both to develop branding strategies aimed at redefining the image of a territory and to launch initiatives in the field of experiential tourism. However, so far there are not many projects that explore the potential of Virtual Reality (VR) and Augmented Reality (AR) technologies in this field. Recently, the rapid development of devices that allow the use of Mixed Reality (VR and AR) has made these technologies - which have been known for decades but have always been relegated to the experimental field of technological and media research - very topical. This article aims to summarize the assumptions of an interdisciplinary research concerning the enhancement and storytelling of the wine and food heritage through applications built on technologies of Mixed Reality.

The purpose of the research is twofold: to investigate, in general, what are the potential of VR and AR to enhance and promote the richness of the territory in terms of wine and food heritage; experiment with new design strategies and new forms of communication through the use of cutting edge technology, in particular, in the case of the Marche Region.

Il patrimonio enogastronomico locale costituisce un elemento cruciale dell'identità di un territorio e diventa spesso un indispensabile strumento di promozione e di attrazione turistica. I prodotti enogastronomici tipici sono usati sia per mettere a punto strategie di branding volte a ridefinire l'immagine di un territorio sia per iniziative nel settore del turismo esperienziale. Tuttavia finora non sono molti in questo campo i progetti che esplorano le potenzialità delle tecnologie di Realtà Virtuale (VR) e Aumentata (AR), particolarmente adatte a valorizzare tale patrimonio in una chiave esperienziale. Il rapido e recente sviluppo di dispositivi che consentono la fruizione di Mixed Reality ha reso di grande attualità queste tecnologie note da decenni ma da sempre relegate all'ambito sperimentale della ricerca tecnologica e mediatica. Questo articolo intende illustrare presupposti e obiettivi di un progetto di ricerca interdisciplinare centrato sulla narrazione per la valorizzazione del patrimonio enogastronomico attraverso tecnologie innovative per la mixed reality, fruita sia tramite visori binoculari sia tramite la mediazione di un dispositivo (tablet, monitor, ecc.).

Lo scopo della ricerca è duplice: indagare, in generale, quali sono le potenzialità di VR e AR per valorizzare e promuovere la ricchezza del territorio in termini di patrimonio enogastronomico; sperimentare nuove strategie di progettazione e nuove forme di comunicazione attraverso l'utilizzo di tecnologie innovative, in particolare, nel caso della Regione Marche.

Introduction - Concept and objectives

In recent years the importance of gastronomic tourism has been steadily increasing, both in terms of demand and supply, resulting in the development of large tourist areas that have managed to endorse territorial value relying on the quality of typical productions, culinary traditions, the rural landscape, the quality of the environment and, more generally, on a wide range of other intangible natural attractions[1].

In a vision of cultural heritage which is not limited to buildings and statues, food and wine are part of intangible heritage: a set of rich traditions in societies that are passed down the generations and are certainly no less important to preserve for the future.

Typical food and wine products, intended as part of a socio-cultural system, constitute a key-element of the local cultural heritage as well as a crucial factor for the development and promotion of places and regions. This project focus on the enhancement and storytelling of food and wine heritage, intended as essential components of a "territorial capital".

The new challenge of tourism today is to imagine new strategies of preservation and fruition, and, above all, approaches to management that place the local community at the centre, and which, at the same time, activate the visitor, placing him in harmony with the context: with the history of the place and its food and wine traditions. Interest in food is often strictly linked to, and associated with, its history, which bestows on it a unique value and contributes to creating an excellent quality product. The focus of this article - which summarizes the assumptions of a newly started interdisciplinary research at the School of Architecture and Design of the University of Camerino - is therefore on the idea of "experience", going beyond a pure valorisation for tourism purposes, in order to encourage the creation of new forms of communication of the wine and food heritage through applications built on technologies

of Mixed Reality[2].

The research aims in particular at providing technologically innovative instruments based on mixed reality systems in order to tell and disseminate food and beverage traditions of the Marche region and their history.

The systems and applications that are intended to be developed through research are aimed at increasing the visitor's interest in food and environmental education by enhancing not only local products but also the places of origin and the production chains typical of Marche wine and food.

Therefore, the research aims to design innovative food and wine itineraries, able to guide users towards the knowledge of local food and wine excellences such as: *olive all'ascolana, mela rosa dei Sibillini, miele dei monti azzurri, formaggi di Fossa, salame di Fabriano, pecora sopravvissana, ciuascolo dell'alta marca, crescia fogliata di Fiuminata, torrone di Camerino, salame di fichi marchigiano, verdicchio di Matelica, Vernaccia di Serrapetrona, vino cotto di Loro Piceno, pesca della Valdaso, pesce dell'adriatico, vincisgrassi, carciofo di Monte Lupone* and so on.

Visual design for the enhancement of the territory

Typical regional food and wine products are not to be intended as mere food or beverage. As several studies have shown, food and wine products are the result of a local socio-economic system, made of natural and cultural resources[3]. This is particularly true in agricultural districts such as those of the Marche region, where the excellence of the products is based on a mix of quality of production (local manufacturing and culinary traditions), quality of the territory and landscape (cultural heritage, environmental protection, etc.) and quality of life (human relations, well-being, etc.). For these reasons, typical regional products have a rich story to tell in terms of territorial capital: namely, as the product of a territorial system made of economic, cultural, social and environmental assets[4].

Fig. 1 - Mario Giacomelli, photography from the series *Storie di terra - presa di coscienza sulla natura.*

Fig. 2 - Tullio Pericoli, *Senza titolo*, 2016.

A territorial capital is a complex set of different material and immaterial components: physical resources (architectural and artistic heritage, environmental heritage), culture and identity (mentality, shared values and traditions) as well as human resources, know-how and skills (companies and local production activities)[5]. Food and wine products play a crucial role in building a territorial capital: they are fundamental elements of the territorial identity, often becoming an indispensable promotional mean and a tourist attractor. As such they can even brand an entire region, as the cases of Barolo/Langhe, Franciacorta or

Chianti show. Local products are often the focus of specific branding strategies aimed at redefining the image of territories[6] and are increasingly at the centre of activities focused on experiential tourism. However, so far only very few of such projects and initiatives have explored the potential of VR and AR technologies in improving, enhancing and amplifying the experiential dimension (immersive, multimedia and multisensory).

In recent years, research by design in Italy has often focused on the enhancement and communication of territories. Since the 1980s, several projects have been

Fig. 3 - Mario Giacomelli, photography from the series *Storie di terra - presa di coscienza sulla natura*.

Fig. 4 - Tullio Pericoli, *Terre rosse*, 2007.

Fig. 5 - Mario Giacomelli, photography from the series *Storie di terra - presa di coscienza sulla natura*.

Fig. 6 - Tullio Pericoli, *Paesaggio instabile*, 1998.
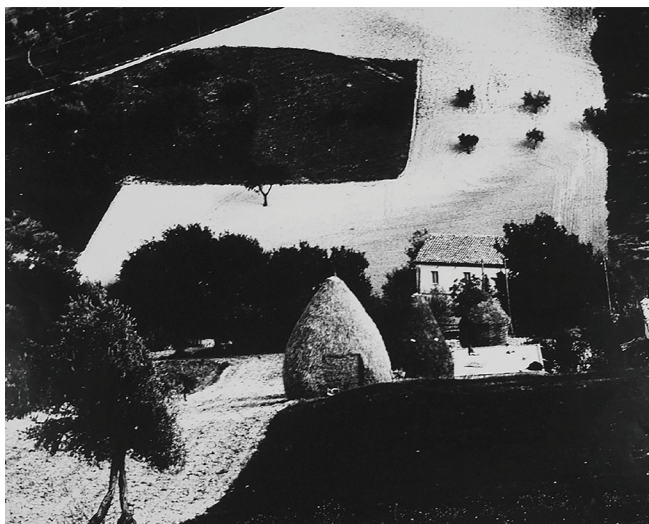
based on design as a methodological tool able to enhance, tell and innovate the local cultural heritage, both material and immaterial[7]. These projects have shown that design can be an important driving force for innovation and the economic and social development of territories, but also to support and stimulate the ability of local communities to discover and recognize potential territorial assets and transform them into real resources[8].

In design-driven processes aimed at the enhancement of territories, visual design can play a crucial role especially for the creation of narrative strategies. Narrative tools can be employed at different stages: from the analytical and exploratory phase to the definition and implementation of different actions and interventions. In the specific context of this project, visual design will contribute to positioning the use of VR and AR technologies in the context of a broader storytelling strategy based on experiential activities like, for example, the exploration of local itineraries for discovering food and wine quality products (when, where and how they are produced and consumed).

VR and AR technologies: context, definitions and state of the art.

When, in the mid-1970s, Myron Krueger[9] coined the term Artificial Reality, his goal was to define a kind of digital experience so immersive that he could be perceived as real. He used the concept of Artificial Reality as a tool for examining man-machine relations, analysing possible exchange interfaces, and examining the socio-cultural relations associated with it.

In the early 1990s, the idea of Artificial Reality was overtaken by the concept of Reality-Virtuality continuum, graphically synthesized by Paul Milgram[10]: in a horizontal segment where he pointed to the two extremes the Real and Virtual, and in the range of the two, a Mixed Reality type that blurs in Augmented Reality or Augmented Virtuality depending on the names that can be traced in literature. Milgram then used this definition to construct a taxonomy of visual systems for environments in Mixed Reality depending on the degree of immersion required and the immersion device.

If the user has experience of a reality where what is actually existing around if we are adding structured digital information we are in the field of Augmented Reality, or that field of computer graphics that investigates the possibility of superimposing the perceived reality of digital elaborations. Vice versa if the user has experience of a completely artificially digital reality where digital information is structured to conform the perceived world then we are in what Jaron Lanier in the early 1980s had called Virtual Reality[11].

To date, virtual reality, augmented reality, mixed reality, haptic feedback, gesture recognition, etc., are technologies that tend to become more and more confused with each other and can be grouped just under the the general term of Artificial Reality, thus achieving Krueger's predictions.

With the launch of Google Cardboard and the crowdfunding campaign to fund the Oculus Rift project suddenly, in the

Fig. 7 - Mario Giacomelli, photography from the series *Storie di terra - presa di coscienza sulla natura.*

early '10s of the new millennium, the commercial interest for a sector that remained for too long was the subject of interest for a few research centres or for sci-fi cinemas.

At first Google with its Glass has attempted new pioneering ways in the reality field, and then quickly released the first virtual reality viewers by the Oculus Rift team followed by HTC with the Vive that uses the Steam distribution platform, and the Playstation VR, which has definitively attacked the home gaming console market.

In addition to these complete HMD viewers, some less expensive alternatives involve the use of smartphones and tablets to integrate apps and mobile solutions through "adapters" such as Samsung Gear or Google Daydream.

On the other hand, augmented reality as well as other technologies of military origin (GPS navigators, the first mobile phones, drones) have already been used in industry since the 1960s. It can therefore be said that the AR applications, more than VR applications are used in the production, logistics and distribution phases. By means of AR headset, for example, two people can discuss a problem in real time by observing the subject of the problem, without being in the same place. In the same way, an employee can be assisted in every operation by a series

Fig. 8 - Tullio Pericoli, *Paesaggio instabile*, 1998

of instructions projected on his AR viewer. He can operate safely and supervised by more experienced colleagues.

Indeed, from the point of view of the consumer most of the apps we use every day will be enhanced by AR. In this case there will be no need for additional devices because all that is needed is one of the most widespread communication tools in the world: the smartphone. In this regard, just think about the investments made by two of the major players in the IT industry: Google, through the ARcore platform for Android, and Apple with ARkit. Furthermore, Microsoft is ready for Hololens' worldwide launch that will make promises made and temporarily abandoned by Google Glass technology.

Methodology and objectives

Digital technologies have radically changed the approach to knowledge by transforming cultural and heritage sites into interactive, interconnected and multimedia environments, enabling you to explore, learn, share, and deepen in an exciting way. In the same way, technologies born and used for areas related to gaming and entertainment can help in the valorisation and promotion of an entire territory characterized by a specific agri-food ecosystem.

The research project discussed in this article aims to be a pilot experiment in the use of VR and AR technologies for the enhancement of the territory as a whole and not of a single artefact. In particular, the goal is improving the Marche region and its excellence in the agri-food and food-and-wine sector, providing historical/cultural information through digital 3D applications directed to a wider public composed of broadcasting audience, network users, tourists, scholars as well students and teachers of high schools and universities.

One of the challenges identified by the *Regional Smart Specialization Strategy*[12] is to increase the diffusion of ICT in the productive business fabric.

Among the main purposes of this Strategy is the promotion of the transition from the current district system towards a new industrial organization able to support traditional productive vocations with a qualitative improvement and a technological upgrade.

The project development strategy is therefore aimed at revitalizing the productive fabric of the Marche through the focus on certain advanced technological fields such as Domotics, (Design & Virtual Simulation and Prototyping) and ICT understood as transversal enabling technology.

In order to build a theorical and methodological framework the research project will follow three distinct phases:

In a first phase a study on the state of the art will be carried out to identify, in agreement with the stakeholders of the territory, some case studies on which to develop the experiments. Particular attention will be paid to case studies from different food and wine sectors belonging to different geographical areas (inland and coastal areas). The completion of this phase will lead to a series of methodological indications useful for the definition of a first methodological-experimental idea.

In the second phase, a series of narrative data will be collected, and analyses will be carried out on the case studies identified, with the aim of constructing a database populated by cultural, historical and artistic information. This database will be the basis of a multimedia archive from which to draw all the data to be disseminated and shared in the third and final phase of setting up applications in virtual reality and augmented reality.

The third and last phase will be dedicated to the implementation, processing and validation of VR and AR applications in accordance with the indications and contents coming from the two previous project phases.

In order to elaborate virtual reality and augmented reality experiences, these applications will be examined by means of different verification methods, evaluating their performance and development prospects and testing them on expert and inexperienced users, as well as operators in the food and wine sector. Operators who will have the

task of testing the potential of these applications both for tourist-promotional and productive purposes.

Conclusions

Digital mediation techniques, three-dimensional models, 360 panoramas, dynamic interfaces, redefined spaces and times of learning. Indeed, it is indisputable that today the "new" media are the protagonists of a "shift" towards renewed communication models that aim to an extension of the cultural offer in an increasingly rapid and immediate form. The communicative actions and the new forms of representation aim to facilitate understanding, to clarify aspects of complexity, to present concepts in a clearer and more concise manner, to make the information more explicit and useful, while at the same time ensuring a high level of scientific content.

The above discussed research project – which is now in its early stages of development - will narrate the peculiarities of the Marche landscape in terms of food and wine heritage, through devices and applications with different levels of immersion. In recent years the opportunity to enjoy immersive experiences, but also non-immersive, virtual reality or augmented reality, has expanded to the extent of being considered within the reach of all.

Furthermore, VR experiences in the tourism sector nowadays seems to offer mostly marketing solutions for the promotion, with the aim of generating a favourable disposition towards the destination in the users. Mixed reality technology therefore appears to be a powerful tool for enriching and innovating the traditional ways of promoting a territory on the web (web sites, mobile apps, social media, ...). In this framework, the research project described in this article is intended to provide technologically innovative instruments based on mixed reality systems to tell and disseminate the variety of the food and beverage industry and its history linked to the territory of origin[13].

Note

[1] Cf. Bellencin, Meneghel 1991; Antonioli, Corigliano 2004; Montanari, 2008; Pioletti 2015.

[2] The research project presented in this article and called "*Food and Wine Heritage in the Marche Region: Digital Storytelling Through Virtual and Augmented Reality*" is financed with funds from the University of Camerino (FAR, Fondo d'Ateeo per la Ricerca) through a comparative evaluation procedure carried out by double blind reviewers.

[3] Cf. Graziani, Rizzi 2015; Allaire et al. 2011; Marsden 2013; Symbola 2015; Azadi et al. 2011; Marsden, Sonnino 2012.

[4] Cf. OECD 2001; Camagni, Capello2013.

[5] Cf. Simonelli, Zurlo 2004.

[6] Cf. Anholt 2007; Dioli, Rizzi 2010; Morgan et al. 2007.

[7] Cf. among the most recent Cf. Piccinno, Triunveri 2004; Marano 2004; Trapani 2004; Castelli, Vignati, Villari 2005; Cristallo, Guida, Morone, Parente 2006; De Giorgi, Germak 2006; Campagnaro, Lupo 2009; Villari 2012; Villari 2013).

[8] Cf. Manzini 2005; Manzini 2015.

[9] Cf. Krueger 1983.

[10] Cf. Milgram, Kishino 1994.

[11] Cf. Lanier 1992.

[12] Smart Specialisation Strategy is a place-based approach characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement. It is outward-looking and embraces a broad view of innovation including but certainly not limited to technology-driven approaches, supported by effective monitoring mechanisms.

[13] The images accompanying the text are taken from the work of two famous artists from the Marche region. Mario Giacomelli's photographs and Tullio Pericoli's drawings are evidence of the connection to their land of origin. They give us an abstract image made up of lines, scratches and textures that become signs and symbols of a language capable to speak about the landscape of Marche region.

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Cultural Heritage is as rich as complex and its documentation is an increasing challenge. The digital solutions are numerous and their potential is a topic of constant investigation by the scientific community, that is requested to deliver digital strategies to make heritage permanently open and shared. The volume collects the contributions to the second conference of the 'Digital & Documentation' series, extending the debate to a multidisciplinary network of experts. It presents a frame of strategies for the documentation of Cultural Heritage in a wider perspective, stimulating reflections on: the relationships between physical and digital assets; the consistence of digital data and its management; digital representation as a mean to the transfer of cultural heritage. It comprehends theoretical studies and best practices on tangible and intangible heritage, taking into account applications for the research and the communications of Cultural Heritage as 3D representations, digital anastylosis, Augmented and Virtual Reality, Artificial Intelligence, semantics and databases. Aiming to give a comprehensive view on digital and documentation, the volume involves multiple perspectives from cultural institutions and universities, from experts in representation, geomatics, history, architecture, archaeology and ICTs for a multidisciplinary outcome.