

# “Matera: tales of a city” project: an original multiplatform guide on mobile devices

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## Abstract

*Matera città Narrata is a project coordinated by CNR ITABC and financed by the Agency of Tourist Promotion of Basilicata region, aimed at the creation of a digital platform able to support the public before and during the visit of Matera (World Heritage since 1993), providing cultural contents by multiple communicative formats and access possibilities. The main components of the project are: 1) the web site, accessible in remote and adapted also from smartphone, 2) cultural contents and applications for mobile devices (old style mobile phone, smartphone, iPad) with different operative systems. Every user can reach cultural contents in a simple way, choosing the communicative format he prefers and supported by the technology he owns. In this paper we'll describe, more in detail, the applications developed.*

**Keywords:** MULTIMEDIA GUIDE, MOBILE TECHNOLOGIES, MULTIPLATFORM SYSTEM, STORYTELLING, USABILITY, INCLUSIVITY, 3D RECONSTRUCTIONS.

## Resumen

*Matera città Narrata es un proyecto coordinado por el CNR ITABC y financiado por la Agencia de Promoción Turística de la región de Basilicata, dirigido a la creación de una plataforma digital capaz de guiar al público antes y durante la visita a la ciudad de Matera (Patrimonio de la Humanidad desde 1993), proporcionando contenidos culturales en múltiples formatos de comunicación y posibilidades de acceso. Los componentes principales del proyecto son el primer lugar el sitio web, accesible y adaptado también a smartphone, y, en segundo término los contenidos culturales y las aplicaciones para dispositivos móviles (teléfono móvil convencional, smartphone, iPad) con diferentes sistemas operativos. Cada usuario puede llegar a los contenidos culturales de una manera sencilla, elegir el formato de comunicación que prefiera en función de la tecnología que posee. En este artículo se describen, más en detalle, las aplicaciones desarrolladas.*

**Palabras clave:** GUÍA MULTIMEDIA, TECNOLOGÍAS MÓVILES, SISTEMA MULTIPLATAFORMA, NARRACIÓN, USABILIDAD, INCLUSIÓN, RECONSTRUCCIONES 3D.

## 1. Matera, an uninterrupted continuity

“Matera: città narrata” (Matera: Tales of a City) is a project developed by the ITABC – CNR in collaboration with public and private organizations and supported by APT Basilicata (the tourist agency for regional promotion).

Matera (World Heritage since 1993), is an extraordinary place in South Italy, where the human presence can be perceived in its uninterrupted continuity best than everywhere, from 12.000 years ago until today. The morphology of the environment characterized by thousands of natural caves, allowed men and women to be hosted and protected (LAUREANO, 1993), developing very particular kind of civilization in accordance with the rupestrian habitat. Matera seems an enormous sculpture excavated in the rock, the symbiosis between nature and urban environment is total. The city has gained international fame for its ancient town, the "Sassi", houses dug into the calcareous rock, which is characteristic of Basilicata and Puglia. Many of these "houses" are really only caverns, and the streets in some parts of the Sassi often are located on the rooftops of other houses. The ancient town grew in height on one slope of the “Gravina”, a canyon created by a river that is now a small stream. Because of the very bad condition of life, in the 1950s, the Italian government forcefully relocated most of the

population of the Sassi to areas of the developing modern city. Until the late 1980s this was considered an area of poverty, since these houses were, and in many areas still are, mostly unlivable. Current local administration, however, has become more tourism-oriented, and has promoted the re-generation of the Sassi with the aid of the European Union, the government, UNESCO, and cinema industries (as many famous movies were realized in this scenario, from Pasolini to Mel Gibson). Now many Sassi have been restored and re-occupied for touristic and craft activities or for living.

## 2. Matera tales of a city project: aims and target

The overall objective of the project is the realization of an integrated, multidisciplinary and multidimensional network of virtual heritage that connects ideally, places, times, authors, users, the real world and virtual dimensions. The main target of the project are tourists and occasional visitors. Today the visit of Matera is usually included in wider package tours (from the Adriatic and Ionic coasts) and generally people visiting this place remain just few hours or one day, an insufficient time to be able to enjoy and understand the place and its extraordinary cultural heritage. Given this situation, the final purpose of the project is

to encourage tourists and families to spend a longer time in the town and in its territory through an improved cultural offer.

The general design of the system, the organization of cultural contents, the choice of itineraries, sites, communicative formats were prepared by an accurate and fundamental monitoring activity of tourists' preference, provenance, alphabetization and condition.

The core of the work consists in a digital platform containing multimedia, virtual reality, storytelling contents aimed to support the cultural experience of people who are visiting the town or are going to. Such contents, living in a website, can be accessed through your mobile device (cell phone, smart phone, computer) using the phone network or a wi-fi connection. The communicative approach is completely differently from traditional guides. In fact it does not describe or inspect monuments just mentioning who made them and when; it tells the stories that took place in ancient sites, real fragments of life, myths, characters, memories. The system thus consists of two parts and two modes of use in order to simplify and promote maximum access and use:

- the multimedia website
- the material for portable systems (telephone, smartphone, devices, laptop, tablet..) with different Operative systems.

The technology is used to the minimum necessary for the purposes to be achieved and in the simplest version available for the various functionalities, according to the user's need and abilities; cultural content and services are given for free.

Images, sounds, 3D reconstructions, movies concerning a specific historical site rather than gastronomy or local crafts, try to involve the user in an emotional dimension. The web site has a vital role, both for the preliminary planning of the visit and during the visit itself.

The web site (<http://www.materacittanarrata.it>) has been developed in Flash but with a back-end structure allowing people with proper rights to add new contents or new graphic items very quickly and simply. On the site the user can explore itineraries, sites, personal stories, 3d reconstructions of the city and its landscape through nine different chronological phases; he can also download content to his phone or laptop (.pdf documents, movies, .mp3 audio files, applications), useful during the successive visit to the sites.

The web site has been developed also in HTML and declined also to be accesses from smartphone.

From the begin a fundamental issue of the project has been the "transparency" of the technological infrastructure: solidity and stability of the system are a "must" but also facility for public to use technology and to access to cultural contents. These ones can automatically fit to personal mobile devices (technological profiling), in order to include, as potential target, all the categories of people.

The contents can be accesses in several ways.

The "Database" Mode is optimal while moving through the site: the visitor stops in front of a monument and finds a sign with its name and ID, together with an internet website and a toll free number. He has many possibilities. If he can connect to the internet (the place is in a wi-fi area or he uses his own charges profile) he can access to the web site and, keying in the ID, he reaches information about the monument and other related contents (fig.1).



Figure 1: *matera città narrata web site for smartphone*

He can also download a stand alone application if he owns a smartphone, in order to avoid to connect to the internet in the successive steps of the visit.

On the contrary, if he has not the internet connection, he can call the toll free number indicated on the sign. In this case a synthetic voice (IVR, Interactive Voice Response) will answer asking to choose the preferred language (Italian, English, German); after it will ask the monument ID and finally if the user's preference is for an audio guide (2-3 minutes) or an MMS (multimedia message, 30-40 seconds and 5 images). After this third choice the proper content will be sent.

The "Guide" Mode is optimal when the user accesses the website from home, school or every other static base and he finds cultural contents organized in thematic itineraries or more structured sections; he can explore or download them in different formats in order to use these materials while the real visit of Matera.

## 2. Contents

In the following part of the paragraph we are going to explain the main sections of the application.

### *Fly on the territory:*

This section aims to the real time 3D exploration of the territory all around Matera. It is an "holistic" vision of the context where the user has the possibility to visualize and locate the main typologies of cultural heritage present in the area (fig. 2).

In fact the rupestrian civilization is not only referred to the central historical neighborhoods of the town but also to the territory of the Rupestrian Churches Park all around, including thousands of prehistorical, neolithic, medieval sites (FONSECA, 1978). The 3D reconstruction of the context is based on a GIS project, where all the data are geo-referred and integrated. The DEM was generated from topographical surveys with different resolutions: 1:10.000, 1:2.000, 1:500 (thanks to Ufficio Sassi of Matera) and its final resolution is 2 mt, to be managed with many LODs (level of details) because for the real time visualization in iPad 1<sup>st</sup> generation we need to limit the

calculation to 20-25.000 polygons. The 3D geometry, divided in many tiles according to the level of detail adopted, was mapped with Quickbird satellite photos (80 cm resolution), and with an IGM map where it is easier to locate and identify all the topographical themes. The virtual exploration is controlled by a very particular third person camera: moving and tipping the iPad the user must guide a Lesser Kestrel (a typical little hawk living of Basilicata) flying all over the territory; it can lose or gain altitude and speed, turn left and right acting the proper animations. Even if the user decides the direction to apply to his movement, the bird keeps a certain degree of autonomy. The camera has not a rigid constrain and a fixed distance from the avatar-hawk but a flexible behavior and this solution produces a very nice effect.



Figure 2. iPad application: real time exploration of the territory

The user can modify the textures of the territory choosing the map or the satellite image, he can also visualize some thematic layers, as 3D icons located on the landscape: prehistorical sites, rupestrian churches, shepherd's settlements, manor farms, new urban quarters, towns near Matera and so on. Some of these icons are interactive and let the user access to more detailed information about specific sites.

The GiS project integrates also data connected with the reconstruction of the potential ancient landscape of Matera (FORTE, 2008) (vegetation and soils maps, geological and paleobotanic data, thanks to the Park authority and HSH company) that we propose in another section of the application.

#### **Guide:**

As mentioned before our goal wasn't to create a guide following the traditional descriptive approach of monuments and sites. The places we meet are occasions to tell stories, fragments of real life, memories, events, legends, through the voices of characters lived in different times – counts, knights, saints, governors, chroniclers, historians, archaeologists, artists, farmers, abbesses - and following a progression where many cultures and building techniques meet and cross each other. Each place/story is told through a slide-show and an audio comment, a not heavy format in terms of resources but efficacious from a communicative point of view (if the user is in front of the real place he doesn't need an oversized multimedia format). The sites can be accessed directly from a map or following thematic itineraries (there are four, two in the *Sassi* neighborhood, one up to the *Civita* and one in the territory outside Matera, along the Gravina).

#### **The passing of the time:**

The section is dedicated to the evolution of the landscape and of the urban context of Matera through the time. This evolution process is described and shown through video clips based on 3D rendering showing the context in eight different ages: the emersion of lands from the sea more than two million years ago (TROPEANO, 2003), the terrain and “gravina” formation, the birth of the first Neolithic entrenched settlements (5000-4000 b.C.), the diffusion of the life in the caves, the construction of the “built” and fortified space in the Middle Ages, the expansion from the *Civitas* to *Sassi* suburbs, from *Sassi* to the planar area where the modern and contemporary city developed (GATTINI, 1882; VOLPE, 1818; FONSECA, DEMETRIO, GUADAGNO, 1999; DEMETRIO, 2009). The 3D rendering are supported and combined with historical documentation, iconography, literary citations; a critical info-graphic apparatus was also elaborated in order to highlight, on the actual images of the town, the interpretation process followed and the correspondences between the 3D reconstructions of the past and what is still visible today.

#### **Views through the time:**

The 3D reconstructions of the past chronological phases have been used in this section in order to create an experience of “augmented reality” (GIBSON, 1979; FORTE, 2008; CAMERON & KENDERDINE, 2007).

The *views through the time*, in fact, are views on the urban and/or natural urban landscape that can be observed in their process of historical evolution and transformation. Six main views (indicated on the map with orange icons) are panoramas in 3D reconstructed in eight chronological phases, from 2 million years ago until today. In each of them the actual image and the 3D reconstructions of the past are perfectly overlapping and it is possible to perceive and understand the whole chronological progression. A cursor allows to modify the transparency of the levels in order to have more possibilities of comparisons and analysis (fig. 3a - 3b).

Other views consist in historical images taken inside the *Sassi* areas (blue icons on the map, fig.4). Every couple of images shows the life and the places before and after the depopulation of 1950s or their successive restoration (fig. 5)

#### **Witnesses:**

Many people living in Matera supported our project: they described places and events in the light of their memories, encounters, visions, works, life experiences. The space become place: a new identity emerges, a new “speaking” portrait of the town, after that one, very famous, by Carlo Levi, “Lucania 1961”, today preserved in the National Museum of Medieval and Modern Art in Palazzo Lanfranchi. In our application these witnesses are fixed in video clips, each one two- three minutes long.

### **3. Conclusions**

The project introduces a new approach in the re-qualification and valorisation of the cultural landscape of Matera (archaeological, historical, artistic, natural contexts), focusing not only on the most important sites but on the diffused cultural heritage. The main idea is to provide people a system able to support the visit experience before it begins and while it is in

progress through a variety of communicative formats. These contents are resident in a web site and can be accessed also through many kinds of mobile device with different operative systems, using a free wi-fi (the wi-fi hardware infrastructure has been created within the project in the historical centre of the city) or a telephone connection. We didn't want to confuse the instruments (new technologies subjected to fast obsolescence) with the final purpose: cultural dissemination, innovative models for the Cultural heritage fruition. For this reason we decided to invest mainly on the capitalization of the intangible heritage, in order to strengthen the unicity of this territory.



Figure 3a – 3b.: Interactive panorama, from the “Belvedere della Murgia”: the first image refers to the end of the IXX century, the second one to the Neolithic age (5000-4000 B.C.). Ipad application developed in Unity 3D.

For the first time Matera and its evolution through the time has been represented in 3D thanks to an imposing work of data collection, interpretative study and computer graphic. The 3D reconstruction of the context enables to appreciate the town in a wide visual field. Our goal was to give the idea of Matera as a unitary object and not as a combination of different particles. We wanted to represent the town as a unique body, evolving stage by stage (fig. 6).

The project has been concluded from a technical point of view and the applications are already available in the web. The evaluation on public is in



Figure 4. The interactive map with the views through the time indicated with orange and blue icons.



Figure 5. Historical photos taken from the same point of view, showing people living inside the Sassi neighbourhoods before 1950s and the same place after the depopulation.

### Progress.



Figure 6. Virtual reconstruction of Matera during the Renaissance, realized in 3D Studio Max and Vue (Raffaele Cariani, Stefano Borghini, CNR ITABC)

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