Drawing, Analysis and Representation of space-time. A Timeline for the Description of the Classical City

Francesca Fatta, Manuela Bassetta

Abstract

The description of the sedimentation time of architectural works and urban spaces is not an innovation, but an exigency that in the field of history has had graphic examples of great interest, which can be defined as the forerunners of the timeline.
Drawing challenges the conventional way of thinking about form and becomes a tool for the narration and classification of historical and cultural events. Here we present the results, following experimentation, of the GAIA research project entitled Young People for an Interactive Archaeology in Calabria *aimed at the development of a new educational interface which, starting from 3D models of cities of the classical world, generates a system of signs/drawings capable of correlating places, buildings and objects far removed in space and time.*

Keywords: architectural knowledge, data visualization, timeline, spatio-temporal data, semantic form.

Introduction

Throughout the history of drawing, one of the most frequently recurring exigencies has always been that of the representation of time.
Time is usually represented in the form of an oriented straight line and, in fact, the linear metaphor, often used in almanacs, calendars, charts and graphs of various kinds, reflects our everyday language when we speak about time that passes, according to a 'before' and an 'after,' according to 'long' or 'short' durations.
For this type of representation, the English term 'timeline' was coined. A timeline is a 'graphic strategy' for representing, according to a logical order, the consecutive series of events in various fields of science and culture; the sequence of events in the field of history, the temporal scansion of memorable events in the context of various disciplines, such as geology, physics, astronomy, etc. Generally speaking, more than a list in the form of a written text, a timeline consists of an actual visual representation of the line of time, a diagram in one or more dimensions whose typical shape is that of a long bar (usually oriented horizontally) whose length is marked by the indication of the period at regular intervals (eras, epochs, centuries, individual calendar dates, hours, minutes) and by classifications that contain, for each, and at varying intervals, indications of the events intended to be shown in their chronological sequence. There are many ways to represent chronological tables: from a historical point of view, timelines were, originally, still images drawn or printed on a physical support.

https://doi.org/10.26375/disegno.1.2017.15

ISSN 2533-2899

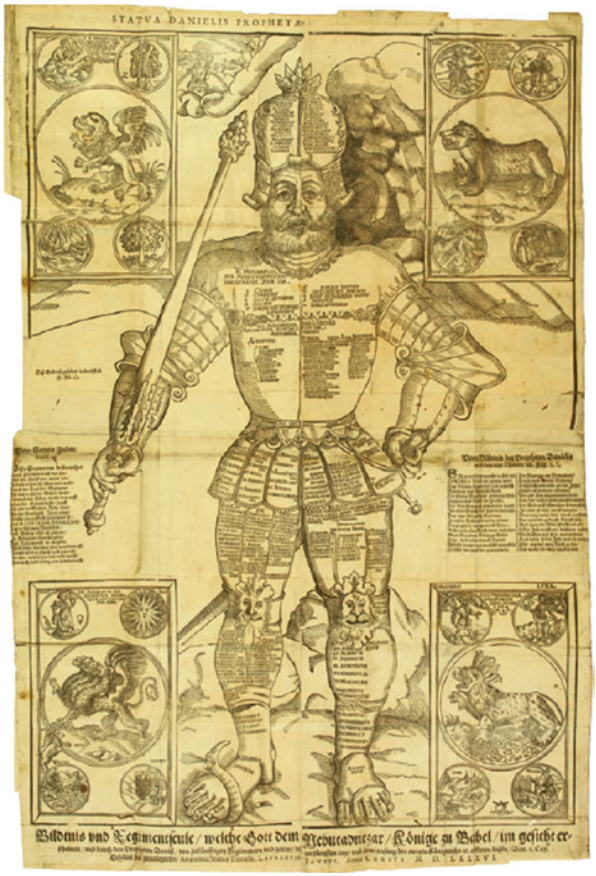


Fig. 1. The metaphor of the Giant, Anatomia Statuae Danielis by Lorenz Faust, 1585.

In these images, importance was given to graphic design and to the artist's ability to communicate information effectively. Today, with the use of digital and interactive technologies, timelines are no longer influenced by the functional and spatial limits that those drawn on paper are subject to, principally because they have become so much a part of our culture that it is hard to think that, in its modern form, the timeline is not even 250 years old [1]. In fact, it would be wrong to say that a representation of events in chronological order had never existed, because time, before a true codification, had always been present in a great number of drawings. From medieval manuscripts to the Internet age, a wide range of timelines have succeeded one another, with their forms giving life to wonderful narrations [2]. This paper is divided into two parts. The first deals with the theoretical aspects and historical examples useful in determining the criteria for the graphic representation of an event, a period of the past or a complex project. A drawing in this case becomes the 'graphic memory' of a process, viewed in synthesis, particularly useful for describing events of long-term modification, as well as for describing multidisciplinary approaches. In the first part, the premises for connections among related disciplines (graphic design, InfoVis, CAD and GIS) are set forth, so as to bring out the interdisciplinary implications typical of contemporary research. The second part is dedicated to the presentation of the results of the GAIA research project (Young People for an Interactive Archaeology in Calabria) [3] which, starting from the project of a timeline, proposes an edutainment (education through entertainment) program for very young participants, for the refurbished Archaeological Museum of Locri. A new educational interface which, starting from 3D models of cities of the classical world, generates a system of signs/drawings capable of correlating places, buildings and objects far removed in space and time [4].

Initial context

Together with writing, drawing is one of the few languages capable of making time visible. Time, contrary to what we tend to imagine, is not something that flows uniformly along a linear trajectory, but can expand, contract, stop, suddenly change direction, or move along the loops of an endless maze. Michel Serres, for example, is speaking of this when he asserts that "space flows like time" [Serres 1993, p. 62], that is, that there exists a subjective perception of time expressed by rhythms that reflect moods, cultural expressions, scientific events, architectural configurations. Basically, one must consider that spatio-temporal rhythm is a human need and that the two vital psycho-physiological cadences, the heartbeat and breathing, give us the sense of a search for a fundamental rhythm, for an order that flows inside us. The field of graphic representation has assimilated working techniques borrowed from other sciences, has expanded and updated contents and tools, developing new research topics and specialized fields of inquiry. This paper deals with

the theme of representation in reference to the sedimentation time of architectural works and urban spaces, and for this reason it is necessary to take a look at what the description of places and facts in transformation regards. Drawing challenges the conventional way of thinking about form and becomes a tool for the narration and classification of historical and cultural events, geographical territories and architectural concepts. Some examples of critical work on this topic–which receives so little attention under a disciplinary profile–have been the subject of study by Eviatar Zerubavel in his book entitled Time Maps: *Collective Memory and the Social Shape of the Past* [Zerubavel 2005]. In this book, the scholar analyzes the cognitive models that we use to organize the past, the mental strategies that govern the preservation of memories, and that help us to connect unconnected events. The aim is to translate them into coherent narrative systems, signs of the social grammar that lies at the base of a univocal interpretation of history. What appears evident in this book, is the lack of appropriate drawings, or eye-catching graphics, able to really capture the reader's attention through a link, semantic as well, of the facts described. Yet historical examples of timelines and timewheels are not lacking, especially in the Age of Enlightenment when, according to an evolutionistic viewpoint, wide-spread interest in correlating the development of society with scientific discoveries and political achievements literally exploded [Rosemberg, Grafton 2010, p. 272].

The evolution of time charts: a few examples

Even in the very first chronologies by Greek and Roman scholars tracing lists of kings, priests, magistrates or winners of the Olympic games, a way had been shown to summarize complex parts of the history of a people, and 'tables' represented the appropriate instrument for making predictions or acquiring knowledge. In the Roman world, chronologies reflected the demands and needs of those times and, in particular, the desire to make order in a world where the forces of its complexity were uncontrolled.
From the Classical age to the Renaissance, chronology was one of the most important conquests of advanced studies. In some respects, it reached a status even higher than the study of history itself. While history was concerned with stories, chronology was concerned with facts. Moreover, the facts of chronology had significant implications that went beyond the academic study of history.

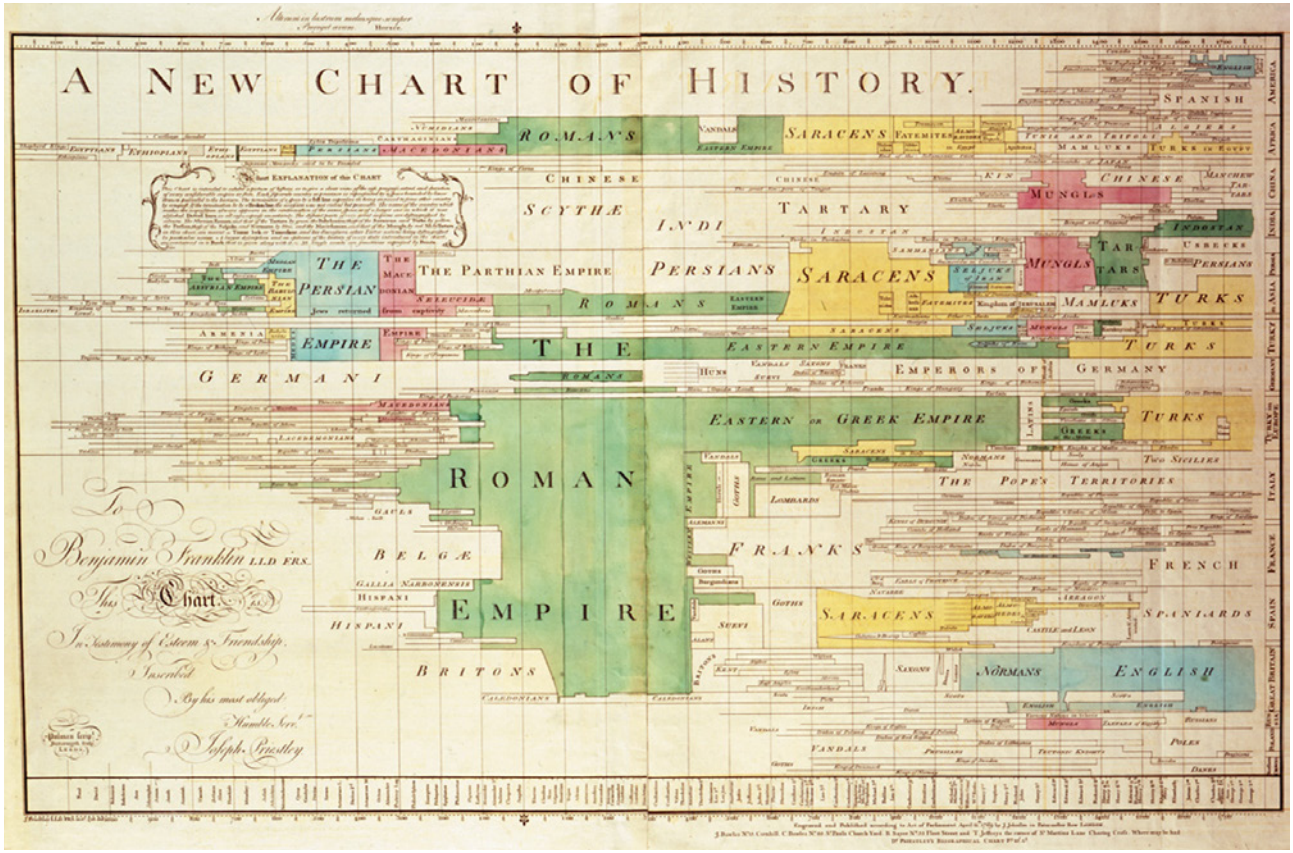
Fig. 2. The metaphor of the Hand, Anatomia Statuae Danielis by Lorenz Faust, 1585.

The human body metaphor

During the course of the early modern age, various experimentations were already being performed. Some of these were of biblical derivation; in the *Book of Daniel* we are told that the Babylonian king Nebuchadnezzar dreamt of a statue with its head made of gold, its chest of silver, its belly of bronze, its legs of iron and its feet of clay. The dream was interpreted as a premonition of the kingdoms that would have followed his, until the coming of the divine kingdom.

Thus, throughout the entire Middle Ages, the image of this statue was used in representations of time. Perhaps the best known example regards Lorenz Faust's *Anatomia statuae Danielis* (Anatomy of Daniel's Statue), published in 1585.
In different parts of the statue's body, the names of a series of ancient and modern kings are inscribed, from Persian to the German sovereigns, a metaphor of the human body (spatio-temporal synthesis) used to demonstrate a direct line of descent between the great rulers of the past and the German rulers. Another metaphor widespread over the centuries was that of the family tree, which allowed noble families to demonstrate their illustrious ancestry and to visualize their origins, just like the graphical representations based on the drawing of a hand, at the time a fundamental tool for its help in memorizing information. In addition, symbolic architectural elements such as cippuses, steles, and columns were always used as metaphors of time.

Fig. 3. The first temporal map, A New Chart of History by Joseph Priestley, 1769.



The search for simplification

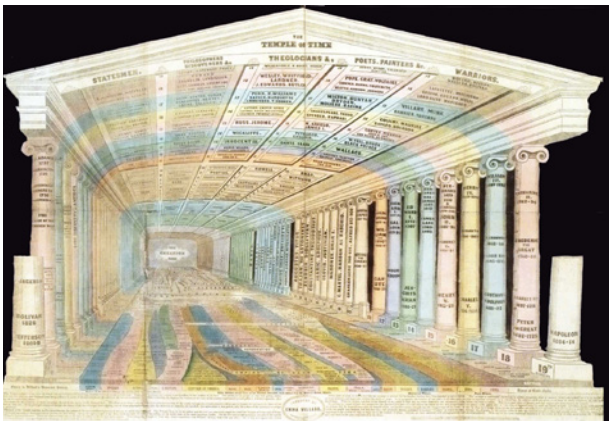
After many imaginative solutions, in the mid-eighteenth century there was increasing evidence of a tendency toward simplification, a desire for synthesis, the determination to "create a visual scheme that clearly communicated the uniformity, directionality and irreversibility of historical time" [Rosenberg, Grafton, 2010, p. 11].
According to historians, the real turning point in the representation of time arrived thanks to an innovative English scientist, Joseph Priestley (1733-1804), author of numerous works and inventions. The chart that he proposed was the *Chart of Biography* (1765). The large table presented a time scale on the left and a detailed color representation of history in the center. The chart was designed to be consulted like a geographical map. In this lies the great graphic innovation: the timeline is represented on a single large page and no longer divided into several parts to be leafed through like a book; the dates are placed at regular intervals and arranged horizontally across the page, from left to right, in the direction of reading. It is a timeline in which the dates run horizontally, at regular intervals, along the top and bottom margins. This chart was the expression of a new style of thought which attempted to explain why the present was what it was. Knowledge of the past became crucial for explaining the present and Priestley's diagram provided a synoptic view of how from the past one reached the present day. Another system, characterized by synthesis and graphic efficacy, that was developed soon after timelines, is a circular or spiral representation of time. There are many historical examples of timelines and timewheels and some charts reach very high levels of aesthetic and technological refinement.

The *Temple of Time*

A representation with a three-dimensional effect regards Emma Willard's *The Temple of Time*, published in 1846, a three-dimensional projection of historic chronography created by the founder of the *Troy Female Seminary*. This representation can be considered a wonderful example of edutainment *ante litteram*.
It is an extremely effective visual metaphor in which history takes the form of a classical temple. The pillars on the right represent the centuries of the Old World, inscribed with the names of the great men who had governed them,

Fig. 4. Time Wheels: Chart from the Earliest Records, Sacred and Profane, from the Creation to the Apocalypse by Richard Cunningham, 1833.

Fig. 5. The three-dimensional syntheses: The Temple of Time by Emma Willard, 1846.

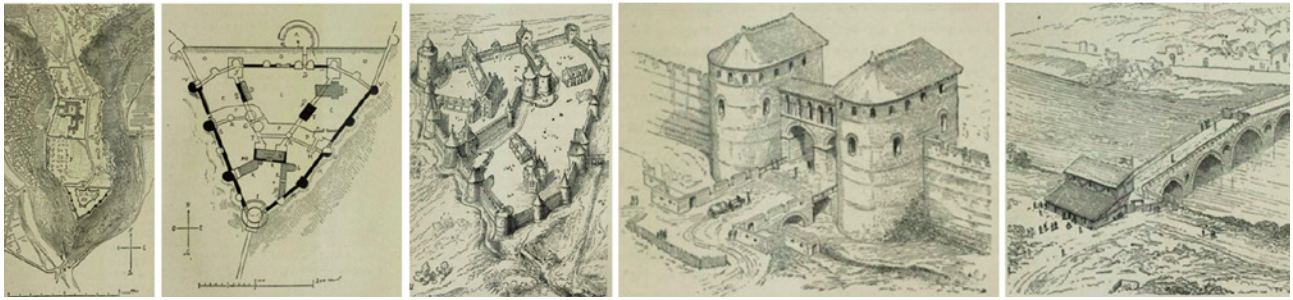


the half-pillars represent the current century, the pillars on the left representing the centuries of the New World. The five long compartments of the roof were biographical charts of important men (statesmen, philosophers, inventors, artists and warriors). On the floor, events of the time were reported.
The table, in bright colors on a black background, was very successful and many American students would have remembered historical sequences for the rest of their lives thanks to this intelligent representation.
The historical overview of the *Temple of Time* is seen almost as a desire to go beyond verbal language and to think of time streams according to other criteria.

The history of architectural modifications in a drawing

The historical premises of timelines were the foundation on which to base a project adopting associative, deductive and comparative logics in regard to the history and architecture of classical cities. The idea that artifacts are tangible education is not new. John Summerson writes "the greatest French theorist of the nineteenth century–Eugène Viollet-le-Duc–spent most of his life elucidating Gothic architecture" [Summerson 1970, p. 76]. He wrote a famous book in which he described an imaginary city to recount the evolution of rules and customs of urban societies since the end of the Roman Empire [5].
He thus underlined how the successive transformations of artifacts are inherent consequences of events, trends, facts of a context. Viollet-le-Duc's idea to build a city that would include the invariables of all the post-Roman cities in Europe seemed an excellent source of inspiration for our reflection.
When studies on architectural heritage insist on representing and understanding the development of man-made structures, not only the key moments of their evolution should be considered, but it would also be necessary to describe the entire process of their transformation.
Today, historic artifacts are increasingly considered (or at least it is hoped that they are) attractors for our cities: physical points of reference as well as symbolic ones.
They act as tangible traces of a broad conceptual notion: the passing of time and the metamorphosis of societies and cultures that that place has witnessed. And so, when wanting to analyze and to understand those artifacts, it is important to understand that we are dealing with time (historic time) and with architecture (architecture of stratification).
Those artifacts tell us what we were and what we have become, the transformations undergone and the influences assimilated.
The points of view of archaeologists, historians, anthropologists, architects, engineers, geologists, geographers and writers on historic artifacts necessarily integrate the numerous information assets which are capable of compensating uncertain and incomplete information embracing the long intervals of time that those architectural artifacts and those places have traversed, in an apparently uniform way, according to variable physical and temporal stratification.
Therefore, the key point regards the methodology with which we can better connect the ancient artifacts that we study with the information necessary for understanding the changes they have sustained.

Fig. 6. From temporal tables to the reconstruction of the past; images taken from the text on the ideal post-Roman city by Eugène Viollet-le-Duc [Viollet-le-Duc 1879].



Analysis and representation of timelines: the GAIA project

In a compelling dialectic between time and the physicality of architecture, time, in its unfolding, gives rise to mental spaces, to a representation that becomes an incessant and layered narrative.
The spatio-temporal reading of an architectural artifact is considered as a concatenation of events along which two types of links are alternated: the transitions (changes) and states (periods of stability, invariants).
The construction of drawings and models that over the years have been produced during the numerous researches on the theme of the classical city [6] is a database from which to draw, and that must be programmed according to specific, but also different, purposes.
One of these concerns the management of the dynamics of change in reference to the changes undergone by Magna Grecian and Roman urban structures.
Consequently, the structure of the timeline, in this case, is constructed on two complementary aspects:
- the description of the architectural structures (modeling and representation of architectural and urban artifacts) represented by the database;
- the reasoning on the changes through graphic schematic processes (visual chronological, geographic and thematic exploration - InfoVis).
Given a solid methodological context and efficient diagrammatic representations, it is necessary to work on the graphic representation in order to define information useful for understanding the phenomena of the transformation we intend to explain. It is important to identify, on the basis of 'families of artifacts' (urban dwellings, public buildings, access systems, connections, etc.), the temporal relationships useful for clarifying the evolutionary systems, and also able to fill any 'documentary gaps.'
In essence, this study intends to test and apply, in what we consider a visual assessment of the architectural modifications, a system for presenting information for comparison, invariants, contrasts and differences.
The GAIA project 'Young People for an Interactive Archaeology in Calabria' has been carried out in a collaboration between the Mediterranea University of Reggio Calabria (scientific director Francesca Fatta), the Superintendence for Archaeological Heritage of Calabria, Locri Museum (referent Rossella Agostino) and MAP/CNRS Research Laboratory (Unitè Mixte de la Recherche / Centre National de la Recherche Scientifique / Ministère de la Culture et de la Communication) that deals with the development of models and simulation tools in the field of architecture and historical heritage (referent Livio De Luca) [7].
The GAIA research topic is digital visualization, as a representation of a no-longer-existing past, presenting a study as an expression of a methodology that seeks to combine the informational aspects of digital visualization with scientific precision. All to the benefit of an enlargement of the field of representation, which assumes a greater consistency: maps, orientation schemes, 3D modeling, views commented by sectoral instruments, and by specialized systems in several technical and scientific areas that become linguistic dissemination.
A diachronic analysis of architectural modifications can be useful to the general public, thus able to quickly learn a few themes of the history related to the classical city and architecture; it can be a valid support in a museum or another place of culture for the acquisition of specific

Fig. 7. The reference scheme: the City of Vitruvius by B. Galiani, 1758. The wind rose is the basis for the layout of the Vitruvian city.

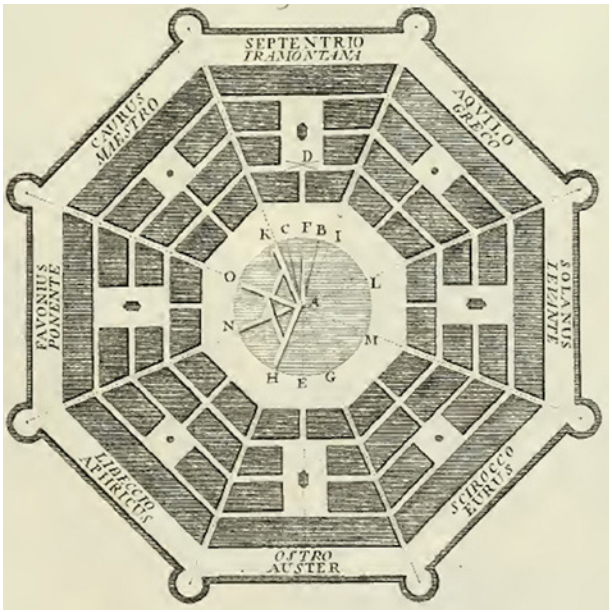


Fig. 8. Playing cards. Uncle Sam's Game of American History, New York 1851 and C.E. Morey, A New Game on the History of England, New York 1853.

Fig. 9. GAIA (Young People for an Interactive Archaeology in Calabria) an Edutainment program: Playing cards for the stoà, the theater, the Centocamere area and various objects from the National Archaeological Museum of Locri. AUGMENT augmented-reality app.

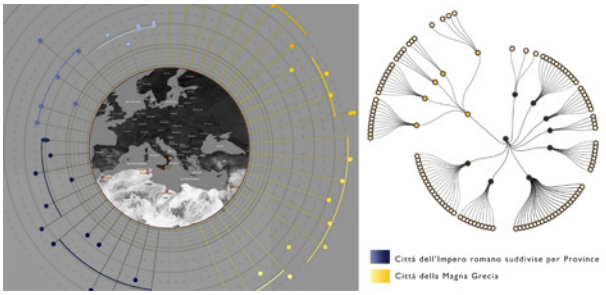
information on some historical moments, at various stages of their transformations over time. A specialized audience, instead, will be prompted to rethink the places of the classical city, with the continuous implementation of more specific information.
These readings can be used to implement a multimedia section to be allocated to museums and antiquaria for the study of the classical city and architecture through AR and VR systems, and prototyping of models; for the organization of cultural initiatives to enhance dialogue, cooperation and solidarity between the Mediterranean civilizations.

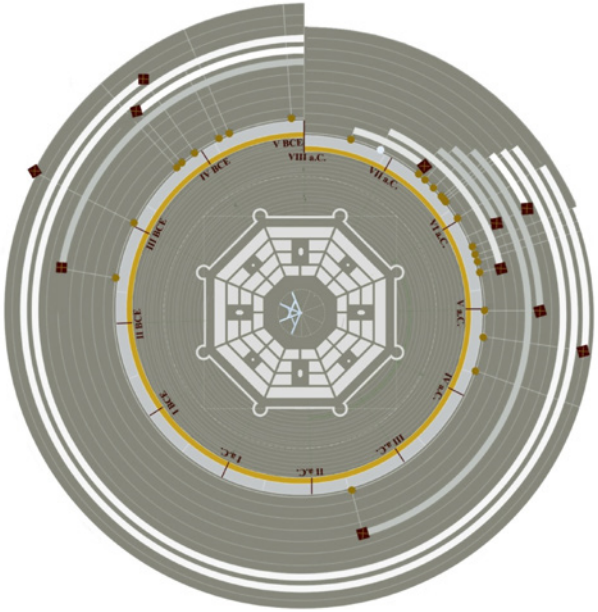
The design of a timeline for the description of the classic city

In the introduction of the research, some basic questions were raised in reference to the context and the methodologies to be implemented, or how to explain, in a scientific way, the invariant structure of the classical city, both Roman and Hellenistic, to the public of museums and places of culture, and especially to the very young people who are approaching the world of archaeology for the very first time. The results obtained in this experience are intended to give an answer to this question, starting from the experiences carried out experimentally in some Italian and French archaeological museums which also disclosed their content through the web.
Advanced technology, computer graphics and multimedia content are often united in the formalization of a whole new visual language, which does not mean betraying the scientific assumptions taken as reference. This is why the partnership between researchers in the different fields of archaeology, computer graphics and communication, and technologies in the field of survey and modeling has been able to capitalize on the experimentation presented here with the idea of activating a museum didactics section at the Archaeological Museum of Locri, in Calabria, that will provide a model for other museum sections, capable of activating network exchanges with other museums in the Mediterranean area.
The binomial protection / virtuality is frequently emphasized because it is believed that the idea of a good use of cultural heritage must be programmed, as already noted, through a widespread information system communicated through the web and disseminated through small and efficient museum facilities present on the territory pertaining

to the referring site, and which have a specific consideration for their youngest visitors.
A site, especially if not widely publicized, should first and foremost relate with other similar sites and design a common information network capable of becoming an 'attraction system' for tourists, scholars and visitors through a program of education and innovative entertainment. This has been the goal of the GAIA project, that identifies, in drawing, a role of cultural and scientific mediation, as a vision, representation, communication according to multiple approaches.
The GAIA project provides two distinct paths of consultation for gaining knowledge of Roman and Magna Grecian cities. In the first path, playing cards suitable to be manipulated by children were designed, on which the most significant and characterizing presences of the archaeological site of Locri Epizephyrii are represented (the theater, the temple and the stoà), as well as the characteristic areas of Centocamere and several objects conserved in the museum. The 3D Augmented Reality App applied to these playing cards allows students to gain access to the data sheets of the archaeological monuments of the Locri Epizephyrii site thanks to markers applied to the images. It is also possible to understand a find or a 'tomb furnishing' in their original form created with 3D models that will appear, on request, on a tablet. 3D models of the reconstruction of archaeological ruins and furnishings were carried out according to reliable scientific references.
The models allow young visitors to choose an educational path according to their preferences: the name of the object, the time of its creation, its use and much more, thanks to descriptive images and films, as well as a three-dimensional model of the reconstruction [8].
This way of viewing the objects in the museum is not a replacement for an on-site visit, rather it is designed to complement it and arouse curiosity and expectations. With these applications, young people will be the direct protagonists of the order of what they choose to see and not passive viewers in a tour of the museum.
The second edutainment path is called the Wheel of Time, an interactive multi-touch spiral graphical model that contains and identifies, in a chronological hierarchy (which goes from the seventh century BC to the fifth century AD), a list of Roman and Magna Grecian archaeological sites. This permits an analysis of the urban structure of ancient cities in reference to the main urban areas and the most important architectural works, and in relation to the

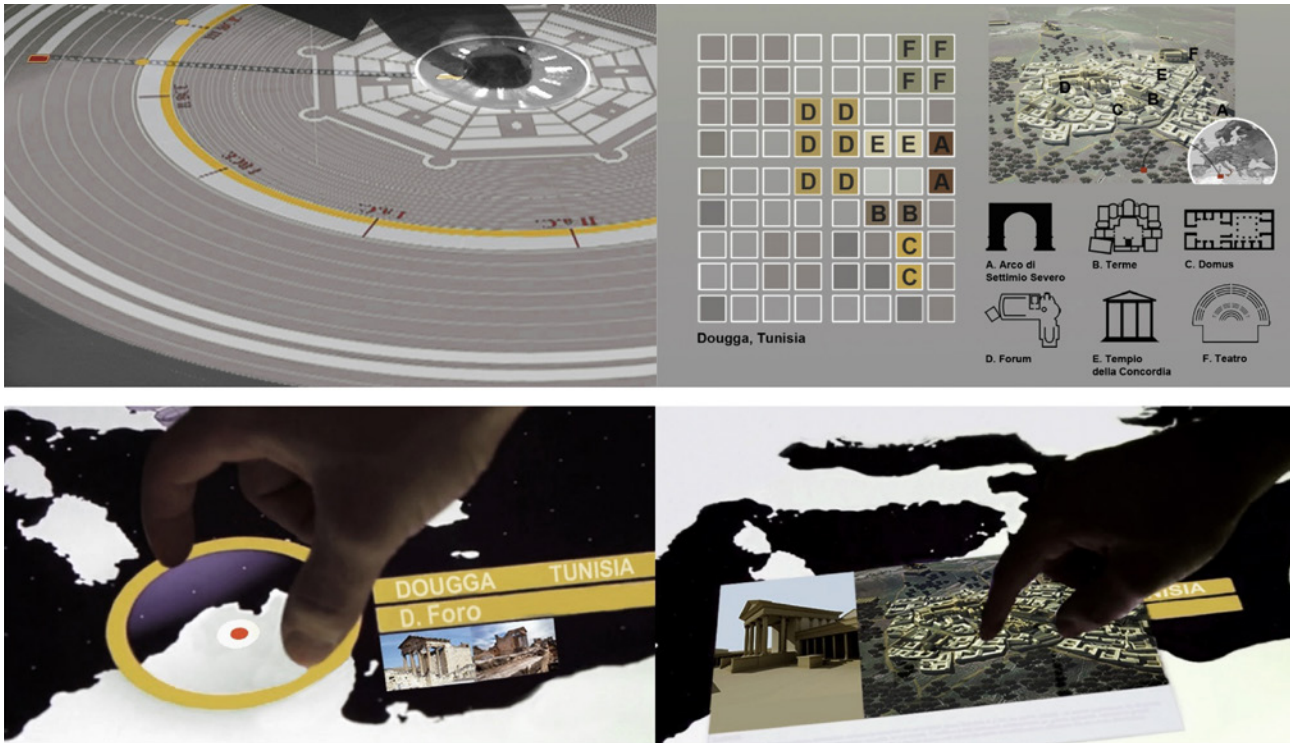
Fig. 10. GAIA Interface. Graphic diagram of the interactive Wheel of Time model with the Vitruvian city at the center.





invariants of the Vitruvian city (urban configurations, public buildings, specialized architectures, domus).
Traditional drawing and infographics were joined by other powerful expressive and communicative media such as computer graphics and digital modeling. The cities visualized in the Wheel of Time are: for the Magna Grecia, Locri Epizephyrii, Sibari, Selinunte; for the Roman Empire, Volubilis, Dougga, Leptis Magna, Jerash [9]. The primary object constructed for navigation is a wheel which represents the city of Vitruvius, taken from the text *Vitruvius Pollio. Ten books on architecture* (1914). This represents a synthesis of the idea of the classic city. The "Wheel of Time" allows a chronological overview where the cities are located in time and space by 2D and 3D codes. The "Wheel of Time" thus becomes an educational game able to develop correlations between places, architecture and objects, all distant in space and time, but nevertheless related to the geographical and cultural Mediterranean area. This contribution does not intend to set an objective, but to propose a reflection. In this case, the interdisciplinary approach that integrates information technologies and architectural modeling at different scales uses the modélisation informationnelle methodology. This method aims to improve management of data with respect to their visualization regarding the temporal transformations of architectural artifacts of historical and archaeological heritage. In this way, the rules for the creation of 2D and 3D charts are designed as scientific tools for investigation and visualization.

Fig. 11. GAIA Interface. Visualization of a square matrix representing the Roman city of Dougga, Tunisia, with the identification of the main monuments, the virtual reconstruction of the Forum and of the town in the III century B.C.



Conclusion

The objective of reading a specific urban transformation in a broader perspective prompts a reflection on how the image of an architectural heritage artifact highlights the identity of a community and the culture of reference [10]. Designing a game based on scientific fundamentals that examines cultural heritage with 3D systems of virtual reality, augmented or mixed, imposes a guarantee of the quality of information, creates a dialogue between the aspects of historical knowledge and the ways of using spaces and introduces an important criterion of novelty and experimental innovation for the knowledge of the classical city, especially for young people. This research shows that abstraction and figuration can be alternative or additional ways of representing cultural heritage.

Notes

[1] An example is given by the ChronoZoom project, an open source initiative, conceived by the famous geologist Walter Alvarez, together with Roland Saekow, for a free software capable of providing effective interactive representations of sequences of events on the broadest possible time scale from the Big Bang to the present day.

[2] One timeline (from the Creation to 1753) is fifty-four feet long, mounted on turning cylinders and enclosed in a case. Another uses the different parts of the human body to show the genealogies of Jesus Christ and the sovereigns of Saxony. The diagrams created by 18th-century missionaries to convert Indians in Oregon ordered Bible stories in vertical columns. There is also the North Atlantic communication chart of Marconi's telegraph, dated April 1912: it reported where a ship was located, at each moment, in relation to other ships, and not by their geographical position; one of these was the Titanic. There are also little-known works by famous personalities, such as the historical chronology by the mapmaker Gerardus Mercator or a mnemonic board game patented by Mark Twain.

[3] The project is connected to the H2020 objectives of the *Line 2 Competitive Industries and, specifically, Content Technologies and Information Management. Technologies for Language, Learning, Interaction, Digital Preservation*, also with precise connections to the funding Line 1 Excellent Science, which supports research in ERC (European Research Council) sectors referring to Cultural Heritage.

[4] The purpose of the GAIA research project is to organize an activity of technology transfer and applied interdisciplinary research related mainly to the sector of Social Sciences and Humanities, also with the aim of promoting, through the use of emerging technologies, the development of ICT applications for surveying, cataloguing and digital preservation, study, dissemination, disclosure, innovative use and sustainability of the archaeological and architectural heritage object of the research.

[5] Eugène Viollet-le-Duc analyses military history and techniques of fortification through events concerning the fictional town of La Roche-Pont from the Roman age to the Franco-Prussian war. See the complete edition: Viollet-le-Duc, 1879.

[6] See volumes *Spazi* e *Culture del Mediterraneo*, published between 2008 and 2015, outcomes of the PRIN research coordinated by Massimo Giovannini.

[7] The GAIA research project, which lasted 18 months, was implemented by Manuela Bassetta, postdoctoral researcher for the project, who spent 8 months at the MAP-CNRS headquarters in Marseille under the guidance of tutor Jean-Yves Blaise, and 10 months at the Department of Architecture and Territory of the *Mediterranea* University of Reggio Calabria, with periodic internships at the Locri Museum.

[8] The survey techniques used range from laser scanning to photo-modeling. Among the software available on the market, the experimentation was conducted with Agisoft Photoscan. For Augmented Reality, Metaio software was used.

[9] The 3D theoretical models of the virtual reconstructions of Magna Grecian and Roman cities were elaborated within the scientific research PRIN 2009-2011 *Costruzione di un Atlante del Patrimonio Culturale Mediterraneo*. Title of the specific research: Progetto di un sistema interattivo per la conoscenza e la gestione del patrimonio culturale mediterraneo, coordinated by Prof. Francesca Fatta.

[10] In this research, the contribution of the research method of *modélisation informationnelle* by J.Y. Blaise is seen. Informative modeling is an interdisciplinary approach that integrates information technologies and analytical issues of architectural modeling at different scales. The application field regards historical and archaeological heritage, and its roots are found in the field of architectural modeling, imaging, data management and scientific visualization.

Authors

Francesca Fatta, Department of Architecture and Territory, *Mediterranean* University of Reggio Calabria, ffatta@unirc.it
Manuela Bassetta, Department of Architecture and Territory, *Mediterranean* University of Reggio Calabria, manuela.bassetta@unirc.it

References

Blaise, J.Y., Dudek I. (2011). Understanding Changes In Heritage Architecture. Can we provide tools & methods for visual reasoning? In Proceedings of the 11th International Conference on Knowledge Management and Know-ledge Technologies. Article No. 45. Graz, 2011, September 7-9.

De Luca, L. (2001). Methods, formalisms and tools for the semantic-based surveying and representation of architectural heritage. In *Applied Geomatics*, vol. 6, Issue 2, pp. 115-39.

Giovannini, M., Arena, M., Raffa, P. (eds.). (2015). *Spazi e Culture del Mediterraneo. Costruzione di un Atlante del Patrimonio Culturale Mediterraneo*. Vol. 4. Napoli: La scuola di Pitagora editrice.

Giovannini, M., Colistra, D. (eds.). (2006). *Spazi e Culture del Mediterraneo. Architettura e luoghi del Mediterraneo*. Vol. 1. Roma: Edizioni Kappa.

Giovannini, M., Ginex, G. (eds.). (2008). *Spazi e Culture del Mediterraneo. Architettura e luoghi del Mediterraneo*. Vol. 2. Roma: Edizioni Kappa.

Giovannini, M., Prampolini, F. (eds.). (2008). *Spazi e Culture del Mediterraneo. Luoghi Mediterranei*. Vol. 3. Reggio Calabria: Edizioni Centro Stampa d'Ateneo.

Gros, P. (2010). *Storia dell'Urbanistica. Il mondo romano*. Bari: Laterza.

Redde, M., Golvin, J.C. (2008). *I romani e il Mediterraneo*. Roma: Istituto Poligrafico dello Stato.

Rosenberg. D., Grafton, A. (2012). *Cartographies of Time*. New York: Princeton Architectural Press. [Ed. it. *Cartografie del Tempo* (2012). Torino: Einaudi].

Serres, M. (1993). *Le origini della geometria*. Milano: Feltrinelli.

Summerson, J. (1976). *Il linguaggio classico dell'architettura*. Torino: Einaudi.

Viollet-le-Duc, E. (1879). *Le Siège de La Roche-Pont. Texte et dessins par Viollet-le-Duc*. Paris: Petite Bibliothèque Blanche. <http://gallica.bnf.fr/ark:/12148/bpt6k6536640p> (consulted on April 27, 2016).

Vitruvius. (1914). *The ten books on architecture*. Cambridge: Cambridge University Press.

Zerubavel, E. (2005). *Mappe del tempo. Memoria collettiva e costruzione sociale del passato*. Bologna: Il Mulino.