A retrospective on GIS and AIS platforms for Public Archaeology in Italy. Searching backward for roots and looking onwards for new methodological road-maps.

Serlorenzi M., Jovine I., Leoni G., De Tommasi A., Varavallo A.

Special Superintendence for Colosseum, National Archaeological Museum and Archaeological Heritage of Rome
Ministry for Cultural Heritage and Tourism of Italy
mirella.serlorenzi@beniculturali.it, ilaria.jovine@beniculturali.it, giorgia.leoni@beniculturali.it,
adt.andrea.detommasi@gmail.com, andrea.varavallo@beniculturali.it

The state of the art of Geographical Information Systems and Archaeological Information Systems developed with public resources for the archaeological knowledge management, calls common attention to a deeper understanding of new AIS web platforms as "places" of multi-domain integration and collaborative processes.
This paper presents the preparatory phase of an analytical work arised in the context of the SITAR Project, the first digital archaeological cadastre of Rome, and focused on the evolution and revaluation of AIS in the Public Archaeology domain. Some early considerations are proposed with respect to: a philological retrospective on public AIS, with a particular attention to the italian scenario; a first evaluation of real correspondance levels between typical cartographic/GIS environments, semantic/interpretative tools, and systems for analysing and mapping scientific data and informations; a first AIS subdomain basic ontology; finally, a proposal for a new AIS platforms declension with regard to their roles in Public Archaeology.

1. Introduction

The state of the art of Geographical Information Systems (GIS) and Archaeological Information Systems (AIS) developed with public resources to manage complexity of archaeological knowledge, calls attention of institutional, academic and professional communities to a deeper and more aware understanding of the cultural values – including also open issues[1] – acquired in last decades by these specialized Information Systems. Effectively, a new attention seems to be paid to knowledge processes refinements, methodological evolutions, technological enhancements and innovations that have began to characterize Public Archaeology and its social roles since the last decade, also thanks to a wide diffusion of AIS platforms as new "places" of integration between scientific domains and territorial managing and planning actions.

In this sense, our preparatory work looks at the epistemological opportunity to reconsider ideas, concepts, ontologies, methods, technologies, know-how, opening vs. closing trends, all underpinning both to fallen or still alive projects, pilot experiences or simple feasibility studies. Moreover, a particular interest is dedicated to those projects promoted by public institutions. Therefore, this early contribute tries to "travel" through historical and theoretical backgrounds, different cultural policies,

scientific and technological references, logical and procedural architectures, concrete achievements and their effects on the evolution of archaeological research and knowledge, both in past and present time.

This work arises specifically in the context of the SITAR Project[2], the experience of public archaeological knowledge management that has been promoted since 2007 by the Special Superintendence for Colosseum, National Archaeological Museum and Archaeological Heritage of Rome (SSCol), a territorial institute of italian Ministry for Cultural Heritage and Tourism of Italy (MiBACT). Carried out to realize and maintain the first digital archaeological cadastre for the metropolitan territory of Rome (Serlorenzi and Leoni, 2015), from the beginning SITAR has been implemented as an AIS web platform. Actually, it is being developed and populated in order to rapidly reorganize, manage and represent the complexity of knowledge about Rome archaeological heritage, in multiple ways, for many different users and through suitable web media.

These are fundamental reasons for which our project workgroup's, first of all, has to become more aware of direct and indirect derivations of SITAR theoretical framework from mentioned past experiences, as its roots. In this sense, the purpose is to better steer all continuous methodological and technological developments of

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[1] In this sense, "concepts" themselves are seen and employed as epistemological means bearing hypothesis and not only investigated as subjects of the research (Margiotta, 2011, p. IX-X).

[2] The italian acronym SITAR means "Archaeological Territorial Infomative System of Rome"; see at http://sitar.archeoroma.beniculturali.it/.

SITAR, also to share our approaches and observations with other researchers and colleagues.

In that direction, this paper presents some early considerations articulated in the following paragraphs with respect to: a proposal of a potential approach to a philological retrospective on public AIS systems in Italy; a first evaluation of their role in theoretical and methodological innovation of Public Archaeology; the definition of an early basic ontology for AIS domain, in order to reconsider main knowledge elements to be analyzed in each project; finally, a brief proposal for a new AIS platforms conceptual declension, towards a clearer recognition of their common theoretical and methodological roots and specific roles in Public Archaeology domain.

2. Towards a retrospective on italian public AIS: an approach proposal

The attention paid within SITAR Project to continuous innovations in GIS and AIS platforms development and their integration into other cultural domains, represents the starting point for our retrospective approach. In this sense, it seems to be relevant the active participation of SITAR Project in some italian and european archaeological networking experiences, such as: committees and workgroups promoted and coordinated by MiBACT since 2007, in the field of GIS, AIS, Spatial Data Infrastructures (SDI), Open Data and Preventive Archaeology; the two ongoing european projects ARIADNE – "Advanced Research Infrastructure for Archaeological Database Networking in Europe" (Niccolucci, 2014)[3] and DCH-RP – "Digital Cultural Heritage Roadmap for Preservation" (Justrell and Fresa, 2014)[4] ; and also some other valuable cooperations with Universities and Research Institutions as the National Research Council of Italy - Department for Social Sciences, Humanities and Cultural Heritage (CNR-DSU); the italian Agency for New Technologies, Renewable Energies and Sustainable Development (ENEA); the Consortium GARR, the managing body of "GARR-X", the Italian National Research and Education Network (NREN).

Due to this specific institutional perspective, our early analyses will pay a special attention to those initiatives promoted in last decades by MiBACT and implemented in the two prevalent paradigms of the so-called Cultural Resources Management (CRM) systems and more recent AIS platforms. Our work will begin from those projects undertaken since mid 1980's, on the wave of so-called "giacimenti culturali" (cultural deposits), in light of the legacy left by those pioneers experiences to descendant initiatives and early applications in the public archaeological sector. The aim is to revaluate various effects of those projects on involved communities as, first of all: the 1990's GIS and AIS outbreak and diffusion,

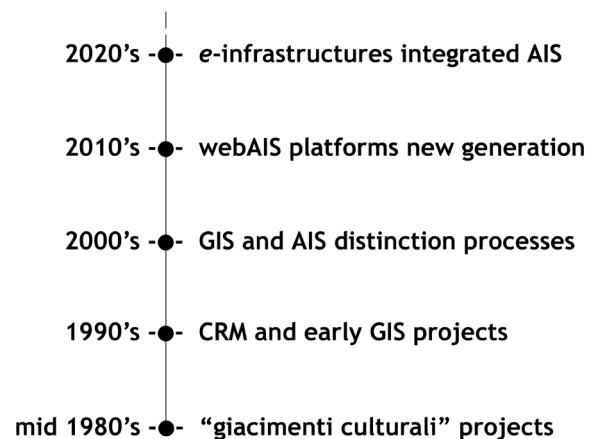the domain language formalisation and the birth of last generation of public information systems (fig.1).

Figure 1: *Time-line of GIS and AIS evolution path in italian Public Archaeology (source: SITAR Project)*

Therefore, a foundamental step for this work is to trace now – and to deepen in future – the origins of GIS and AIS applications in public italian archaeology, experimenting a philological approach: dealing with various projects, experiences and feasibility studies, each one quite as a "textus", the relationships between epistemological/methodological evolution of Public Archaeology and specific coeval technology scenarios, may be analyzed and mapped to point out the most relevant elements of knowledge. In this direction, our work will attempt to an early discriminating evaluation of failures and successes, sharing and diversifications of approaches and methods, natural aggregations between institutions, expertises specialization processes, and so on, all of them as perceived through literature analysis and, above all, by a direct observation of the Public Archaeology current scenario. In our actual perspective, the mentioned cultural and technological elements to be analyzed, may be primarily observed across some paradigmatic case study such as national cultural Information Systems, regional or local AIS and also SDI, like those ones developed in many cities and regions of Europe, in last years. Nevertheless, other GIS and AIS projects, even if less complex, could be considered as precious contributes to our early reflections[5].

For the purposes of this paper, we look at CRM, GIS and AIS applications - already well known subjects of thematic literature, specifically observed in specific surveies and analysis since the 1990's (Moscati, 1998; Djindjian, 1998; Scianna and Villa, 2011) - as three items integrating each other (figg.2, 3) and, in some cases, as consecutive stages of GIS approach evolution in Public Archaeology domain

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[3] See at http://www.ariadne-infrastructure.eu/.

[4] See at http://www.dch-rp. eu/.

[5] In view of deeper analysis of scientific and technical literature, all resources and papers consulted in this phase have been primarily selected among those ones directly available from following on-line journals and repositories: Archeologia e Calcolatori, CAA Proceedings web site, Journal of Computing in Cultural Heritage, ResearchGate, Academia.edu, Fasti on-line. The queries for resources selections have been based on some basic keywords as "GIS", "AIS", "Archaeological GIS", "GIS+Archeologia", "SIT" (in italian: "Sistema Informativo Territoriale"), "IDT" (in italian: "Infrastruttura Dati Territoriali"), "SDI", "Spatial Archaeology", "Spatial Analysis", "Digital Libraries", "Open Data", "Public Archaeology".

(Harris and Lock, 1995)[6]. So, with the acronim AIS we will generally refer both to so-called archaeological GIS applications and more complex public archaeological information systems. In particular, among various definitions of AIS, as avalaible in literature, we look at those ones explicited in Gillings and Goodrick (1996), Arroyo-Bishop (1998) as "the use of the GIS structure to base the Archaeological Information System (AIS)", Djindjian (1998, 2012), Cavulli and Grimaldi (2005) and also to the reflections formulated by Carver (2005).
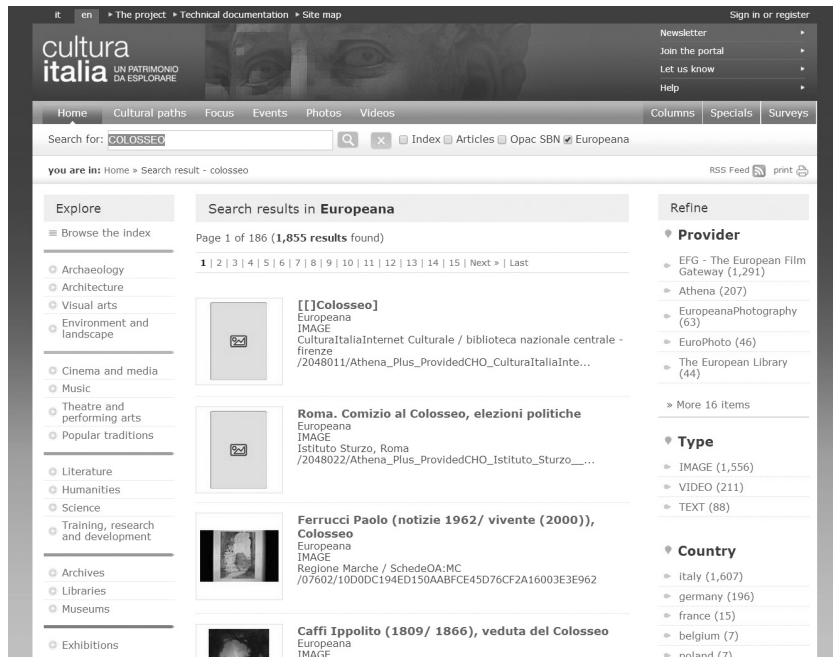

Figure 2: *An example of information comparison between CRM and AIS: a query for "Colosseo" within CRM system "CulturaItalia.it" (source: Ministry for Cultural Heritage and Tourism of Italy)*

In such retrospective, it seems to be fundamental the adoption of a mapping approach among: theoretical paradigma; logical, phisical and semantical objects; technical tools and systems; digital infrastructures[7]; and so on. Indeed, our first aim is to describe an early basic ontology of the "historical AIS landscape" and analyse its current multiple representations in form of various digital platforms dedicated to Public Archaeology, with a particular attention for recent spreading and evolution of public AIS web platforms. In other words, it will be attempted to implement a metaphorical "GIS of AIS" by means of which to map and query some primary "knowledge layers" related to ideas, concepts, know-how, approaches, methods, ontologies, technologies, persons, etc., involved in this specific kind of technological applications.

Figure 3: *An example of information comparison between CRM and AIS: multi-representation of Colosseum spatialized and descriptive data in SITAR webAIS platform (source: SITAR Project)*

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[6] With respect to the evolution of these information system declensions, the statistics on use of such terms as "GIS" and "CRM" supplied by the online journal Archeologia e Calcolatori, appear very interesting to suggest the underpinning trends. See at http://soi.cnr.it/archcalc/overview_classification.htm.

[7] For this specific topic, the outcomes of the survey "Research Infrastructures for Cultural Heritage in Italy - 2014" carried out jointly by MiBACT and Consortium GARR, will appear very relevant. See at http://www.garr.it/a/comunicazione/notizie-dal-garr/news/743/.

3. "What, where, when" isn't ever visually equal to "who, why, how"

The literary metaphor offered by José Saramago through his tale "O Conto da Ilha Desconhescida" seems to be a nice figurative pass key to introduce our early rereading of GIS and AIS history in Public Archaeology, and also to approach to the definition of a basic ontology for these applications. In the mentioned tale, a no-named main character – who, metaphorically, could be also an archaeologist – asks to a "king" – which may be seen as a personification of any epistemological value and issue – of an elsewhere "kingdom" – for our perspective, the archaeological domain – for a "boat" – it may be seen as an expert system based on methods, processes and tools – to reach an "unknown island" – that could represent finalities of the research itself, as they are not ever completely claryfied or defined from the beginning. That island seems not to be reported on kingdom official maps and therefore not to exist, as the vexed king answers to the protagonist. Indeed, that is really the unique reason for which it is "unknown", as the protagonist replies to the king; but, at the same time, according to him that element doesn't appear enough to declare the unknown island not existing. Seeing this scene, others people begin to shout to the king "Give him the boat!" and so finally the man achieves his purpose and can begin preparations for sailing away from the kingdom harbour, neither having a crew on board nor being himself both a sailor and an expert captain. Then, the tale switches to a dreamlike dimension that makes the protagonist understand the "real" unknown island he was looking for, it is effectively the boat itself. Suddenly, in the dream, the little ship begins to change itself in a sailing flourishing garden.

For our analysis context, that pleasant literary metaphor seems to offer two main suggestion elements. The first one is the focus oriented just so on the rediscovery of richness and potentiality of the "medium" itself, once the researcher has gone on board, obviously. Indeed, that seems to be happened also in the case of AIS platforms, if we consider the path of their breakthrough and widespread success in archaeological domain. Looking from this metaphorical perspective, therefore, the AIS diffusion could be better understood also beyond pervasive availability of software and hardware, and ICT, 2D/3D web mapping and other abilitating technologies.

At the same time, the metaphor suggests another fundamental issue related to ambiguity of the concept of "official map", today more than in the past: it is clear, indeed, that the same "institutional map" couldn't ever represent enough informations for all users, their own "mind road-maps" and imaginations; nevertheless, as a "public datum" the official mapbases should be ever considered as a topic starting point to discover – or better, re-discover – all unmapped items and create different visual representations of new data, theories, scientific discoveries and "consciousness layers", we can say; in other words, to materialize all new personalized and shareable "unknown islands".

With regard to both these reading levels and questions underpinning to title of this paragraph, it may pointed out, on one hand, the importance to revaluate roles of advanced information systems in Public Archaeology evolution path, in processes of circular knowledge creation and in continuos innovation of historical disciplines; on the other hand, new declensions of AIS platforms have to address the current gaps between needs of an "official representation", in geographical terms, of Public Archaeology and characteristics of "personalized maps" being produced by different users.

Particularly, the latter question refers specifically to real correspondance levels between typical visual/cartographic systems and semantic/interpretative tools/system for mapping and analysing activities, especially needed in social sciences and humanities. Indeed, while the first ones are essentially based on typical graphic combination of three primary topics as "what", "where", "when" and conventional data representations, the latter instruments are more extended across interpretative concepts as "who" (persons/societies), "why" (functions/cultures), "how" (technologies/processes), moreover across all different epochs (fig.4). This is an epistemological issue, furthermore, that has been already noticed and discussed by many authors (Castelford, 1992; Arroyo-Bishop and Lantada Zarzosa, 1995; Barceló and Pallarés, 1996; Gardin, 2002; Conolly and Lake, 2006, pp.8-10; Constantinidis, 2007; De Runz et al., 2011; Kondo et al., 2011; Desjardin, Nocent and De Runz, 2012; Djindjian, 2012) and has been stressed also in the political geographical domain by means of some interesting theoretical assertions (Forest, 2004).

4. Searching backward for roots through a basic ontology of AIS subdomain

Starting our first overview on AIS applications from these premises, the metaphor kept from Saramago's tale may give us a simple but useful suggestion to approach and describe a basic ontology through which analyse AIS case studies and trace our early theoretical reflections. In order to point out the more interesting key defining features and knowledge elements of that "landscape", the following aspects have to be considerd for describing a primary analytical matrix:
– the specific archaeological domain, obviously, containing and identifing theoretical and methodological needs and approaches, processes and procedures, scientific finalities, values and issues, tangible and intangible archaeological heritage items and all their translations into digital objects; this domain appears as the "kingdom" in the mentioned literary metaphor, representing the "territorial context" for our retrospective and so the "spatial extension" of our attempted "GIS of AIS";
– the human actors, involved and interacting in AIS applications in both institutional/collective and individual forms, with their own "mind road-maps" and specific needs

to be expressed and satisfied within new participatory knowledge processes (as for protagonist and people of the tale);

– the epistemological values and open issues, as factors impeding or stimulating and allowing new research, achievements and awareness (as the king makes, before denying unknown island existence, then conceding the boat);

– the abilitating technologies and methodologies, as media allowing to us to reach new scientific and cultural outcomes, and becoming themselves new research subjects (as it happens metaphorically to the boat in the tale);

– the seeked object, as data, informations and more generally knowledge, "waiting" for being achieved, analyzed, organised, shared and re-thought through scientific and cognitive processes, towards new augmented and participatory knowledge (as the unknown island, not ever officially mapped, but anyway existing and reachable).

As said above, the definition of that simplified ontology appears as a mandatory activity to approach and steer our preparatory work to better describe and analyse all the different conceptual instances and characteristic of AIS subdomain.
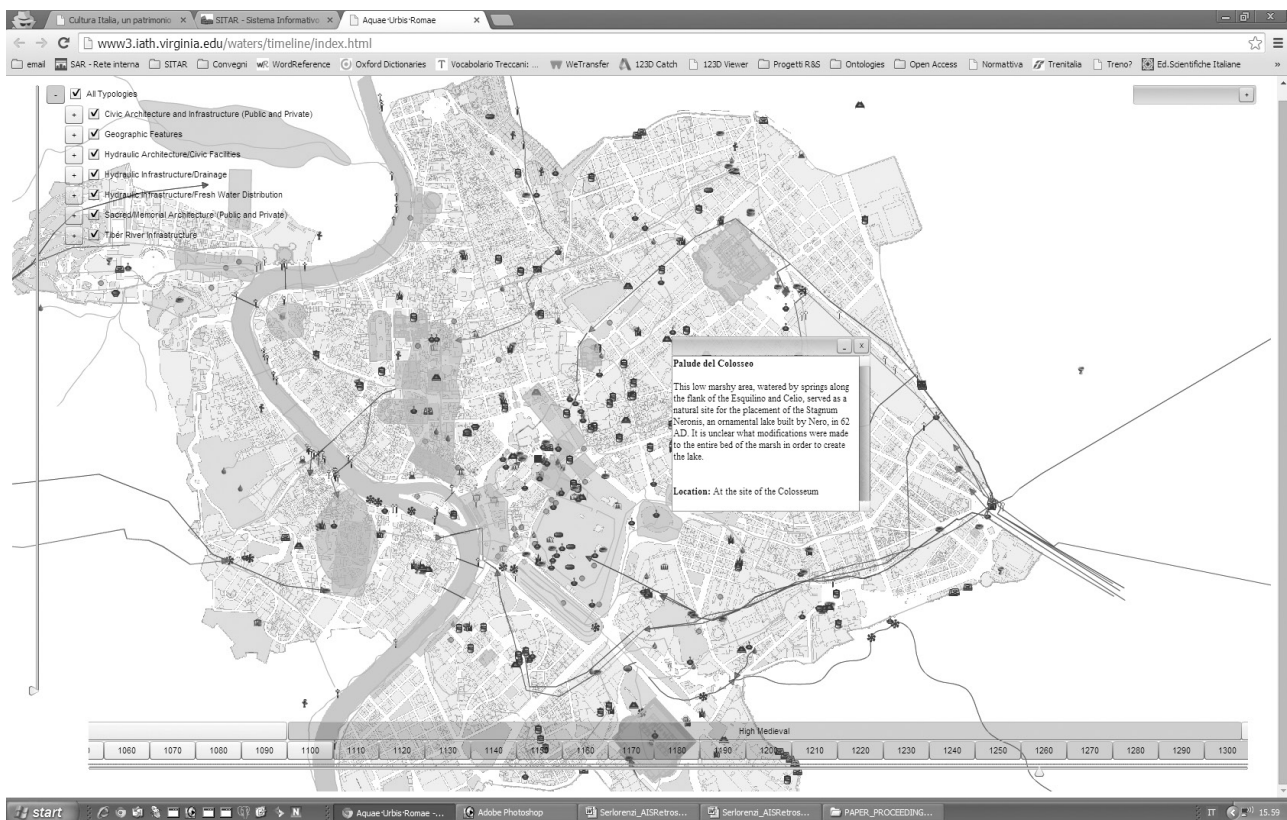

Figure 4: - *Mapping temporal dimensions: a thematic web map of hydraulic infrastructures and facilities in early medieval period at Rome, represented through the webGIS of "Aquae Urbis Romae" Project*
(source: Aquae Urbis Romae Project, http://www3.iath.virginia.edu/waters/)

5. Towards a GIS-oriented collation of public AIS platforms

In our perspective, it may be attempted a GIS-based collation of primary case studies to be analyzed among public italian AIS projects. So, being also inspired by the initiative for the creation of an "Observatoire des pratiques géomatiques dans les organisations de l'Archéologie" in France (Costa, 2012), the first step in implementation path of our expected "GIS of AIS" is represented by an usual census survey, newly started and still in progress at this moment. In this direction, the real effort should be to go beyond the typical data-entry of identifying informations, both spatial and descriptive, and towards a deeper understanding of cultural elements represented by each project and experience. So, for purposes of this

paper it seems more useful to express some theoretical considerations rather then to examine in technical details our collation work just started, that would be detailed in next publication places.

As in a usual GIS application, first of all it is necessary to set the extension of the context in which to map, analyze and aggregate all interesting "datasets" corresponding to each project, experience or feasibility study, both fallen and still alive. In this sense, the "territory" to be analyzed is effectively the Public Archaeology scenario, notoriously studded with different institutional mission profiles, professional figures, methods and above all with heterogeneous visions. Already noticed by Wilcock in 1973 as a "'bridge subject' between the two cultures of arts and sciences", Public Archaeology is now characterized by many different and shared instances of improvement and

exploitation of its social finalities and values, particularly aimed to align archaeological discipline and professional sector with the digital society rapid evolution, fluidity and strategic challenges.

Moreover, new trends and applications are bringing the whole sector to a stronger comparison with knowledge society trends, towards new declensions of archaeological discipline, such as the "open archaeology" (Serlorenzi, 2013; Costa et al., in press). These most innovative items are, e.g., 3D GIS (Harris and Lock, 1995; Scianna and Villa, 2011) and 4D GIS (Castelford, 1991; Constantinidis, 2007; Johnson, 2008), preventive archaeology researches, "archaeological potentialities" analysis and mapping (Cavazza, 2014), interdisciplinary integration e innovation (Campana and Forte, 2006), shared re-thinking of approaches, methods and procedures (Niccolucci, 2014), and also many valuable inputs and opportunities coming from socializing web platforms and tools. Furthermore, in the last decade the role played in the GIS applications field by "industrial" actors in managing and supplying georeferenced, personalized and socialized knowledge contents, has pulled also archaeological communities towards new processes and ways of data production, sharing and dissemination, often speeding up digital growth of institutions and involved persons - especially in terms of competences and outcomes - and engaging of new audiences.

Within this reference framework, the effort of "collecting-for-rethinking" public AIS applications assumes a greater relevance also in order to deal with some historical distinctions between various declensions of specialized informative systems. For example, some residual methodological differences between CRM projects and more specialized GIS and AIS applications, require for a necessary integration on behalf of wider and more flexible platforms really capable to address new common needs of knowledge management, along with cultural and social values enhancement, for many institutional, academic and research actors and other stakeholders (Moscati, 2009; Aubry and Ferjani, 2012; Costa, 2012; Djindjian, 2012; Hofmann and Mani, 2012; Jensen, 2012, p. 212). Therefore, in this scenario the themes of organization and multi-representation of fluid and collaborative knowledge appear as two real priorities to be strongly developed indeed by means of a new generation of advanced information web platforms that may be derived from the full integration of GIS, AIS and SDI with Digital Libraries and Open Access repositories, as new forms of so-called "Geo-Digital Libraries" (Pozzo and Virgili, 2013; Pozzo, in press).

In the case of italian archaeology, public AIS projects appear to be still characterized by the legacy grown around experiences promoted by MiBACT in mid 1980s' and early 1990s', that have drawn the first operative framework in which traditional archaeological processes have gradually met and used potentialities of computer science[8]. In that same period, involved human actors have began to acquire new technological competences and public instances of Cultural Heritage management have been coupled gradually with professional/technical skills and competences of researchers, academic experts and private companies, giving birth to an important bi-directional comparison, even if not always complete and balanced. Anyway, those projects gave great impulse to circulation and adoption of multiple forms of data organization, knowledge representation and digital contents publication, particularly thanks to early descendant solutions based on web applications and GIS approaches and developed in various technological versions, firstly such as commercial desktop ones and more recently as free/open source and software-as-web-service platforms (Cantone, 2013; Serlorenzi, 2013).

With regard to this evolution framework, it may be generally observed that different MiBACT projects have maintained their own development paths across last decades and they are not still properly unified neither in a true ecosystem of web informative platforms, nor in a full integrated "cultural meta-system". This situation may be due to different development perspectives related to various involved scholarships, workgroups and especially to a certain fragmentation of methods, resources, systems and tools, that often have affected the final compliance of these systems with each project premises, real needs and instances of different users. In this sense, the fundamental role of post-implementation reviews (Clubb and Lang, 1996b; Arroyo-Bishop, 1999) has not been widely applied in these projects development stories, and consequently final users have not been ever well involved in fundamental assessment processes.

In our opinion, two fundamental reasons for projects success or failure cases seem to be recognized: the first one can be referred to same internal relationships between specific executive workgroups; the second one may be located at the level of crucial interactions between these actors and real final users of each on system. Furthermore, this fragmentation phenomenon seems to have also limited the attention paid to dialogue and relationships between various institutional, research and academic levels, two elements seen as allowing or impeding factors for a successful implementation of public information systems, as observed and stressed in recent outlines of two MiBACT Committees on National AIS development (Serlorenzi and Jovine, 2013), as well as in other european contexts during last decades (Clubb and Lang, 1996a; Arroyo-Bishop, 1998; Costa, 2012, p. 265).

Starting from these common premises and, less or more, parallel paths, the italian scenario has been enriched with many new methodological approaches and innovations that have been achieved and specialized within some AIS projects carried out in last years. Some of them have been extended up to a regional or wider scale (Hiebel and Hanke, 2008; Miele, 2011; Cavazza, 2014), while others have been limited to specific case studies of historical urban centres, or again just to single archaeological sites (Lazzeri, 2011; Keay and Earl, 2013). So each project

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8 A syntetic visual summary of that pioneering period has been traced by Biallo (2009), very useful to describe at a glance the main relationships between those early MiBACT experiences and primary descendant public AIS projects.

results more or less focused on a specific topic, for example the so-called "archaeological risk" or the "archaeological potentialities" analysis and mapping (Cavazza, 2014), or advanced data management. Particularly, with respect to AIS platforms dedicated to historical urban centres, there are some interesting examples to be mentioned for addressing crucial themes of updating, sharing and dissemination of data and knowledge, since the beginning of their development. These are distinctively the "SITAVR Project", the first digital archaeological cadastre for the urban center of Verona (fig.5), derived from SITAR data model and operational paradigma (Basso et al., in press); the "MAPPA Project", a stimulating institutional/academic

experience focused on management, web-sharing and dissemination of archaeological dataset, "archaeological potential" analysis and scientific knowledge about the ancient centre of Pisa; and, again, the "SIURBE Project" focused on integrated geo-archaeological knowledge of the historical center of Benevento, vehiculated through an AIS web platform (Santoriello, Rossi and Rossi, in prep.). Obviously, as said in the premises, many other italian relevant projects actually stud the national AIS constellation and all of them will contribute to our analysis and identification of cultural values and open issues related to the evolution of public archaeological knowledge platforms.
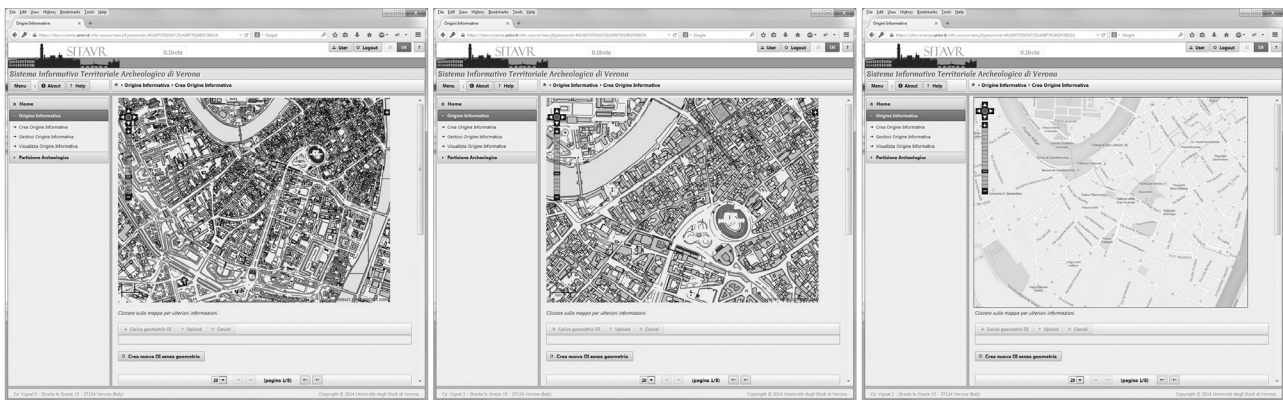

Figure 5: - *SITAVR project web platform and GIS environment (source: SITAVR Project)*

6. The case study of Rome

For our anlysis purposes, the case study of Rome appears as a "bridge" between the past of archeological mapping tools and the future of archeological knowledge management systems. Indeed, it represents a paradigmatic case study in light of its mosaic of different AIS applications developed in last decades by various institutional, research and academic actors. Undoubtedly for its own ancient history,

wide archaeological heritage well distributed in every part of the metropolitan territory and real complexity of its rapid urban, social and economical transformations, Rome has been the privileged subject of many archaeological mapping projects, since by those ones started and implemented by Rodolfo Lanciani between 1893 and 1901, by means of his famous "Forma Urbis Romae" (Lanciani, 1981) (fig.6).
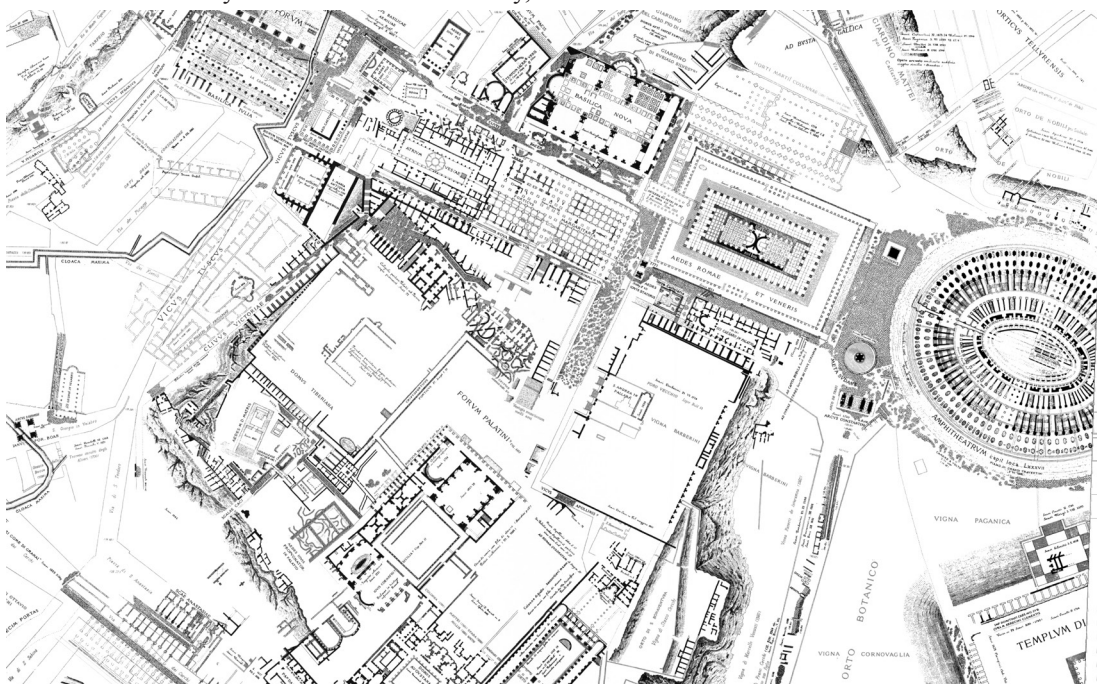

Figure 6: *A detail of the Forma Urbis Romae by Rodolfo Lanciani: the archaeological area around the Colosseum (source: R. Lanciani, Forma Urbis Romae, table 29)*

Following that precious "archetypal map", some later updating activities have been promoted by University of Rome, until mid 1980's, and others have been undertaken by ex-Ministry for Education - Superintendence for Antiquities of Rome (then become the Special Superintendence for Colosseum, National Archaeological Museum and Archaelogical Heritage of Rome). Complessively, those activities have been extended from 1947 to 2005, through different, not ever continuous initiatives of archaeological mapping based on bibliographic notices and archive data, as available in different periods. Moreover, since 1995 this "maps mosaic" has been enriched also by preparatory works of a Commission in charge of the updating of Lanciani's "Forma Urbis Romae", promoted by the Council of Rome and its own Sovraintendenza Comunale office, in cooperation with the University of Rome "Sapienza".

On one hand, some results of these shared activities of data collecting, updating and checking, along with some early proofs of databases integration, flowed into the wider municipal informative system and linked with other cultural data on museums, art galleries, heritage items and territorial sites; on the other hand, many data acquisitions have been recently revised and collected into the "Atlante Storico di Roma Antica" (Carandini, 2012). Moreover, for modern historical periods some very valuable data banks have been implemented and also supplied of GIS components and web applications, such as the "Imago II Project" promoted by the Archivio di Stato di Roma, Council of Rome - Sovraintendenza Comunale office, University of Rome "Torvergata" (Micalizzi et al., 2011; http://www.cflr.beniculturali.it/), and those ones realized by CROMA, the Center for historical economic urban studies of University of Rome "Torvergata". In particular, those projects have dealt with digitization and georeferencing of some topic historical cartographic resources such as the "Carta di Roma" edited by G.B. Nolli (1748), the so-called Pio-Gregoriano cadastral maps ensemble, drawn during last decades of the roman Papato authority (Lelo and Travaglini, 2013), and all the other maps series derived from it (fig.7).
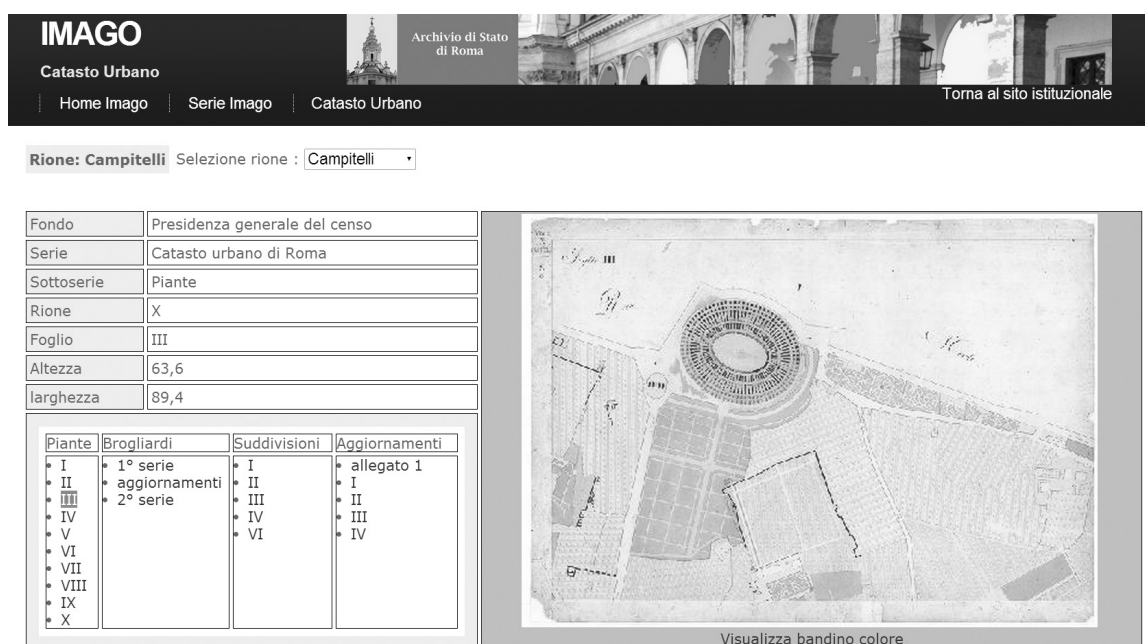

Figure 7: - *A screenshot from "Imago Project" web site: the cadastral map of Colosseum area, derived from "Pio-Gregoriano" cadastre of XIX century (source: Imago Project, http://www.cflr.beniculturali.it/)*

All together, these older maps and more recent archaeological mapping projects represent the scenario in which different cultural institutions have promoted their own latest initiatives, too often without a unified vision on epistemological issues and real needs of different communities of users, underpinning to archaeological knowledge mapping and managing. Unfortunately, this situation has brought to a clear lack of shared purposes and methodological/technological solutions, instead of promoting a single public point-of-access to archaeological field informations, resources libraries and data banks.

Since 2007, this scenario has been further enriched thanks to development and maintenance of the first digital archaeological cadastre for the metropolitan territory of Rome, undertaken through SITAR Project and specifically its AIS web platform. This effort has been motivated also by SSCol accountabilities and competences in terms of a rapid re-organization, fluid managing and correct multi-representation of Rome complex archaeological knowledge, that is being translated from field and archive data/documents into more accessible and useful metadata and digital objects, on behalf of many different SITAR users and through specific web collaborative instruments. In this direction, SITAR platform aims to offer an effective decision-support-system for territorial and urban planning and sustainable development processes, whenever it is necessary to cooperate between SSBAR and other public administrations and local government bodies for new action plans delivery.

6. Looking onwards for a common "AIS road-map"

In light of all these premises and theoretical reflections, also in view of next phases of our retrospective work, it seems possible to highlight some early open conclusions.

First of all, it may be pointed out the importance of more clear and shared purposes in development processes of ongoing public AIS platforms, as well as in creating the new ones. Among the other key features, following seem to be firstly put in evidence:

- it should be constantly guaranteed full access and sharing of methodological approaches to all the interested researchers and final user, in order to improve a virtuous circuit of participatory procedural and technological enhancements;

- all the promoting institutions should support concrete availability of archaeological data and knowledge through different suitable digital interfaces;

- these user interfaces should be better tailored on specific users requirements and with full respect of preservation of data and knowledge themselves;

- the knowledge platforms should have to be easily accesible for, explained and delivered to everybody, including obviously non-specialist publics, especially through well personalized accesses.

In conclusion, the new frontier of public AIS development seems to be an advanced and e-infrastructures-based "cultural meta-system" that should be seen as a constellation of renewed AIS, potentially named PArKS as an acronym for "Public Archaeology Knowledge System". For the evolution of such a digital cultural infrastructures will be necessary a clearer and shared awareness of common epistemological, methodological, cultural roots and social roles, even if in full respect of specific purposes of each experience and above all on behalf of Public Archaeology domain.

In this perspective, new and ongoing AIS development projects should have to take into account the current complex scenario, in order to be more deeply inspired by new Public Archaeology instances and compliant with critical societal challenges.

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