Chapter 12
Cultural Heritage and Collective Knowledge

Teresa Amodio

Abstract This research deals with the analysis of cultural heritage through innovative technologies and presents, in detail, a project which proved fully in line with the "smart city" model, in specie created for the promotion of the old neighborhoods downtown Salerno. The initiative, named "Salerno in Particular. Cultural Heritage and Innovation", raised from the creativity of several students in the University of Salerno, who—within institutional cooperation—developed a cultural alternative to the extant ones, focused on the systematization of a wide range of knowledge and skills, both humanistic and scientific. Through a wide-ranging performance of activities and events—carried out in different and prestigious venues throughout the city—the historic district's downtown Salerno (a geographical context characterized by a distributed presence of historical, artistic, and archeological relics) have been interpreted and proposed so to retrace the past with an eye to modernity. From a methodological point of view, the named actions have greatly benefited from the geographic-based contribution; in particular, they have allowed the deepening of aspects related to localization and contextualization of cultural heritage and made possible the elaboration of detailed maps (even geo-referenced and interactive, independently proposed, and others) as a starting point for the various involvements of the project).

Keywords Cultural heritage · Innovative technologies
Historical downtown of Salerno

12.1 Introduction and Project Presentation

The locution "Smart City" defines "*a city model that through the help of new technologies is able to implement a transparent and participatory governance policy*

T. Amodio (✉)
University of Salerno, Fisciano, SA, Italy
e-mail: tamodio@unisa.it

aimed at improving the quality of life of its citizens and pursuing sustainable development goals" (Giffinger 2007).

This concept, which has lately found ample interest in political agendas and in scientific studies, refers to "*a territory that*, *in defining its growth and competitiveness strategies*, *adopts a creative*, *digital approach focused on e-governance*, *activating*, *respectively*, *the internal envelope of human*, *technological and institutional factors*" (Caragliu et al. 2011).

This perspective include urban policy guidelines, aimed at enhancing territorial distinguishing characteristics, and at creating new opportunities for economic growth through the development of different local cultural heritages.

In this regard, it is to be said that, after the period when the debates on ancient relics were focused on the need to include the majority of the territorial resources in the conceptual category, the expression of the identity of places has moved to a phase in which has emerged the need, first, to consider cultural heritages within their contexts (so as to include them in a systemic network configuration) and second, to focus the attention on their public fruition. In such developmental logic, it should be considered that the value attributed to ancient relics depends not only on their identification and intrinsic importance, but also on the ability to publicize their presence and to improve their attractiveness by facilitating their enjoyment by a vast majority of the populace.

As a result, the territories do require the use of expertise and resources for the creation of cultural exhibits with a specific content, but—at the same time—with suitable forms of communication and ways of fruition. Such activities should be joined by using techniques, technologies, and innovative tools that can integrate more traditional organizational patterns and enjoyment (Bonacini 2011).

From this point of view, over the last 20 years, new technologies have made a major contribution through solutions that redefine space and timing of data transmission, that emphasize perceptual aspects (through images that aim to facilitate understanding and clarify aspects of complexity), and that are able to actively engage users in content exploration.

Among other aspects, the radical renewal of the design of digital dialog systems has facilitated some characteristics of cultural heritage, in developing new forms of "democratization" of knowledge.

The cultural property sector was also able to take advantage of the opportunity displaying simple and interactive (virtual) reconstructions and virtual tours,[1] increased reality integration[2] (with multi-touch monitors), and user-friendly applications based on tactile systems. Moreover, some dynamic sites[3] and portals have been set up as well as social networks entries.

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[1] Virtual tours recreate virtual spaces within which the user can navigate between different parking points, observing 360°, interacting with the environment, activating points of depth with tabs with textual and multimedia content.

[2] Increased reality allows you to read additional information about the scene, using a QR code that initiates HTML tabs, movies, and audio files.

[3] Dynamic sites, such as social networks, allow continuous interaction from commented or uploaded users.

An example is the project "Salerno in Particular. Cultural Heritage and Innovation", carried out by the Department of Cultural Heritage Sciences of the University of Salerno, in the framework of the activities promoted by the DATABENC.[4]

The nature of the project was of a bottom up type, promoted by the University, in the context of a full collaboration with the competent territorial institutions such as the Municipal Administration, the Superintendence Archeology of Fine Arts and Landscape for the Province of Salerno and Avellino, the State Archives, the Provincial Library, the archiepiscopal Curia.

The project aimed at capitalizing the research results that is knowledge promotion on local cultural heritage, as well as, the restoration in terms of public benefit of a significant system of monuments, tradition, and memories.

To this end, the project intended to contribute to the cultural progress of Salerno, whose stakeholders are engaged since more than a decade in the implementation of a vast urban redevelopment program. This latter has heavily focused on the tourist vocation of the city, resulting in a new cultural gravity of the historical center, and rich in cultural heritage dating back to different historical periods (Roman, Lombard, Norman-Swabian, and Angevin, Aragonese).

As a matter of fact, the area represents a multilayered system that gathers the historical, political, and cultural identity of the city. Therefore, the interventions carried on are based on humanistic and scientific knowledge synergy in order to implement an integrated plan of knowledge, conservation, management, valorization, and communication of such historical and monumental heritage.

As part of the project, a series of geo-referenced thematic maps were drawn up in order to acquire and make available information on the rich monumental heritage existing in the city.

Through the various initiatives of the project, the digital technologies utilized a strategic role in enhancing the fruition of geographical and cartographic contents, as enabled a more rapid and effective dissemination of such enormous flow of information. A result that is particularly relevant when considering the global society we live in, where data and communication take place through endless networks and nodes that are impossible to reach with standard tools.

12.2   The Reference Area

The Municipality of Salerno, with an extension of 59.75 sq. km^2 and a population of 135,261 (2016 data), has a peculiar geographical configuration which has characterized its development path and urban growth.

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[4]Italian acronym for Distretto ad Alta TecnologiA per i BENi Culturali, i.e. High Technology Consortium for Cultural Heritage, private Company which uses modern technologies applied to the cultural heritages.It is a Consortium where the Universities of Naples Federico II and Salerno converge, the CNR, Small and Medium Enterprise Research Entities, created to develop a strategic programming action on cultural assets, Environmental heritage and tourism.

Fig. 12.1 Historic center of Salerno. *Source* Own elaboration

The historic core (Fig. 12.1)—edged by the natural boundaries of the background hills, which have in Mt Bonadies the highest peak, by the sea, and in the West, by the orographic features of the Amalfi Coast—have had the possibility to expand its south side only eastward.

This expansion, affected by an intensive urbanization, eventually reached the Municipality of Pontecagnano, with which presently the city of Salerno is a complete conurbation.

The urban expansion, driven by demographic growth and by new public housing programs (aimed to relieve the damages caused by the 1954 flood), led to the establishment of new neighborhoods in the South East direction and to the related progressive desertion of the Old Downtown, at first by middle-class traders and small craftsmen and then by poorer classes workers. This flow left back many empty houses, often illegally occupied by non-EU immigrants expelled from the countryside or attracted by prospects to improve their quality of life.

The outpouring from the Old Downtown was exacerbated by all the persons displaced from their houses due to the 1990 earthquake that struck the entire Campania Region.

This led again to a gradual urban degradation, an economic devolution, a widespread sentiment of disaffection, and a loss of places' identity. Nevertheless, at the end of the 1980s, some circumstances—such as the revivification of the scientific debate about the recovery and enhancement of historic downtowns, the appreciation of the financial opportunities offered by the European Union, and the determination of the local politicians—reversed the trend that until then had been recorded.

Since then, Salerno has been affected by a significant urban and socioeconomic transformation, still in progress, that has enhanced the touristic potential of the city and established a central reference for both its large provincial territory (to name only the Amalfi Coast, the Capaccio-Paestum Magna-Graecia archeological area, and the Cilento coastal district) and other linked regional areas such as the Royal Palace of Caserta, the Roman City of Pompei, or the islands in the Gulf of Naples.

The main course of action has involved the improvement of the touristic functions related to ships and seafaring activities through an immense infrastructure along the south coast, completely renovated and equipped with facilities for sailing crafts, powerboats, and cruise ships, with a new harbor, and with mooring spaces for leisure boats.

Cultural happenings have also multiplied, partly due to tourism development goals and partly to the city people itself with its demand for inclusive and collective growth. Those activities have originated a wide range of initiatives.[5]

Last but not least, many actions aimed at improving the quality of life for local communities have been launched, such as the recovery of urban design and security, the restoration of ancient monuments and churches, the opening of public parks and gardens, the arrangement of streets and squares, and the creation of spaces for artistic, cultural, and recreational activities.

In this multifaceted process—since the 1990s (the beginning of the urban transformation of Salerno)[6]—the historic downtown has been the object of a substantial structural redevelopment work, which had as a direct consequence the progressive restoration of residential functions and then of economic and cultural assets, with a priority given to the services sector. In addition, it must be credited an unwritten desire to return to the ancient city nucleus, with its historical, artistic, and archeological evidences of great wealth, to represent the role of the territorial center for renewal, and to support those cultural initiatives that could, in various ways, contribute to reinforce the already defined urban strategy.

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[5] Among which Luci d'Artista, Linea d'Ombra, Literature Festival, and Premio Charlot.

[6] Actions funded by the Urban and Urban II Initiatives.

Fig. 12.2 Touch screen for geo-referenced interactive mapping. *Source* Own photo

Table 12.1 Monument with historical and artistic relevance in the historic center of Salerno

Typology	Number of structure
Church	30
Palace with historical relevance	9
Historic garden	1
Monastery and convent	10
Conservatory	1
Ancient hospital	1
Religious seminar	1
Museum	2

Source Data processed based on the ABAP Superintendence for the city of Salerno and Avellino

12.3 "Salerno in Particular—Cultural Heritage and Innovation"

The initiative,[7] dedicated to the historic downtown of Salerno, has been a composite engagement based on the integration of both humanistic and scientific knowledge for the development of an integrated plan of analysis, promotion, and outward advertisement of the existent precious monumental heritage.

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[7]http://www.databenc.it/wp/prodotti/.

The project benefited from an in-depth work of specialists that made possible to outline the reference database, conceived to include both the geographic context, as a whole, and the aggregate of cultural heritage sites (museums, churches, aristocratic residences, and archeological discoveries, as well as minor elements rendering ancient ways of life and civilization, such as isolated courtyards or smaller streets).

This phase was followed up by the identification of innovative means of exploiting the cultural heritage with the support of new technologies, aiming to enable citizens, as well as tourists, to learn more in detail about the eminent system of monuments, traditions, and memory from which the current city configuration is stemmed.

The outcome has been the arrangement of an articulated network of activities consisting of an interactive mapping of monumental heritage, an application for the historic downtown as a whole, a dedicated footage, a Digital Versatile Disk (DVD) that recreates city monuments, history, and culture. Moreover, it has been staged a public information campaign consisting of conversations addressed to the citizens, several multimedia installations, a city knowledge atlas and a specialized application, the "Guide to the Sarcophagi of the Salerno Cathedral".

These activities have been located and presented in various strategic loci around the city, appropriately identified and set up to exhibit the desired system of cultural offerings and to offer a chance to appreciate such prestigious locations for a period of about three months (November 2016–February 2017).

The first step was the development of a geo-referenced, interactive mapping (Fig. 12.2).

The map was created to represent the monumental assets located in the historical center, in relation to the reference contest (Table 12.1), surveyed trough on-the-spot inspections and the support of the Superintendence of Archeology, Fine Arts, and Landscape for the city of Salerno.

During the first stage of the map, elaboration was carried out a survey on the fabric of the city (buildings, streets, squares, courtyards, as well as other architectural elements such as pedestrian arches, which are a linked between structures above the road plan), through the specific analysis of both urban and topographic elements; reported on cartographic bases.[8]

The representation of the urban fabric, shaped with reference to topographic elements, have facilitated the identification and naming of buildings of historical interest as well as the determination of the correct names of streets and squares.

Subsequently, the identified assets were geo-localized and the historical and artistic structures represented on a series of large-scale maps (1:5000), indicating the related chronology (Fig. 12.3), the ownership, the original as well as the current functions.

Applied cartography, when accessible through a touch screen, will provide the designation of every single city monumental heritage site, classified by typology

[8]Digital georeferenced orthophotos of Campania (orthophotos dated 2004 on a scale of 1:5000 and dated 2011 on a scale of 1:10,000); topographic map OSM (OpenStreetMaps); open source topographic maps available online.
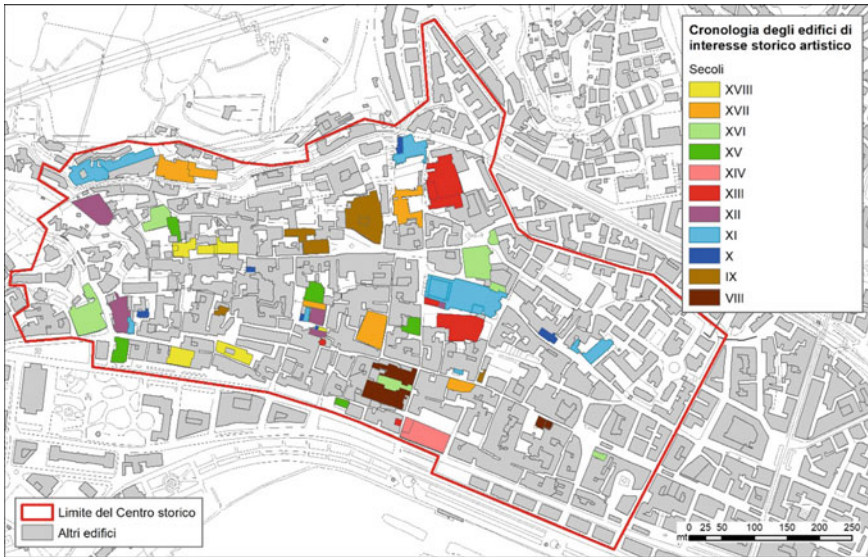
Fig. 12.3 Information level relating to the buildings chronology. *Source* Data processed based on the superintendence for the city of Salerno and Avellino

(churches, monasteries, mansions, palaces, etc.), the display of related comments, and some photographic images, specially made.

12.4 Additional Application of Cartography and Computer Applications

The same cartography, printed in a large-scale format (7.0 by 3.5 m), was also a reference for the "Salerno" exhibition—in particular "Pictures of the Old Town"—to highlight the complexity and richness of the cultural heritage of the city context (Fig. 12.4). The cartography, has been realized in a multilevel PDF format, including open layers in EPS format (compatible with Adobe Photoshop).

The huge size of the cartographic representation, characterized by the precise location of the spots therein, was complemented by several detailed views taken during a photographic campaign by the author, which while portraying paintings, sculptures, and other architectural elements, revealed new small details known as "urban landscape" (such as pavements, portals, arches, windows, etc.).

Photographic images on the main map have been accompanied with QR code for supplemental information labels, which could be viewed by device-equipped visitors.

Fig. 12.4 Image of the large cartography exposed during the show. *Source* Own photo

At the same time, a photographic contest was launched among high school students, to promote the consideration of the valuable and stratified cultural heritage of the ancient center of Salerno and interpretations of the city's image.

The initiative was greatly appreciated by the participants and provided another recognition of some of the details represented in the shoots exhibited during the show. Indeed, it brought forth the identification of their exact position by GPS and the acquisition of several new pictures, related to one or more specific features, with reference to their specific context.

During the exhibition period, it was also staged a cycle of conversations titled "La bellezza dei secoli in Salerno" ("The Beauty of Centuries in Salerno") which, moving through the history and the artifacts of the city from ancient to contemporary times, was an occasion to introduce the rich heritage, still perceptible today in museums, in palaces, in churches, and in the urban fabric of the Old Town.

In the same venue of the show, as well as in other parts of the city, the project of the "Cross through Salerno" was set up so that—with reference to the history, the monuments, the traditions, and the suggestive glimpses of the historic downtown—it was able to offer a reconstruction of the close link between the most significant religious places in the city and the active memory transmitted by its historical and monumental heritage.

The combination of geographic elements, ancient relics, and new technologies has also been implemented with the organization of a laboratory, located in Palazzo Fruscione, which has allowed its visitors to experiment some technological applications presented through multimedia and interactive installations.
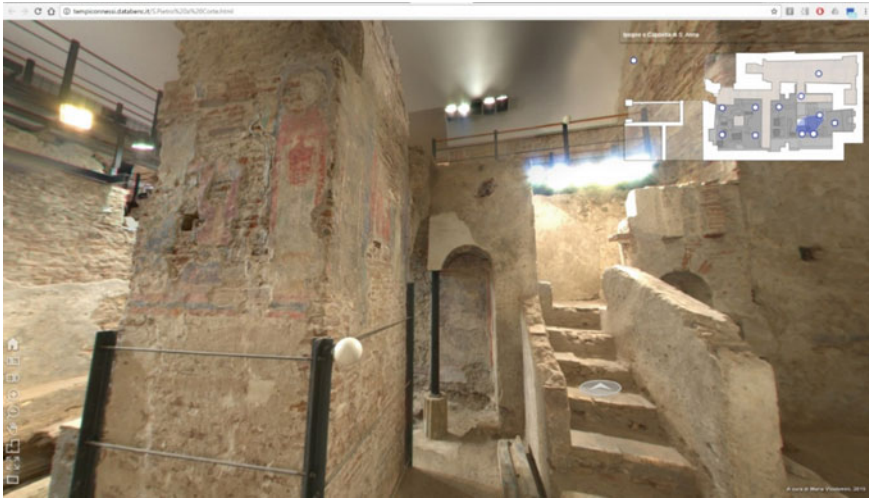
Fig. 12.5 Framework of the installation "Videostoria di San Pietro a Corte". *Source* Own elaboration

The first involved—named "The Line of Time" and dedicated to the Monastery Compound of St Peter a Corte—was meant to provide a vision of the monument history in relation to the political, social, and cultural transformations of Salerno. The application highlighted the historical and artistic stratifications characterizing the monument, enabled it to be enjoyed even by less educated users (with virtual navigation through time, divided into six different phases), and presented finds or discoveries of different works of art, with the related bibliographic sources. An ancient status quo of St Peter's a Corte church has been inserted in the virtual 3D reconstruction of the monumental Roman phase (Fig. 12.5).

This is the scenario in which takes place a computer game named "Hippocratica Civitas".[9] The game, envisaged for collaborative action,[10] stages a journey to different archeological themes, the overcoming of which allows you to virtually visit the various structures in the simulated reconstruction of the ancient compound.

In order to promote the rediscovery of this portion of the millennial life of Salerno, the multimedia exhibition "Video Story of St Peter a Corte" has been performed inside the monastery. It is a journey through life from Roman times to the present, under the guidance of a narrator's voice that illustrates the stratification of phases and cultures with the aid of light effects, of images projections, and of 3D pictures mapping techniques.

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[9]"Hippocratica Civitas" (Latin for "Hippocratic Town") is the motto on Salerno's Coat of Arms.

[10]The use of virtual reconstructions is presented through multi-platform and multi-device cooperative activities that allow groups of users to navigate within the same reconstructed environment, using a combination of immersive reality (3d viewers, Oculus Rift), 3d reality (With autostereoscopic screens) and collaborative interaction through appropriate sensor (Kinect).
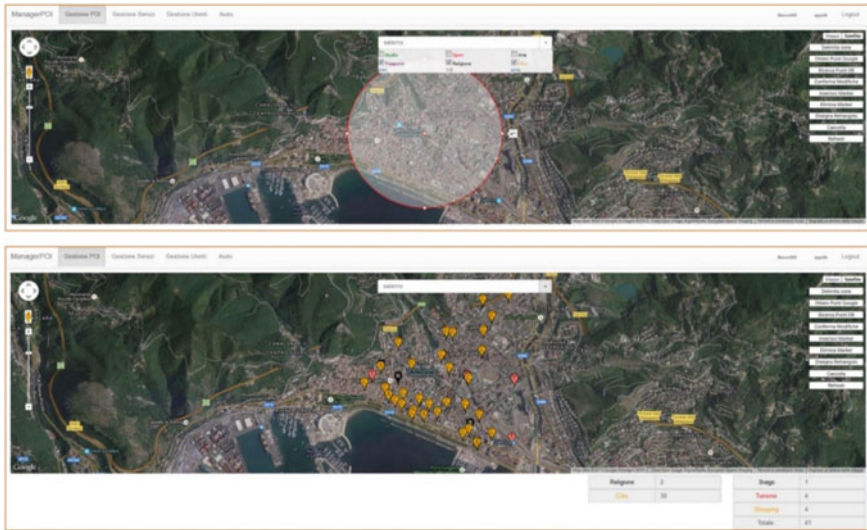
Fig. 12.6 Salerno SmartApp framework. *Source* Own elaboration

Starting with the objective of gathering knowledge and a careful acquisition of cultural heritage, has been, finally, developed a territorial database called the "Atlas of Knowledge".

This data collection has been designed with the aim of assembling and making available online information about a wide range of cultural assets (e.g., archeological and monumental heritage, fine arts, architectural structures, landscapes, etc.) in a geo-referenced and integrated way.

The geo-referenced map has been used in the implementation of other project activities, including the configuration of the SmartApp "Salerno", developed for mobile devices as a guide to the city main points of interest (Fig. 12.6).

A second application, in double version—for standard sight and non-sighted people (this latter developed in collaboration with the Italian Blind and Visually Impaired Union)—is available for a visit to the Roman Sarcophagi, reused in medieval times, which are arranged in the quadriportico of St Matthew's Cathedral.

As a consequence, an articulated system of knowledge is currently available, aimed to facilitate the management of the cultural heritage of Salerno's historic downtown in the processes of urban planning, protection, and conservation, and of improvement of cultural assets.

As an added value, it is also accessible the provision of expert opinions in cases of archeological risk determination. In the "Atlas" the context of the Old Town was also
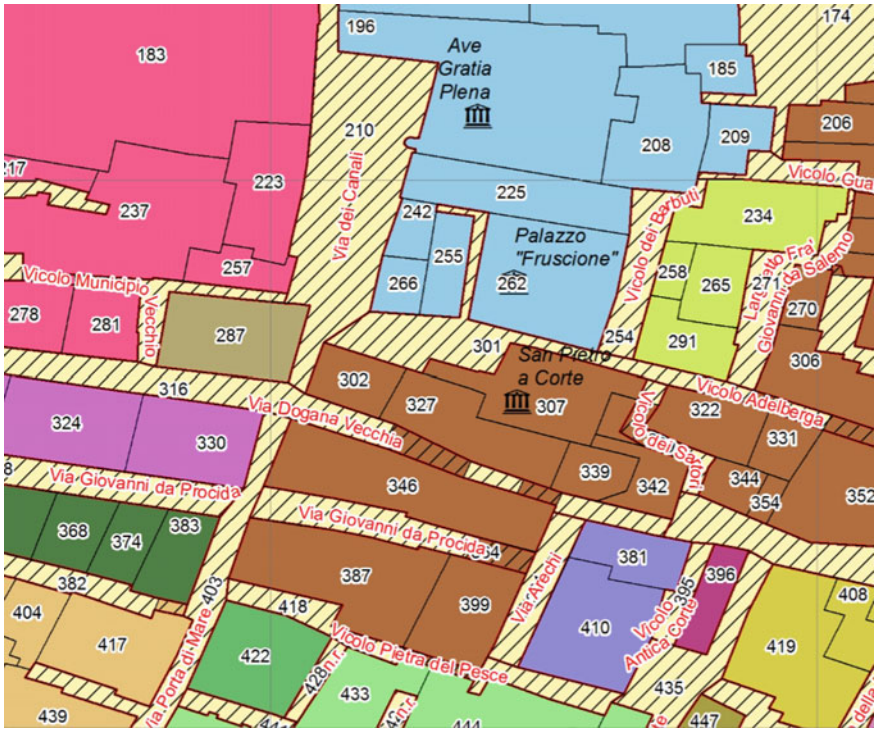
Fig. 12.7 Detail of cartography for UTU/EU representation. *Source* Data processing on surveying archeology, fine arts and landscape for the provinces of Salerno and Avellino

presented through an Archeological Urban System, characterized by the division of the territory into Topographic Urban Intervention Units (TUIU).[11]

A TUIU defines the spatial-temporal dimension and represents the logical framework of the information system. It corresponds to a container and, at the same time, a "historical landscape" unity.

It is the geographical areas where converge cultural, topographic and archeological information of both past and future, as well as the transversal data and photo archive (database) of the archeological, cultural, and environmental heritage having historical and tourism importance.

These were realized by adapting the current urban structure to the historical one, derived from the cadastral maps and verified on a periodic basis through the perimeters and typology of the urban elements (Fig. 12.7).

This configuration adds another step to EU defined level (Urban Entity), created as an UTU grouping in larger aggregates, in order not to split the cross-sectional

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[11]The TUIU is a logical scaffolding of the information system, defined by the space-time dimension, in which cultural, ancestral, topographic, archaeological, or archaeological, cultural, environmental, and tourist information can be combined.

elements that were affected by multiple UTUs such as the facades of historic buildings or porticoes running through multiple buildings.[12]

In the final version, the database includes the following fields:

– the ID of the UTU;
– cartographic coordinates "*x*" and "*y*" of the UTU central point in decimal degrees (GCS—Geographic Coordinate System *ETRS* 1989/UTM Zone 33N);
– unit category (buildings or streets and squares);
– ID of the category that can include several UTU;
– description of the UTU (for the categories building is used an alphanumeric abbreviation, streets, or squares instead were referred to with the place names);
– perimeter dimension of the UTU expressed in meters while the area measure is in m^2;
– EU identification code; cartographic coordinates "*x*" and "*y*" of the central point of the EU in decimal degrees (*ETRS* system 1989/UTM Zone 33N).

The final cartography, in addition to the UTU/EU level, includes other overlapping levels such as streets and squares toponymy; main points of interest in the historic center of Salerno (POI); the ESRI basic topographic map; a selection of the Numeric Regional Technical Paper of the Campania Region (CTRN 98), which contains only those information consistent with the involved research; an excerpt from the cadastral map of Salerno.

12.5 Research Results

In general terms, the initiative was considered praiseworthy for having told the historic center with details and minutiae not always known and visible.

Thanks to all the other events organized, there has been a rediscovery of the city, just as the photographic competition represented a further enrichment for the young students who had the opportunity to discover and appreciate further its territory. Using modern tools and languages, in fact, they were able to "dialogue" with the past of which there is still traces in our alleys and in our palaces.

Considering all the proposed events, the project received a huge appreciation in terms of visitors and users (including students and people with disabilities), about 15,000 in 3 months, who commented positively the initiatives, especially with regards to existing fruition tools.

So, with reference to the effects of the project, in view of usefulness for the city, it should be borne in mind that the activities put in place have had local communities as their destination, especially as regards the youth component, so as to strengthen the awareness of the value of resources located in the territories to which they belong, but also tourists.

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[12]The TUIU spatial contiguity is used for EU detection.

The appreciation for the initiative was witnessed by the turnout and significant success that the project as a whole has received not only among the Salerno, but also among visitors from other regions of Italy and abroad. The initiatives implemented have allowed to make known and appreciate the important and often unknown artistic and cultural heritage of the city, returning the collective dimension, which belongs to the city and to research.

Overall, the exhibition "Salerno in particular—Images of the historic center" was visited by about 1500 people; while at Palazzo Fruscione and San Pietro a Corte, where multimedia installations are set up, around 9000 visitors were registered.

The Virtual Museum of the Salernitan Medical School has hosted around 1100 people.

The turnout was high especially during the Christmas period, thanks to the concomitance with "Luci d'Artista[13]"; the peak of presences was on January 1.

The exhibition has been appreciated by many students and by over five hundred visitors, mostly residents in the municipality of Salerno, although there have been users from other regions (mainly from Lombardy, Emilia Romagna, and Lazio) and some foreign countries. Many students who also participated, with interest and enthusiasm, always at Palazzo Ruggi d'Aragona, to the cycle of conversations entitled "The Beauty of the centuries in Salerno" that has retraced the history and art of the city, from the age ancient to contemporary".

But particularly appreciated was the ability to involve young people in initiatives related to cultural heritage, directly related to the type of instruments adopted. In the case presented, for example, the decision to set up a photographic competition concerning some of the cultural heritage of the city of Salerno was a particularly appreciated and effective choice.

Sixteen classes of nine schools in Salerno and the province participated in the photo competition, which engaged in the study and recognition of the rich and stratified cultural heritage of the historic center. The young students have been called to photographically recontextualize some little-known details or for different reasons even "invisible" of the ancient city having as a trace the 100 details of portals, floors, and windows immortalized in a "metaphysical" by the photographer Ciro Fundarò and exposed in the exhibition "Salerno in particular—Images of the historic center" realized at Palazzo Ruggi d'Aragona by DiSPaC, in collaboration with the Superintendence.

The pupils had to draw inspiration from the shots made for the exhibition and aimed to bring to light the extraordinary beauty of the urban landscape.

Through the "like", the boys have "challenged" on Facebook, while the best shots were chosen and then evaluated by a special commission that, based on the quality of the photos, has rewarded the winners with certificates of participation in the Competition, a copy of the exhibition catalog "Salerno in particular. Images of

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[13]The initiative consists of the installation of luminous art works, created by internationally renowned artists, scattered throughout the main streets and in the most attractive corners of the Historic Center.
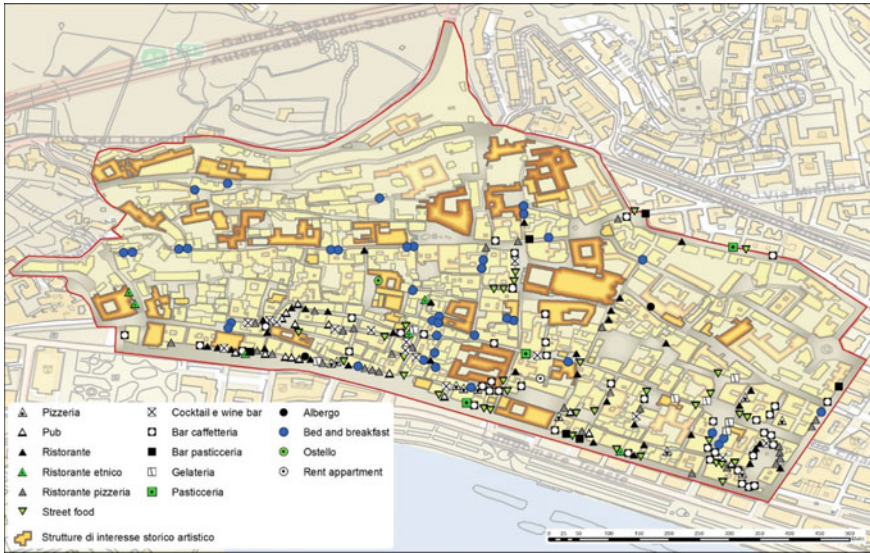
Fig. 12.8 The receptive and restaurant activities. *Source* Data elaboration made available by chamber of commerce, industry, agriculture, and craft

the historic center" and the printing of the winning photos in large format that can be exhibited in the premises of the school of origin.

Therefore, the shared synergy with the local institutions that if on one hand can support the initiatives themselves, and at the same time, benefit from cultural activities made available to the territory in an optic both of strengthening the overall cultural offer and of collective involvement.

As far as the real lack of explanation on how this project has contributed to some local decision-making process, in particular urban planning, it should be noted that the municipal administration asked for a GIS implementation with additional levels of information, to be associated with geo-referenced maps and connected with tourism services.

In a first phase, the request concerned the realization of a tool able to enhance a greater knowledge about tertiary touristic activities, to be located in different points of the city, through dedicated installations.

To this regard, geography and its tools represented to proper discipline, as it made possible to further support the tourism development of the geographical context. It was, therefore, realized a first informative level, concerning accommodation and restaurant segments, connected with the presence, consistency, and location of hotel and extra hotel in the historic center of Salerno (Fig. 12.8).

The activity involved information retrieval and a database implementation relating the commercial functions performed in the historical center, the area delimitation, on-the-spot investigations aiming at obtaining the geographic coordinates of the areas statistically surveyed and coordinates synchronization through the geo-mapping ser-

vices. Finally, was developed a geo-referenced cartography concerning the selected activities, that were already classified (Fig. 12.8).

The data have been provided by the Chamber of Commerce of Salerno which has made available the lists of all the activities listed above, attributable to the entire municipal territory, containing, for each activity, a series of very detailed information on names, activities, tax codes, VAT numbers, ATECO codes, addresses, and years of construction.

Extracting just the data related to the historical center first identified the presence, consistency, and exact location of the present activities, and consequently was developed a consistent database containing the relevant information.

All the data concerning the registered structures were verified and geo-referenced through a survey using a professional GPS device with Geotag Photo function, and they were integrated with detailed data,[14] acquired with direct surveys, and photographic campaign.

During the cartographic representation phase, in order to simplify the information reading and to guarantee a direct access user service having in mind the tourism purposes, the accommodation and restaurant activities have been divided into different categories (Hotel, Bed and Breakfast, Hostel, Rent Apartment, Cocktail bar, Cafeteria bar, Pastry bar, Ice-cream parlor, Confectioner's shop, Wine bar, Pizzeria, Pub, Restaurant, Ethnic restaurant, Pizzeria restaurant, and Street food).

With reference to the historical Center, a geo-referenced synthesis cartography was realized, gathering 278 accommodation and catering facilities, identified within the involved territorial area, where were then added the structures with historical and artistic relevance.

12.6   Conclusions

Assuming that improving the knowledge of places can be created added value, changes, and innovation, it is possible to carry out some synthesis reflections aimed at highlighting the role of cartography in smart growth processes, connected with the local cultural asset.

On the whole, the initiative has been a model (a prototype) of factual design and actualization inspired by the smart city principles, both for the purpose of promoting cultural heritages, supported by innovative technologies, and in relation to the "Social Inclusion" criterion.

First, it must be said that initiatives aimed at disseminating knowledge of cultural heritage cannot be separated from a start-up phase characterized by the setting up of interdisciplinary humanistic and specialist competences. In the specific case, experts in the history of art, archeology, or epigraphy have provided the knowledge of the

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[14]Per ciascuna struttura, schede contenenti la denominazione dell'attività, le fasce orarie di apertura e chiusura, i giorni di chiusura, ma anche i recapiti telefonici, gli indirizzi e-mail e web site, nonché il numero di tavoli o di stanze, a seconda che si trattasse di attività di ristorazione o ricettiva.

sectorial type related to the territorial endowment on which it is acted to activate local development processes.

These territorial connotations were then deepened by the geographical study that allowed both to contextualize the presence of cultural heritage, and to carry out cartographic elaborations, at different scales, through a GIS.

In this regard, it should be emphasized that the geographical research, in the specific case, has contributed to the overall realization of the project in various capacities, through the realization of territorial studies as well as the elaboration of numerous cartographic representations, some of which geo-referenced and interactive.

The activities carried out and the relative research products were aimed at realizing cognitive frameworks and cartographies to be inserted in the computing platforms in order to convey the project contents through social networks.

In this regard, it should be said that the set of cartographic contents and tools have been made available and processed by experts in innovative technologies so as to be able to design effective ways of disseminating and disseminating knowledge, based on some principles, some of which respond to the logic of facilitation and attraction.

References

Bonacini E (2011) Nuove tecnologie per la fruizione e valorizzazione del patrimonio culturale. Aracne, Roma

Campbell T (2012) Beyond smart city: how cities network, learn and innovate. Earthscan, New York

Caragliu A, Del Bo C, Nijkamp P (2011) Smart cities in Europe. J Urban Technol 18(2):65–82

Caroli M (2016) Gestione del patrimonio culturale e competitività del territorio. Una prospettiva reticolare per lo sviluppo di sistemi culturali generatori di valore. Franco Angeli, Milano

Cessari L (2016) Città, siti, musei: La ricerca scientifica e l'innovazione tecnologica per lo sviluppo del territorio. Gangemi, Roma

Dameri RP, Giovannacci L (2016) Smart city e Digital city. Strategie urbane a confront. Franco Angeli, Milano

Folger P (2010) Geospatial information and geographic information systems (GIS): current issues and future challenges. Biliogov, Columbus

Garofolo I, Conti C (2013) Accessibilità e valorizzazione dei beni culturali. Temi per la progettazione di luoghi e spazi per tutti. Franco Angeli, Milano

Giffinger R (2007) Smart cities. Ranking of European medium-sized cities. Centre of Regional Science, Vienna

Granelli A, Scanu M (eds) (2009) (Re)design del territorio. Design e nuove tecnologie per lo sviluppo economico dei beni culturali. Fondazione Valore Italia, Roma

Lee JG, Kang M (2015) Geospatial big data: challenges and opportunities. Big Data Res 2:74–81

Picon A (2015) Smart cities: a spatialised intelligence. Wiley, New Jersey

Robinson AC et al (2017) Geospatial big data and cartography: research challenges and opportunities for making maps that matter. Int J Cartography 3:32–60