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# Creating Digital Culture by digitizing Cultural Heritage: the Crowddreaming living lab method

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## Abstract

This paper[1] outlines the current progress in the development of an innovative living lab methodology named *The Art of Crowddreaming*. The Stati Generali dell'Innovazione (SGI) together with the Digital Cultural Heritage, Arts & Humanities School (DiCultHer) – an interdisciplinary network of over 70 Italian organizations including universities, research entities, cultural institutions and associations – has designed and defined such methodology since 2016, testing models to build soft skills required to co-create, manage, preserve and safeguard digital cultural heritage. The methodology has been proven to be able to engage innovators, researchers, youth of schools of any grade and other societal actors as a community in the challenge to invent, co-design and build prototypes of cross-generational digital cultural heritage applying the innovative *Digital Cultural Monuments* process. The experimentation of the methodology is illustrated by means of two case studies of *Museater* collaborative creation. *Quintana 4D* engaged students of schools of any grade in the City of Foligno in an trans-disciplinary effort to design, expand and manage the Museater of the Joust of Quintana. *Heritellers* engaged students of "F. De Sanctis" high school for classical studies in the City of Trani in the making of "CastleTrApp", a digital storytelling app and a Museater performance about the famous Swabian Castle of their City.

1 Nicola Barbuti, Giuliano De Felice and Paolo Russo edited the paragraphs *The Three Challenges of the Digital Age; The Crowddreaming Methodology*; Annalisa Di Zanni and Altheo Valentini edited the paragraph *The Art of Crowddreaming Success Stories*.

Il contributo presenta gli esiti della sperimentazione di un'innovativa metodologia formativa living lab, denominata The Art of Crowddreaming. Progettata nel 2016 dagli Stati Generali dell'Innovazione (SGI) in collaborazione con la Digital Cultural Heritage, Arts & Humanities School (DiCultHer) – una rete interdisciplinare di oltre 70 organizzazioni italiane tra cui università, enti di ricerca, istituzioni culturali e associazioni, essa prevede lo sviluppo di modelli formativi innovativi finalizzati a costruire le conoscenze e competenze trasversali necessarie per co-creare, gestire, preservare e salvaguardare il nuovo patrimonio culturale digitale. The Art of Crowddreaming coinvolge innovatori, ricercatori, studenti delle scuole di ogni ordine e grado e altri attori della società in comunità impegnate nella sfida di inventare, co-progettare e creare i Monumenti Culturali Digitali (MCD), prototipi di patrimonio culturale digitale intergenerazionale. La metodologia è stata sperimentata in diversi casi di studio. Nel presente lavoro se ne presentano due che hanno avuto come obiettivo la creazione collaborativa di Museater, uno dei modelli di MCD. Quintana 4D ha coinvolto gli studenti delle scuole di ogni grado di Foligno, in Umbria, nello sforzo transdisciplinare per progettare, ampliare e gestire il Museater della Giostra della Quintana. Heritellers ha visto gli studenti del Liceo Classico "De Sanctis" di Trani, in Puglia, impegnarsi nella realizzazione di CastleTrApp, un'applicazione con digital storytelling e performance museatrale incentrati sul Castello Svevo della loro città.

## The *Three Challenges* of the Digital Age

The contemporary generations are the first to face the contemporary first-rate challenge for world history: to pass on digital culture. It is still today a titanic undertaking, because the survival of our contemporary culture depends on this challenge.[2] Although the ongoing *Digital Age* has only few years behind it and it is premature to analyze this deep transformation from a sound historical perspective, we know that a lot of contemporary culture yet has already gone into oblivion with the cancellation of e-mails, images and database for the most disparate reasons: from simple unawareness to the failure of the companies that managed such data.

Together with the Digital Revolution, several critical issues arise, that we summarize in the following questions: are today's communities aware of the importance of digital culture? Are the cultural, societal, educational and training systems adequate to provide people, and above all youth with the knowledge needed to face the digital evolution, whose nature is still obscure in many ways but people have to manage its rapid transformations?

In order to address these issues, in 2015 some researchers and innovators of the Italian Association Stati Generali dell'Innovazione (SGI) and of the Digital Cultural Heritage Arts & Humanities School (DiCultHer) network[3] started a deep analysis on the state-of-the-art of the digitization and of the digital creation knowledge among youth generations.

2 The last topic of EU Horizon2020 clearly shows this challenge: cfr. https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/dt-transformations-12-2018-2020

3 The DiCultHer network links over 70 Italian organizations including universities, research entities, cultural institutions and associations <https://www.diculther.it/>.

As first result, they have identified three crucial *Conceptual Challenges* whose knowledge appears to be basic for addressing the issues of the *Digital Age* ([12]).[4]

## The *Conceptual Challenge of Space* (or *Form Challenge*)[5]

This *Challenge* is deeply relevant to digital societies, because if digital creations do not undergo the spatial constraints of analogic creations, the possible consequences have been minimally explored up to day: "The digital dimension of reality can be imagined as an infinite planet ready to welcome human life, but it is still like a terraform.[6] It is an exciting development opportunity in every field, but it should be exploited wisely since it is not for free".

We can apply analogous reasoning to a special point of interest, the frontier line where digital and objective constructs meet: "The potential of Spatial Computing (or Augmented Reality or Mixed Reality, however one prefers to call this discipline) is still to be discovered and an effective 'native' narrative language has yet to be invented. Again, the new generations have the rare privilege of literally being in the condition of inventing their own world. However, the exponential growth of human capacity to easily modify the surrounding environment requires the development of a 'digital consciousness' that is largely absent today".

This is a first-rate issue to solve for addressing the *Digital Age*, because, as even the TCP/IP creator Vinton Cerf pointed out yet in 2012,[7] we must be aware that: "the digital dimension of reality behaves like a black hole that continues to absorb processes at ever-increasing speed as it increases its mass, without viable operating alternatives in case of system failure. A far from an unlikely failure".

## The *Conceptual Challenge of Time* (or *of Impermanence*)[8]

This *Challenge* starts with the assumption that, what digital artifact gains over spatial constraints, it loses over temporal constraints: "The threats to the survival of a digital artifact are many: the corruption of the medium due to external causes of any kind, that also include human error, the extinction of the person or the organization in charge of supporting the costs for maintenance of digital collections", as well as the problems related to the nature of the digitization, among them: the obsolescence of the hardware, of the software, or of the digital

4 A broad exposition of the topics summarized in this paragraph is in: https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/

5 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm/the-digital-challenges-and-the-second-crisis-of-the-analytical-paradigm/the-conceptual-challenge-of-space

6 https://en.wikipedia.org/wiki/Terraform_(software)

7 https://www.theguardian.com/technology/2015/feb/13/google-boss-warns-forgotten-century-email-photos-vint-cerf

8 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm/the-digital-challenges-and-the-second-crisis-of-the-analytical-paradigm/the-conceptual-challenge-of-time

formats used.

Who intend to pass down digital cultural content must ensure that it still will have meaning and value for future users.

The following main reflection related to the creation and transmission of digital culture arises from the Challenge of Time: "the transmission of culture by digital means is a very delicate and complex process that does not tolerate the slightest discontinuity".

## The *Conceptual Challenge of Speed* (or *of Change*)[9]

This Challenge is linked to remarkable acceleration that the *Digital Transformation* has given to the processes of change at all levels of human society: "New discoveries, new products, new ideas, new stories are produced at an almost daily pace thanks to the extreme ease of access to instant communication for anyone".

The exponential growth of the complexity of the systems due to the speed of the transformations requires the availability of an increasingly high number of highly qualified and aware experts. Assuming that the ongoing efforts to achieve this goal will be successful, the time of obsolescence of a large amount of knowledge and skills is a problem, because now it is measured in months/year and no more in decades or centuries.

## The *Crowddreaming* methodology

The need to manage this quick change arose by the above theoretical reflection. We can no longer rely for our processes on the Analytical Paradigm[10] we have been used to for centuries. We need to research for new both training and operational framework to complete the cycle of knowledge creation and transfer in the shorter time we can. We need a new paradigm to reach this goal and to define an innovative conceptual model.

Several attempts to define paradigms different from the Analytical one have been drafted in the last years. Research is still in an exploratory phase, but we have taken up some working hypotheses in order to outline a new paradigm and to test it on the field.

A model based on the *stigmergic* principle, which is recognized in numerous self-organized

9 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm/the-digital-challenges-and-the-second-crisis-of-the-analytical-paradigm/the-conceptual-challenge-of-speed

10 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm/the-first-crisis-of-the-analytical-paradigm ; https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm/the-digital-challenges-and-the-second-crisis-of-the-analytical-paradigm. For bibliographic references on Analytical Paradigm and its use in scientific research fields, see: https://scholar.google.it/scholar?q=%22the+analytical+paradigm%22&hl=it&as_sdt=0&as_vis=1&oi=scholart

systems in nature, seemed interesting and promising to experiment.[11]

*Stigmergy* is defined in Wikipedia as follows: "a consensus mechanism for the indirect coordination of agents through environmental stimuli. It produces complex and apparently intelligent structures without requiring planning, control or even direct communication between agents".[12]

Inspired by this system, we assumed a paradigm that postulates a complex system of expected desirable results and balanced set of stimuli, without having to analyze its internal composition and the relationships between its components. This abstract formulation needed a process for applying it to the creation and transmission of digital culture.

## The *Digital Cultural Monument* process

One of the greatest limitations of the digital transformation is that media or supports for guaranteeing the preservation of digital memory for more than a few years miss: to create a digital monument in these conditions seems impossible. You must think of Stonehenge or of giants of Easter Island. We feel them as monuments because of their *grandeur*, but their meaning and their stories are lost. It's like they are a huge, demagnetized hard drive. Therefore, the main problem related to digital culture is not how building hardware that lasts for centuries, but to devise a digital process that guarantees the transfer of stories and of their memory to several generations and centuries.

In order to solve this issue, we designed the conceptual and experimental *Digital Cultural Monument* (DCM) creative process.[13] It changes the concept of *monument* giving answers to the issues related to the above outlined three digital *Conceptual Challenges*.

In fact, unlike the traditional one a digital monument is not an object: it is a process in perpetual evolution, a narrative that evolves over time turning on itself into a sustainable ecosystem through tokenization mechanisms in curatorial markets. Its raw material is digital and it needs 2D and 3D instruments – especially digitization and AR technologies – for creating digital artifacts.

We think the DCM process as intergenerational. It is designed and created around a *D.REA.M. - Digital REAlity Meme*, a significant concept in digital cultural creation because it easily propagates from subject to subject, following the apparently erratic movement of a *C.A.T. – Community Augmented Tale*. Each *D.REA.M.* develops multiple *C.A.Ts.* that change and enrich themselves. These become the leading actor of a DCM process when a digital curator, mentor,

11 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm-and-the-digital-monument-conceptual-framework

12 https://en.wikipedia.org/wiki/Stigmergy. Here there is an updated scientific bibliography about the evolution and use of stigmergic principle.

13 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/the-stigmergic-paradigm-and-the-digital-monument-conceptual-framework

artist, *genius loci* makes them usable and organizes their transmission to subsequent generations. We name this human resource *Generational Host* or *G.Host*. Of course, nothing prevents a single D.REA.M. is passed down to other G.Host. Developing this concept, the circle is closed and, by imagining several DCM processes connected to each other, we create a meta-monument of digital collaborative design.

## The *Crowddreaming* conceptual model

The *Crowddreaming a Digital Monument* conceptual model was conceived in 2016 by the DiCultHer and SGI researchers and innovators. The *Crowddreaming* neologism appeared for the first time in December 2016, in the title of the first edition of the national contest for the Italian schools of any grade *Crowddreaming: Youth co-create digital culture.*[14] The challenge idea of the contest was focused on offering youth the uncommon opportunity to gain digital experience working on co-creation, curation and dissemination of digital cultural contents side by side with experts, professionals, and established researchers.

From the first edition of *Crowddreaming*, in 2017 came up the *Crowddreaming Hackademy,*[15] an online interactive platform open to all people who are interested in exploring the digital frontier of the transmission of cultural heritage. Then, two other contest have been run up to 2018, reaching out to 300 schools and over 4,500 students of schools of any grade and leading also to the creation of a small community of teachers.[16]

These experimentations gave positive feedback, bringing the researchers of DiCultHer and SGI to decide to run a recursive prototyping effort in order to transform this successful practice into a *living lab* methodology. To draft it they inspired to the *Theory U* developed from MIT Presencing Institute, and by the *educational constructivist* practical theory ([16]), oriented towards problem-solving and involving young people in projects relevant to them.

## The MIT *Theory U* for changing management[17]

The Presencing Institute was founded in 2006 by MIT Otto Scharmer, Senior Lecturer at Sloan School of Management, "*to create an action research platform at the intersection of science, consciousness, and profound social change*". Scharmer defines the *presencing* concept as a word that blends *presence* and *sensing* to signify "*a heightened state of attention that allows individuals and groups to shift the inner place from which they function*".

Basing on this concept, in 2008 he developed the *Theory U,* a theory and practice process for managing the change brought by digital transformation ([13]; [14]).

14 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/
15 https://museater.com/crha/
16 https://www.diculther.it/crowddreaming2018/
17 https://www.presencing.org/assets/images/theory-u/Theory_U_Exec_Summary.pdf

The process is based on five movements:

1. *Co-initiating: Build Common Intent*
2. Co-sensing: Observe, Observe, Observe
3. *Presencing: Connect to the Sources of Inspirations*
4. Co-creating: Prototype the New
5. *Co-evolving: Embody the New in Ecosystem*.

Scharmer explained the reference to *U*: "*I have come to refer to as the U process because it can be depicted and understood as a U-shaped journey*", and depicted the five movements of the U journey in the following figure:

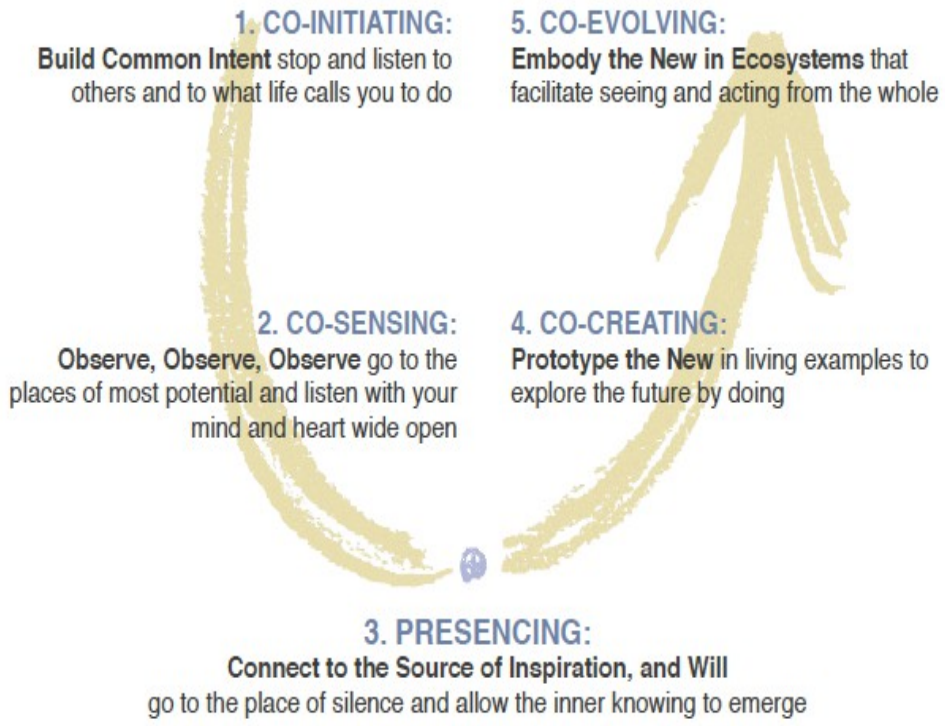


Figure 1: The Theory U Process five movements.

He claims that the journey through the *U* develops seven essential leadership capacities:

1. *Holding the Space of Listening*: listening it is the foundational capacity of the U; "effective listening requires the creation of open space in which others can contribute

to the whole".

2. *Observing*: the suspending of the "voice of judgment" "is key to moving from projection to focused and peripheral observation".
3. *Sensing*: "The preparation for the experience at the bottom of the U requires the tuning of three inner instruments: the open mind, the open heart, and the open will. This opening process is an active "sensing" together as a group. While an open heart allows us to see a situation from the current whole, the open will enables us to begin to sense from the whole that is wanting to emerge".
4. *Presencing*: it is "the capacity to connect to the deepest sources of self […] where knowing comes to surface".
5. *Crystallizing*: "when a small group of change makers commits itself to shared purpose, the power of their intention creates an energy field that attracts people, opportunities, and resources that make things happen".
6. *Prototyping*: moving down the left side of the U to its up right side "requires integration of thinking, feeling, and in the context of practical applications and learning by doing".
7. *Co-Evolving*: organizations need "to convene the right sets of players in order to help them to co-sensing and co-create at the scale of the whole".

The process design is constantly developing as it provides tentative answers to the ever-changing Digital Age challenges.

Although the Theory is based on universal principles, the language adopted betrays its origins in the business sector of research. Bringing it to the world of school and, above all, to very young students has been the first-rate research challenge of the overall *Crowddreaming* experience.

## *The Art of Crowddreaming* living lab approach

Starting by the above instance of the *Theory U*, the innovative *living lab* approach[18] ([9]; [10]; [7]; [17]) to collaborative creation of digital cultural heritage named *The Art of Crowddreaming*[19] was co-designed and developed.

This approach proceeds to simplify and to hide the *Theory U* language in order to implement an innovative process of co-creating digital cultural heritage. Among the many tools in the *Theory U* toolbox, the *coaching circles* have been chosen because they are immediately adaptable to school and youth reality in general. Their highly structured context makes it easy to offer them both to guys and to teachers.

18 https://www.ilgiornaledellarte.com/arteimprese/articoli/2014/9/120694.html

19 https://paolorusso.gitbook.io/the-art-of-crowddreaming-handbook/building-a-digital-monument/the-art-of-crowddreaming

The conceptual assumption of *The Art of Crowddreaming* relies upon the awareness that any kind of mind is intelligent because it is capable of dreaming. This is true for the connective minds of digital age too.

It is a discipline that trains a connective intelligence to lucid dream. There are three critical transitions in its process: a *crowddream* comes to life usually as an individual **insight,** that becomes a clear **intent** by way of interacting with one's social circles. Then, it becomes a compelling **story** about a desirable future that is able to capture the imagination of a big enough crowd so to make it happen. Finally, it evolves into a well-designed innovation **project** that can shape the shared dream into reality.

The first transition corresponds to the deep listening phase on the left side of the *U* process, while the second and third transitions are placed in the right wing of the *U*, when a prototype has been created.

*The Art of Crowddreaming* educates to manage the process by using methods and language of Hollywood blockbuster productions instead of the academic leadership-oriented vocabulary of *Theory U*. Such narrative choice makes the concept more accessible to everyone and the prototyping phase way more appealing to students: they are fascinated by the idea of learning how to produce a blockbuster movie.

The starting point of the living lab process is a quite obvious statement: every project that achieved its goal has a success story to tell. Proceeding backwards from the socially desirable future of the happy ending, innovators, researchers and societal actors co-create the plot with all of its characters, relationships, places, props (resources), events, subplots that had to be there.

Dramatic theory and movie production management knowledge provide highly professional and perfectly honed tools to develop a story from the original insight to its final staging in the real world. They not only force to identify all the necessary human, financial, material and time resources, but they oblige to explore also the emotional, ethical and human dimension, which is often overlooked with purely analytical and numerical approaches to project management.

## The *Museater* method for collaborative creation of digital cultural heritage

The *Crowddreaming a Digital Monument* framework facilitates the set up of several art-of-crowddreaming-based experiences focused on the development of the soft skills required to co-create, manage, preserve and safeguard digital cultural heritage.

Based on the constructivist approach of project-based learning, teachers, students and societal actors have been challenged to *crowddream* digital stories about a relevant topic regarding their cultural identity. The stories have to be able to travel in time through many future generations. The overall goal is to encourage both teachers and young people to get ready to face the

epochal challenge to which the new generations are called: they are the first ones in the history of humankind to find themselves passing down a purely digital cultural heritage.

The young involved in the experimentation were challenged to apply the DCM process in order to create the so-called *Museater* ([11]).[20] This is an innovative collaborative creation of digital cultural experiences that worked successfully for the first time in 2014 for the *Treasures & Tales* art exhibition in Wilmington (DE, USA) ([1]). Conceptually, it hybridizes museum, theater and digital research lab methodologies.

Unlike museums that are realized to preserve collection of artifacts, the Museater aims to preserve the outputs of the DCM collaborative process, not objects. This is exactly what the DCM framework aims at, because in the reality of the digital dimension processes are substance.

So, conceptually the Museater can be defined as follows: "A Museater is an institution that take care, enhance and preserves the process of digitization and collaborative creation of digital artifacts and collection of stories of scientific, artistic, cultural or historical interest, helps people to discover them in contexts where their educational and emotional impact is maximized, and facilitates their re-use and their diffusion".

We intend it as an intergenerational creation, whose starting point is the assumption that a story – or a collection of stories – lives as long as there are communities that remember it because it is meaningful for themselves.

The collaborative creation process is based on redesigning and making accessible a still empty digital space. This space needs someone who transforms it into a place where people can live part of their life, preserve digital memories about cultural exchanges and, at the same time, they are encouraged to act and interact. Young people involved in *Crowddreaming* experimentation dared to take this empty digital space and make it beautiful and meaningful, becoming responsible for this digital dimension of reality. Led by a facilitator, they created the success story of their "dream" museum.

Following the analogy with theater, even a Museater needs products and services to support the staging: sets and costumes, workshops to produce them, warehouses to preserve them and allow them to be reused for subsequent performances.

In practice, it is a digital service system consisting of:

- Archive of digital props (video clips, audio clips, music tracks, images, comics, holograms, texts, 360 ° videos, 3D reconstructions, etc.), scientifically classified according to the criteria suggested by the Istituto Centrale per il Catalogo Unico, the Istituto Centrale per il Catalogo e la Documentazione and from the Istituto Centrale per i Beni Sonori e Audiovisivi. The materials are acquired and archived so as to make them easily usable for creating Augmented Reality apps. The description of the contents is realized through datasets that allow their re-listing through the systems for the management of cultural Open Data. The archive is maintained on easily accessible

20 https://technical.ly/delaware/2014/10/09/special-exhibit-wilmington-offers-italian-art-seen-apps/

and highly reliable and secure commercial cloud systems.

- Content Management System that guarantees content storage services, validation of the same and their metadata, interface with Open Data repertoires, API system for use by third parties. The main management system is available in the web environment, using open interfaces based on HTML5 / CSS / Javascript. Specific functions of acquisition from a mobile device are guaranteed through a dedicated app for the iOS and Android platforms.
- "4D Stage" app, app for iOS and Android that exemplifies the use of digital scenographies available in the CMS for a museum performance. The main purpose of the app is to offer a reference framework for the development of third-party applications. For this purpose the source code is made available under an Open Source license.

The Museater creative activities are as follows:

1. Project Management
2. Design
3. Production and classification of digital props
4. Development of the CMS
5. Development of the "4D Stage" app.

## *The Art of Crowddreaming* Success Stories

*The Art of Crowddreaming* method has already been tested practically at different levels of complexity in some projects, whose following synthetic description can be useful to better understand what we have written above.

### *The Quintana 4D*

The *Quintana 4D Museater Lab* (*Q4D*) revolves around the 70-year old *Giostra della Quintana* of the city of Foligno. The *Quintana* was born in 1946 as an ahead of its time social innovation experiment and worked so well that it became a tradition. The town had to recover from the deep wounds of civil war and the re-enactment of an historical joust held in 1613 was the perfect theme for a city-wide event that could help to forget contemporary political contrasts: cultural heritage belongs to everyone. The experiment worked so well that it became a tradition. Today the whole city is committed all-year round in the planning and delivery of two week events, in June and September, filled with Baroque-age-inspired cultural events, contests, a wonderful historical parade and, of course, the thrilling and very competitive final Joust.

In the past, kids and teenagers loved to be part of the celebration. Today, young people are

leaving the Quintana community at an unprecedented rate. The radically different nature of the Millennial's digital culture is the main reason of such disaffection: interviews showed that young people feel not the Quintana as an expression of their own digital culture.

The *Q4D Lab* aimed at transforming digitization from a menace into an opportunity to engage young people into the events in new and different ways, by involving them in Museater activities placed at the crossroad between digital technologies and local fascinating and rich cultural heritage.

A group of Millennials has been engaged to take an empty digital space over and to make it as beautiful and significant. They were called to *crowddream* and build an invisible city atop of the visible one. Brainstorming meetings guided by a facilitator let them create the success story of their Museater about Quintana. The project found its catalyst in a young woman who is now in charge of the *Q4D Museater Lab*. She quite literally dreamed and designed her own new (and first) digital-cultural-heritage-based job. She acted as tutor for apprenticeship programs with high schools, based upon project-based learning where students helped professionals in the process of planning the production of their success story and making the Lab a reality. The planning phase started using well-established Hollywood production tools and techniques to transform the story into a feasible project.

Almost every school in town contributes to Museater labs' activities. High schools sent students to develop applied digital skills (scripting stories, editing videos, designing digital baroque costumes, practicing as tour guides, digitizing 3D objects and buildings for virtual reality, creating AR experiences, optimizing energy consumption, etc.). Primary and infancy schools sent their students to have fun and learn at the Q4D Museater Labs. During 2017-2018 over 500 students have been involved in the project in different ways already. Every student involved knows his role in the production.

The *Ente Giostra della Quintana* provided space for the Museater, the *Centro Studi Città di Foligno* coordinated training activities for high-school students and provided qualified mentors and teachers. Other significant stakeholders began to support the project as it gained traction with young people: many local cultural associations, a non-profit theater company, a software development company, a social inclusion and digital innovation focused training company. All of them shared some time and knowledge with the student at the Labs, out of good will to benefit the community or because they understand that the new raising digital dimension will open new business opportunities. Students are stimulated to participate to co-creation of Museater's plays, to provide ideas for further developments and to point out educational needs to pursue their goals.

Today the Q4D Museater Lab is hosted at the beautiful palace Brunetti-Candiotti, a committed and ever-growing group of over 600 Millennials have been working as volunteers to haunt Foligno's streets and buildings with geo-located digital *Ghosts* (Figure 2). Moreover, the AR-enhanced experimental exhibition has become both the focus for educational activities of almost every school in Foligno and a destination for occasional visitors and guided tours with over 1,500 visitors in the first 9 months of its life. It is a small win-win ecosystem already, where young people feel that they do not need to find their place in society: they can build it

by exploring and shaping the digital dimension of their city.

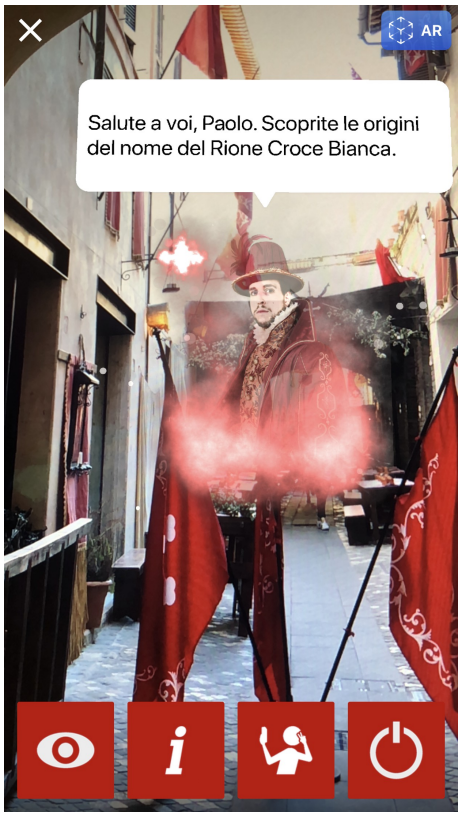

Figure 2: Quintana 4D app.

## The *CastleTrAPP* Success Story

The *Heritellers Lab* comes from the awareness of the engagement potential of the Swabian Castle of Trani, one of the most important monuments built by Emperor Federicus II.

In this project, the students of "F. De Sanctis" high school of Trani realized another way of *Museater Lab* by undertaking a number of initiatives (animated visits, recreational-didactic activities, creation of digital audio-video storytelling and swipe stories, etc.) that make the school a civic center, where they design together with- and for the territory activities that develop citizenship in the name of an identity inclusive idea. By this way, the goal of the project has been to promote a sense of cultural ownership and to provide students with a global vision of all aspects of cultural heritage (research, protection, management, use, production), fostering an approach oriented to communication and enhancement and opening up to the use of digital technologies for promoting and sharing cultural heritage.

Students were challenged to imagine the co-creation of a successful app to tell the Federicus II cultural innovation, guiding visitors to discover the true significance of the Swabian Castle of Trani. They were asked to plan all the activities required to create the success story of their Museater. Following the *living lab* methodology, they were asked to test their assumptions by undertaking the initiatives above mentioned.

The first year activities aimed at creating a *swipe story* about the Swabian Castle: an innovative digital multimedia storytelling which develops on an illustrated tape, animated and interactive on multiple levels, and uses a simple and immediate language based on drawings, images, words, games, sounds and movies. By this storytelling, a process of *cultural ownership* starts that makes both students aware and responsible custodians of cultural heritage inherited from the past, and creators of potential digital cultural heritage. The *swipe story* is entitled *CastleTrApp* and it is produced in Italian and English. It tells the most important historical phases of the Swabian Castle and can be downloaded by Google Play[21] and App Store[22] (Figure 3).

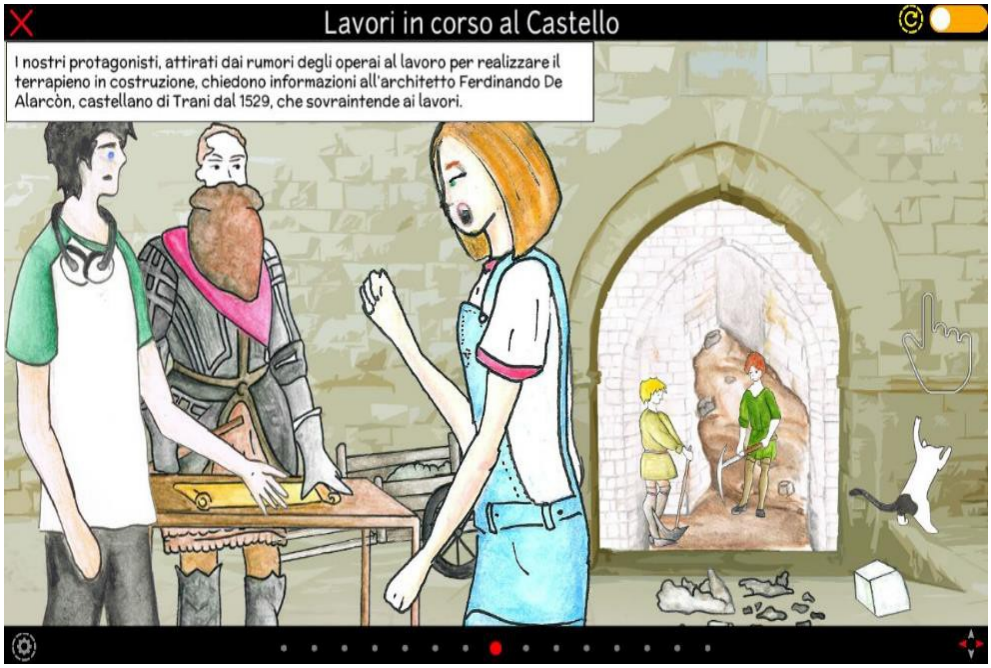

Figure 3: Graphic design for the Castle TrApp swipe story.

By retracing some of the transformations undergone over the centuries, the app allows the visit of the Castle using tools of digital storytelling. In a simple and fun way, a very large audience can explore the castle personalizing its experience, thanks to the different levels of depth of the proposed content, all scientifically validated.

Consistent with the theme of the project, in 2018 "De Sanctis" students involved about 340

21 https://play.google.com/store/apps/details?id=com.ia2.castleTrAPP
22 https://itunes.apple.com/it/app/castletrapp/id1296811891?mt=8

children of "Roncalli" primary school of Altamura, realizing an animated and playful visit of the Castle to discover the monument by reproducing the app storytelling. In the so-called "Sala Federico II" the designers of the app briefly explained the project to children. Other students, as guides, explained to children the mechanism of the game. During the visit, at a given signal the children closed their eyes and, reopening them, they found themselves in a Medioeval historical phase characterized by the "De Sanctis" students in *museater* way. From that moment the children visited the Castle rooms equipped with medieval furniture and populated by some costumed characters also reproduced in *the swipe story* of the app.

*Heritellers* project realized another kind of small win-win ecosystem, where young people feel that they do not have mandatorily to find their place in society since still kids.

## Conclusions

After 5 years of theoretical conceptualization and practical experimentation, the *Crowddreaming* methodology has been proven to be able to engage innovators, researchers, schools of any grade and other societal actors as a community in the challenge to invent, co-design and build prototypes of cross-generational digital monuments.

*The Art of Crowddreaming* is strongly oriented towards public engagement and it designed to stimulate the development of some of the key competences described in the lifelong learning European framework: digital competence; personal, social and learning competence; Civic competence; Cultural awareness and expression competence. Its innovative component resides mainly in its intent to insure a broader impact of *Theory U* by making its key practices and concepts more accessible to educators, youth workers, teenagers and kids by using familiar and engaging tools borrowed by movie's industry rather than the original quite philosophical and academic language.

The case studies presented in this paper are the first iterations of the prototyping process and show that this methodology works and it is adaptable to very different scales: from a single school class to a whole community.

From 2019 *Crowddreaming* is also a European ERASMUS+ KA3 Project today still ongoing.[23]

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