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'Designed' memory

La memoria 'progettata'

The paper proposes a morphological interpretation of a mediaeval site, chosen as emblem of the analytical survey and critique, in order to discuss its role in a cognitive / informative model. The possibility of sharing data, comparing interpretations and most of all of accessing and modifying models, makes knowledge functional to design phases, cultural heritage management and the safeguard of peoples' cultural "roots" when natural catastrophes and/or human intervention reduce ancient centers to rubble.
Up to date and in alignment with the current notion of systems' culture, the standardization obtained from the philological analysis of the recognized identities presents an opportunity to ponder the possibility of changing the principles on which the H-BIM families are based.
In the broader perspective of the debate on the nature and fundamentals of digital representation, the opportunity to contribute was seized.

Il documento propone un'interpretazione morfologica di un sito medievale, scelto come emblema dell'analisi e della critica analitica, per discutere il suo ruolo in un modello cognitivo / informativo. La possibilità di condividere dati, confrontando le interpretazioni e soprattutto di accedere e modificare i modelli, rende funzionale la conoscenza per progettare le fasi, la gestione del patrimonio culturale e la salvaguardia delle radici culturali dei popoli quando catastrofi naturali e / o interventi umani riducono i centri antichi macerie.
Al passo con i tempi e in linea con l'odierna nozione di cultura sistemica, la standardizzazione ottenuta dall'analisi filologica delle identità riconosciute rappresenta un'opportunità per riflettere sulla possibilità di cambiare i principi su cui si basano le famiglie H-BIM.
L'occasione è stata inoltre propizia per dare un contributo al dibattito sulla natura e sui fondamenti della rappresentazione digitale

Keywords: environmental and urban survey, multimedia information archives, informative/ cognitive model

***Parole chiave**: rilievo urbano e ambientale, archivi di informazioni multimediali, modello informativo/cognitivo*

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PREMISE

Intervention on pre-existing buildings, unlike newly constructed ones, poses numerous obstacles to the standardi-zation of components which is an absolute requirement for the digital management of data and models. Historic architecture is the result of the singularities that in the temporal succession of events determined the var-iation of its aspects very often over centuries. The survey, therefore is not exhausted in the self contained short cycle as for new buildings, but extends to the diachronic reconstruction of the changes that occurred, sometimes over multiple centuries, since its inception. In order to devise a system that may provide information but at the same time support the design, it is necessary to distinguish the diachronic phases, recognize and isolate the architectural elements into categories and associ-ate the categories with material and non material qualities. The latter play a leading role in this context in that the identity of a place is more closely defined by these less evident but more significant attributes. For these reasons, the geometric models that allow to visualize shapes in a plane or in virtual space prove to be inadequate. Mere descriptions are simply insufficient, what is required is a set of complete elements that can be organized accord-ing to clear and well defined objectives. In other words 'objects', in The BIM [Building information modeling] sense of the word, with unmistakable content and possibly "intelligent" [i.e. parametric] that allow for the man-agement of the configurative, structural and functional [1] properties [2], as well as the attributes i.e. the themes and traits that allow to retrieve values besides economic and material resources. [3] To date there are no procedures that guarantee an automatic semantic enrichment so the research is oriented towards the identification of a conceptual order, often juxtaposed with the 3D simulation, through which it is possible to manage the models and their metamorphoses within taxonomic logics : like Chinese boxes,cascade manipulations fall into specific areas, do not modify the typology of the whole and allow the sector specialist to intervene, with due caution, on multi and trans–disciplinary aspects [4] Amongst these, the critique survey analysis supporting urban composition is worth mentioning especially because of the interest it attracted and the impact it had during the 20th century. In this perspective it is important to note the emergence of the content which is needed for the ontological classification the only kind that enables to ac-cess categories which can be managed by informatics. [5] The site chosen to discuss these themes is one of the only three registered in Italy. The morphological analysis of this ancient area makes it still possible today to recognize from experience the identifying character of the origi-nal Norman city. [6]

FROM THE REPRESENTATION OF FORM TO THE MANAGEMENT OF CONTENTS

2D or 3D drawing representations express clearly and immediately the principles that identify the main outline of an urban event, they unveil why single communities chose to construct the built and derived space to interact with the surrounding environment. If the morphological survey is compared to the aerophotogrammetry and current as well as historical map extracts it allows to define themes to investigate in order to understand the trajectories that generated the modifications over time.
It is not a question of performing a typological analysis, as sometimes suggested, but rather of identifying identi-ties that can be compared which is impossible to carry out without representing content once the form has been surveyed. This is an necessary to organize the theoretical schemata first and then the tectonic-operative one. Thus the importance of using a discipline specific vocabulary cannot be over-emphasized: the alignment of the street fronts and the verification of the position of the planes in the projective space which conflict in the squares have a twofold operational significance. They measure the configurations of the squares, they yield iconic value which, with reference to the context, sig-nal key points from which to start analyzing design hypotheses aimed at the protection, enhancement or more importantly the restoration and requalification of ancient centers. [9] It is the colors, materials, and finishing details - such as portals, bollards, between-floor string courses, cor-nices, awning windows, and door knockers-that illustrate the spatial-environmental characters of a context and allow even the less attentive observer to recognize objects

Fig.1 Aversa, the foundation city and its historic extension. Identification of the monastic citadels near the studied area

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and circumstances from personal experience. [10] Taking into consideration the opinion of the inhabitants has proved to be a strategic necessity of the design choices for pre-existing artifacts in that only what is known is deemed worthy of protection and only to the extent of the value ascribed to it. [11] Thanks to emerging technologies, the above mentioned necessity has influenced the way stakeholders operate in the economics of reality. [12] Having overcome the gap that historically divided graphic representation and empirical realization, today repre-sentation can be experienced in different degrees of reality from the third person low level one (animation) to the immersive-inclusive high level one (augumented reality). The devices have been conceived so that the spectator, in turn user, can explore the space and then interact with a newly acquired awareness. Thanks a series of causes and effects collaboration spaces are created where reactions and opinions can be investigated and to this end vir-tual survey models. These are juxtaposed with both the diachronic reconstructions from the past and the future scenarios and thus give rise to complete and exhaustive documents based on the change in ways and methods applied to construc-tion. Though no substitute for reality, the retrieved characters, if handed down to future generations, will enable them to at least study and appreciate what was irrevocably lost due to natural catastrophes or human interven-tion. In this way “designed” memory will at least preserve the cultural “roots”.

SAINT BIAGIO SQUARE: THE ANALYSIS

Situated outside the Norman enclosure and within the Angevin one, Piazza San Biagio is in the center of the mediaeval city of “Avversa” (“adverse” in the meaning of against the Catholic pontifical sate of the time) and is a typi-cal example of spontaneous development that arose along the foundation path for functional reasons. It was lat-er transformed into a “designed” square on the model of the Roman style.
When the Benedictine nuns commissioned the construction of a new dormitory to Tommasiello Dell’Arco, qualified as architect in the 17th and 18th century documents, the transformation interventions brought about a redefinition of the monastic complex

Fig.2. Aversa, Piazza San Biagio View from above .

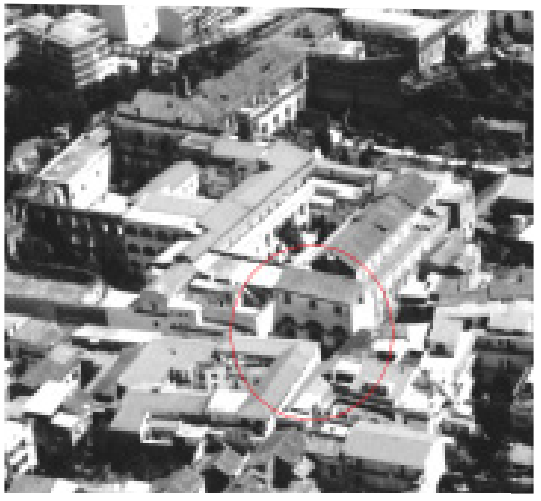

Fig.3. Opposite, road level quotas, extrusion of foundation paths

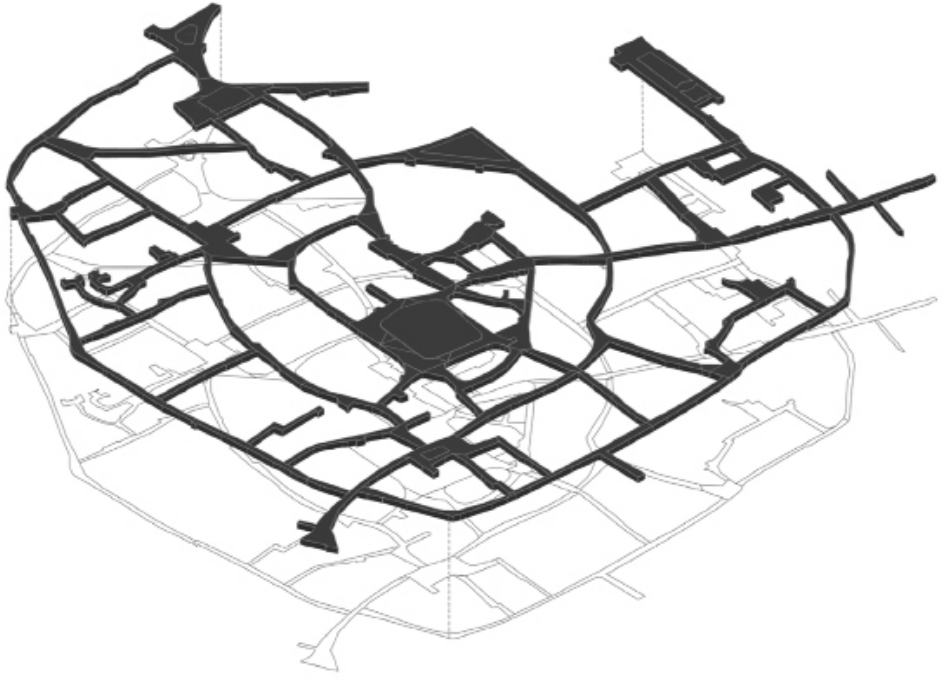

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Fig.4. Cadastre mapping of the areas: a) Identification of the urban paths and insulae

Fig. 4b Entrance to the city by Porta San Biagio ,early 19th century map extract

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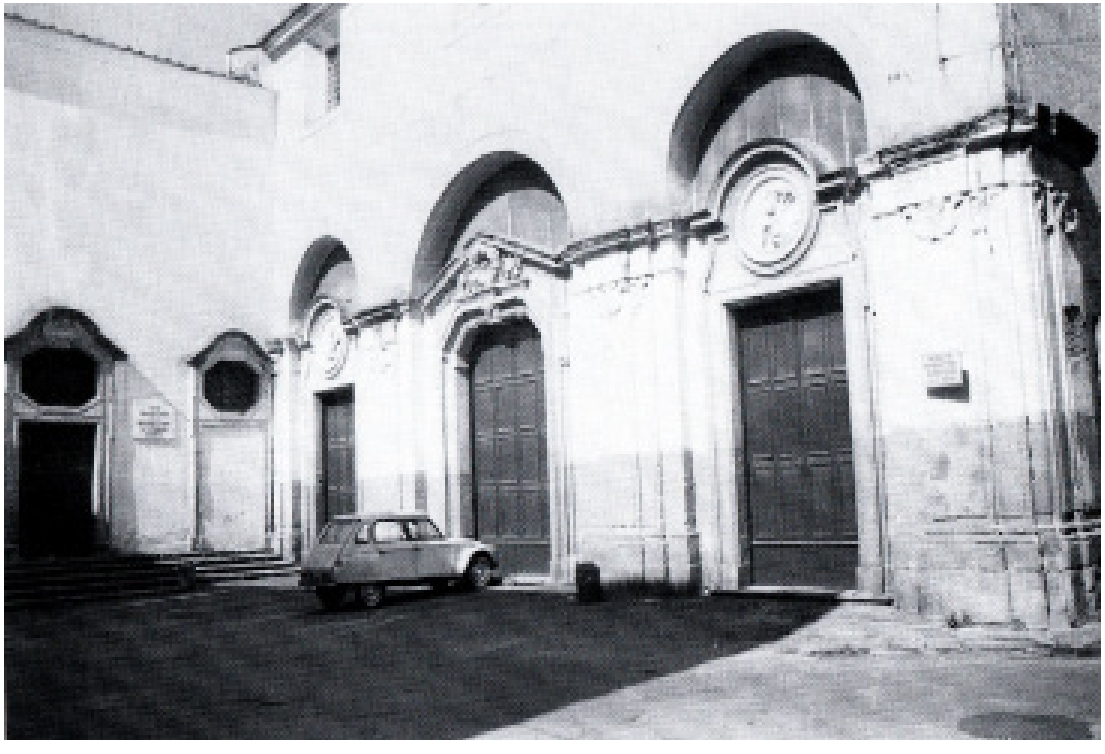

Fig.5 Views San Biagio from the foundation center to the homonymous gate) From the path to the entrance toward the modified corner;

which ended up with the inclusion in the monastic citadel of all the extant buildings.[17] In order to make the church accessible from the outside, the mediaeval wall, which followed the curved path, was squared,as can be seen from the cadastre documents [1875-1908]. The newly built corner, which was a "hinge" between the wall of the monastery and the church façade, transformed the area in a "designed" square. The double façade theme was chosen as the motif of the new intervention and was aimed at curtailing the randomness of the perspective effects. The design, which was realized in 1718, as attested to by the stone engraving on the façade, exploited the atrium as an element of optical seduction. the area in front of the church had been decorated so as to ensure "adequate entrance to the institution that characterized the urban node": those entering from Porta San Biagio wold gradually see the three portals granting access to the church and then upon reaching the center the arches sustaining the vaults that roofed the atrium which had been hidden since the original grates across the openings had been substituted with opaque glass [fig 2] By proceeding along the same directrix in the opposite direction the observer would see on the shorter side the entrances to the monastery [3] and then approaching further the above mentioned hinge corner identified by the orthogonal fronts. Palazzo del Tufo [fig 4] acted as counterpoint of the layout. It confirmed the mediaeval implant and embodied the socio- economic class of its inhabitants who were the owners of the surrounding agricultural estates. The architectural details, such as the portals and cornices attested to the dignity and lineage of the family The succession of focal points guided the observer's gaze beyond the center of the square to discover the subsequent sequence of reverse perspectives [19] The entrance and exit paths trace the "capital" line that links the heart of the city with one of the entrance gates. The directrix intercepts, in the geometric center of mass of the square, the axis of bilateral symmetry which was identified with the central access portal to the san Biagio church. The alignments obtained from the plan, based on the current layout of the external building perimeters clarify the optical strategies employed to encourage the visitor to station in predetermined points. The trapezoid shape of the base perimeter, almost regular after the 18th century interventions,

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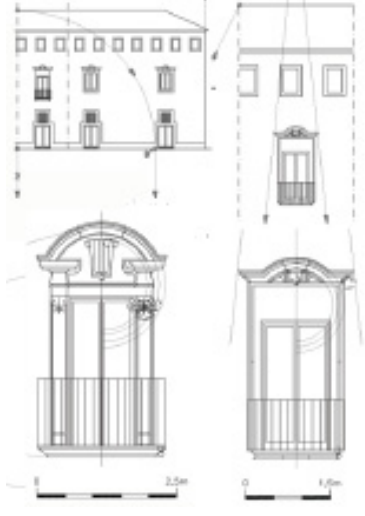
Fig.5c near the front of the building dominated by Palazzo Tufo

is figuratively completed in the vertex of a triangle which even if within the built area defines a space in which the geometrical asymmetry generates a controlled effect.
In order to define its perceptual effects, it is necessary to perform 3D modeling and use a video camera that can record the progressive close up zooms.
Due to the visibly accelerated perspective, the visitor entering the square from the city center, perceives the façade on the shorter side, as more distant and thus experiences a false perception of greater depth of the square.
By contrast, if the path and the direction of observation is inverted, the delayed perspective encourages the visitor to approach the church entrance.
So it seems that the visitors' perception is manipulated to favor certain stops in the observation itineraries.
In order to investigate the exchange between sensation and reflection it is necessary to probe the experience of each individual at a given time which is the only plausible truth [20].

THE SURVEY

The aim was to devise an information system, which, up to date with the times, was capable of progressively implementing survey or design models so that operators could constantly control the work and at the same time ensure that documentation would always be updated and readily available. A informative multimedia archive was configured ensuring that it would be accessible according to taxonomic procedures. Then it was organized into an integrated model that would result in a 3D container of immediately recognizable icons which could be juxtaposed with general and specific detailed [21] knowledge recalled using indexes and interactive links [22]. However, as usual, it is necessary to clarify the objectives: any global model, even the most methodologically founded one, except for numeric computation which can always be verified, is subject to interpretation and therefore can be challenged. The choice of instruments, methods and the scientific spirit of the time when the model is created contribute to its contextual objectivity.

Fig.6. Architectural details of the Tufo Stuff extracted from the information system



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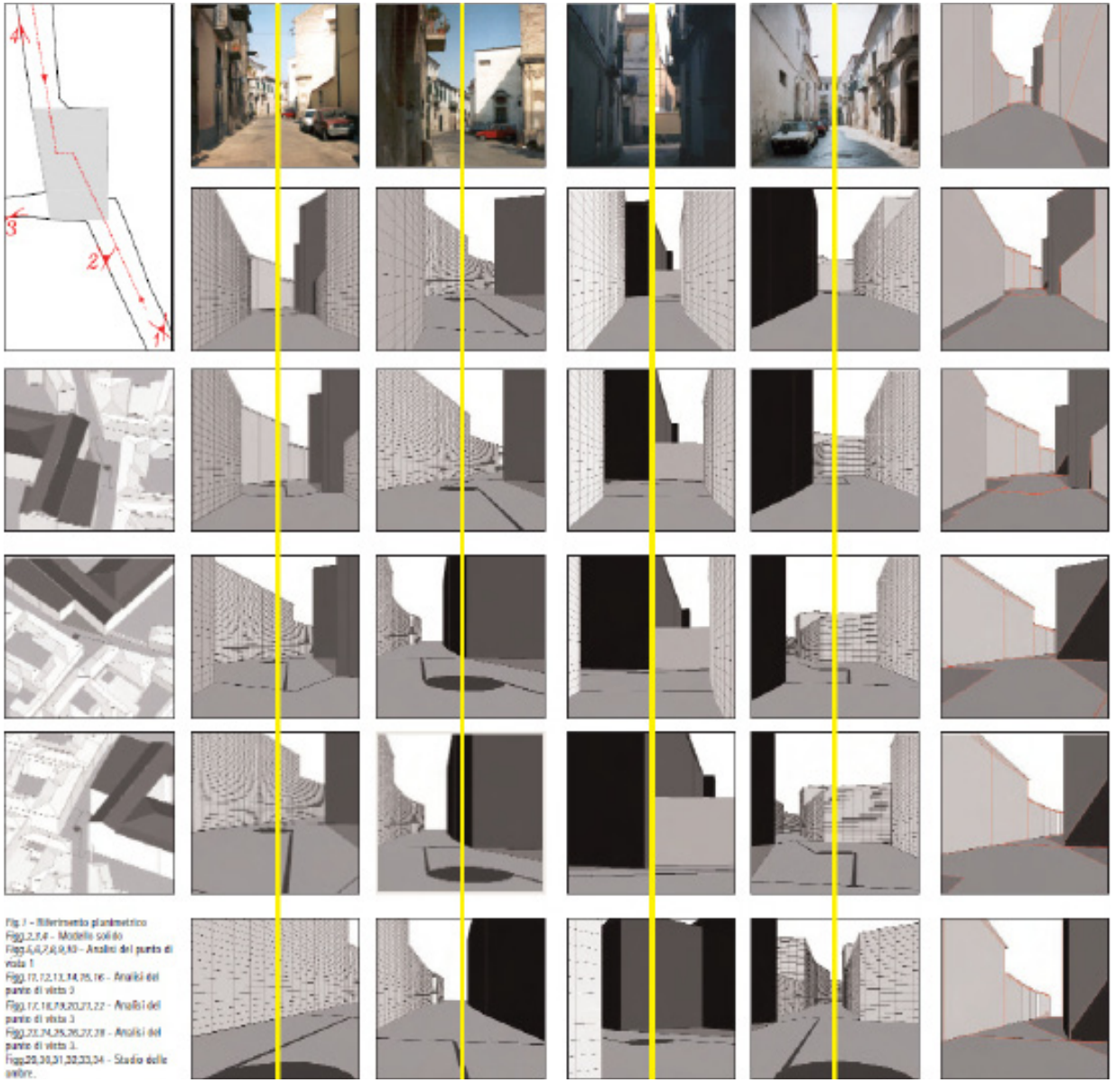
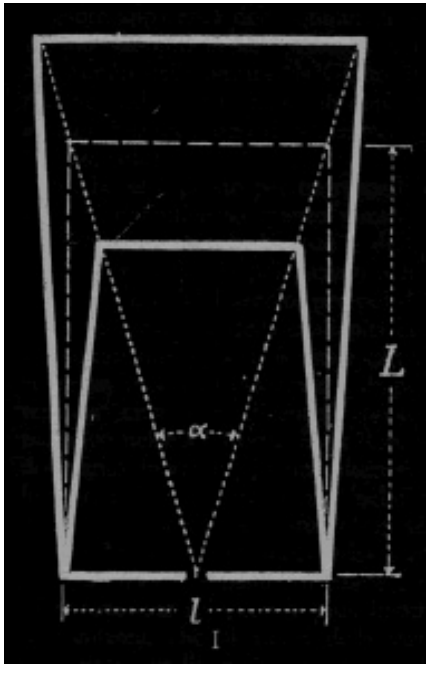


Fig.7a. Analysis of Views 1,2,3,4 in progressive progress

Fig.7b With reference to the vision cone the elements focused points in a trapezoidal space: study of the delayed and accelerated perspectives (by E.Guidoni 2005 Urban Trapezium spaces. History and interpretation of a design model, in XY n ° 11/12, p. 183)



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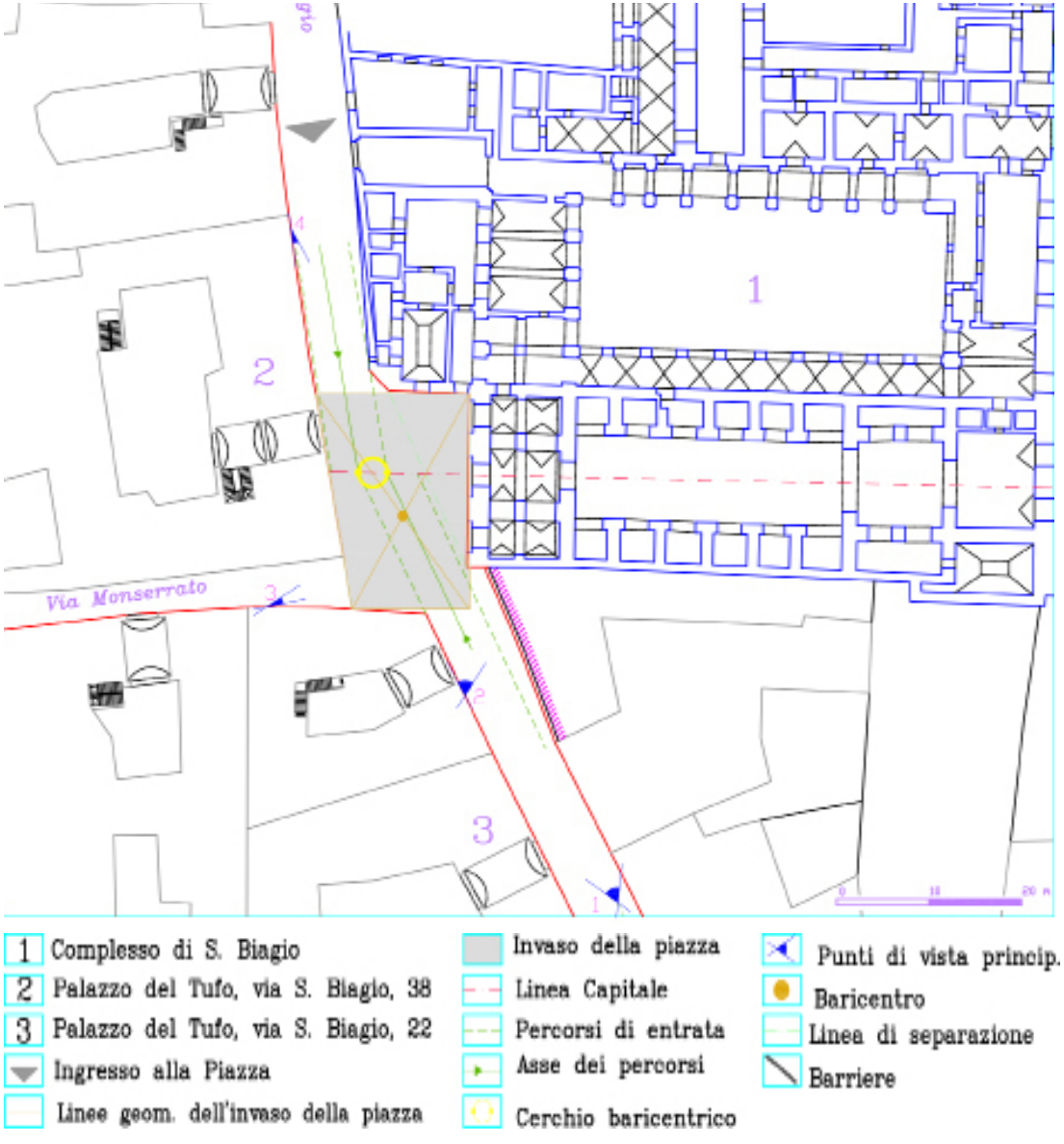

Fig.8a Application of the schemata to the refurbished square. Classification of the categories adopted for the analysis of Aversa's squares: a first attempt at organizing according to families, i.e. hierarchically organized categories distinguishable and editable thanks to the parametric approach to the identified attributes

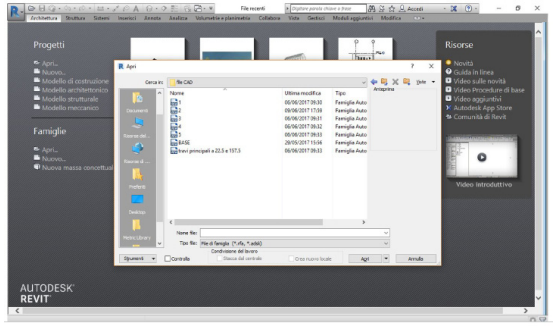

Fig.8b: Screenshot of Revit.
Families (or categories) are all the physical components of a set. If the set is the church of San Biagio its families would be the windows, the doors, the walls, the floor, the roof, the benches, the altar ... Each family can then be differentiated by typology, according to small formal differences which are editable thanks to parametric processing

The taxonomic logic informs the selection of an architectural element such as a window , for example , which becomes a more or less detailed "object" within a family or category then directs to selecting an architectural design, such as windows, which become more and less detailed "objects" within a family / category > window; Then> n. 4 b double lancet windows with pointed arches, n. 2 double lancet windows with rounded arches. The same cataloging logic could be extended to the descriptions of other attributes.

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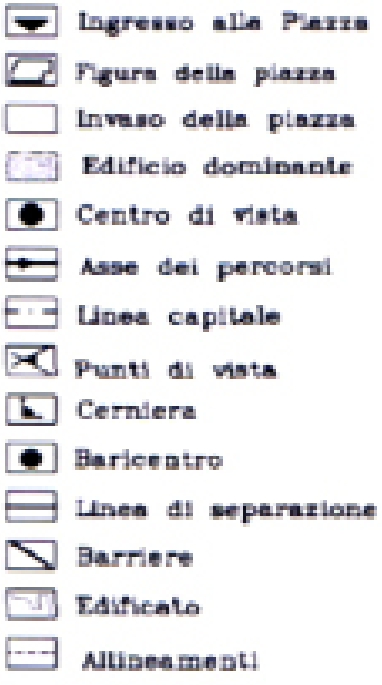
Legenda

Such were the definitions and symbols used to standardize the recognized identities in the squares of Aversa. They are but a first step in the creation of families /categories whose components are hierarchically organized by differences in attributes as well as identifying properties.

Appointment of recognized attributes and classifications necessary for the predisposition of manageable familiesi



Allineamento *- Def. di Guidoni: Disposizione sulla stessa linea: a) orizzontale, dei marcapiani orizzontale/ottico o dell'altezza degli edifici; b) ottico, di due o più elementi architettonici o di arredo lungo uno stesso asse - Def. adot.: idem.* ***Area della piazza*** *- Def. di Guidoni: Superficie (e sua estensione) dello spazio definito dalle funzioni proprie della piazza, che può ampliarsi agli spazi adiacenti (strade) o ad essa collegati - Def. adottata: Superficie definita dalle funzioni proprie della piazza; Motivazioni: nella ricerca in questione ci si è allontanati dal concetto di area dell'autore; si è preferito indicare con invaso la superficie in cui vengono svolte le funzioni proprie della piazza (viste, percezioni, stazionamento, attraversamento).* ***Asse - Assialità*** *- Def. di Guidoni: Retta mediana rispetto alla quale si verifica la simmetria di un edificio, di un sistema di edifici, di uno spazio, di una facciata - Def. adottata: Linea di separazione: linea che divide due parti non coeve, autonome e che delimita la configurazione della piazza precedentemente ad abbattimenti e a costruzioni posteriori; Motivazioni: nell'analisi formale dell'invaso della piazza si è preferito non considerare l'eventuale simmetria di uno o più edifici per ragioni legate prevalentemente ai contesti urbani in cui si è operato. Pertanto è sembrata opportuna la formulazione di una linea di separazione che indica le precedenti configurazioni.* ***Asse dei percorsi*** *- Def. Guidoni: definizione non considerata - Def.adottata: Asse dei percorsi di entrata; luogo preferenziale di attraversamento dei luoghi della piazza.* ***Barriere*** *- Def. Guidoni: definizione non considerata - Def. adottata: Costruzioni recenti che sacrificano la visuale completa di un monumento o di un insieme di manufatti; Motivazioni: l'esigenza della definizione di barriera nasce dalla natura degli spazi urbani analizzati: si tratta di piazze non monumentali (anche se caratterizzate da interessanti episodi architettonici) di un piccolo centro, sottoposti per molto tempo alla mano indifferente degli abusi edilizi.* ***Centro di vista*** *- Def. Guidoni: Luogo centrale di osservazione delle vedute principali e del panorama della piazza - Def. adottata: Punto di vista centrale: punto di stazionamento dove, ruotando di 360° su se stessi, è possibile cogliere tutti gli elementi principali della spazio della piazza: percorsi di entrata, monumenti dominanti, percorsi di uscita, cortine principali e secondarie.* ***Cerniera*** *- Def. Guidoni: Angolo rispetto al quale si dispongono, bilanciandosi a squadra o secondo altra angolazione, due edifici monumentali - Def. adottata: idem.* ***Dominante*** *(edificio): Def. Guidoni: definizione non considerata - Def. adottata: Edificio che per importanza e per dimensioni prevale sugli altri; elemento di riferimento di tutte le viste; Motivazioni: a differenza delle analisi di Guidoni si è preferito non ritenere l'edificio dominante l'elemento ordinatore delle simmetrie; ciò sempre in riferimento alla particolarità dei luoghi oggetto di studio.* ***Estensione della piazza*** *- Def. Guidoni: Prolungamento della qualità e delle funzioni della piazza al di fuori dei suoi limiti spaziali - Def. adottata: idem.* ***Figura della piazza*** *- Def. Guidoni: Forma planimetrica definita ed interpretabile come immagine geometrica o simbolica fondamentale della piazza (triangolo, trapezio, quadrato...) - Def. adottata: idem.* ***Ingresso alla piazza*** *- Def. Guidoni: Accesso obbligato, preferenziale o d'onore alla piazza; luogo della veduta privilegiata o più completa - Def. adottata: Accesso privilegiato alla piazza -* ***Linea capitale*** *- Def. Guidoni: Linea passante per il centro della piazza e dell'edificio dominante, costituente asse progettuale e di simmetria principale - Def. adottata: idem.* ***Linea di quadro*** *- Linea di intersezione del quadro prospettico col terreno, tangente gli spigoli degli edifici principali, al di là della quale sono riuniti tutti i soggetti della veduta - Def. adottata: Linea che indica l'intersezione con il terreno del quadro prospettico; tale quadro deve risultare tangente agli spigoli degli edifici dominanti e al di là di esso devono essere riuniti tutti i soggetti delle viste principali.* ***Percettibilità*** *- Def. Guidoni: Possibilità di discernimento dell'articolazione spaziale e dei dettagli architettonici e decorativi in rapporto alla distanza dell'osservatore e alle condizioni di visibilità e di illuminazione - Def. adottata: idem.* ***Percorsi di entrata*** *- Def. Guidoni: definizione non considerata - Def. adottata: Percorsi principali di entrata e/o di attraversamento dell'area della piazza.* ***Perno*** *- Def. Guidoni: Elemento verticale fondamentale, centrale o periferico, equilibratore delle vedute e unificatore dello spazio (colonna, guglia, campanile) - Def. adottata: idem.* ***Platea*** *- Def. Guidoni: L'area libera e multiuso della piazza esterna ad un'area rialzata, recintata (sagrato) o che comunque può definirsi palcoscenico - Def. adottata: idem.* ***Punto di vista*** *- Luogo di stazione privilegiata (per l'osservatore) delle principali vedute della piazza o di particolari effetti prospettici - Def. adottata: idem.* ***Vista assiale/di spigolo/diagonale*** *- Def. Guidoni: Quadro ottico parziale, principale o secondario, orientato verso un fondale, lo spigolo di un edificio monumentale o un angolo di cerniera - Def. adottata: Vista particolare orientata non direttamente verso la facciata dell'edificio dominante bensì verso uno spigolo, un angolo o una cerniera*

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THE ADOPTED METHOD

During a direct survey campaign, carried out also for didactic purposes, the information needed to assemble an integrated archive was collected. Two techniques were employed to gather the data. One entailed carrying out the survey using passive sensors (photographs) which could be remotely inspected in immersive mode. The other was essentially a sample verification to compare the photo models in scale with laser scanner mapped vector objects (active sensors) [26]. Some support deices allow for the parallel operation in two 3D digital environments. in one it is possible to scrutinize the panoramic immersive photographs and in the other it is possible to reconstruct the 3D model using stereo couples. Both procedures are based on the possibility of using a computer to put together, mosaic like, sets of photos taken with a digital camera. As it is not necessary to have perfect perpendicularity of the optic axis with respect to the shooting plane, the single photos are elaborated using image matching algorithms to identify corresponding elements in portions of adjacent and partially juxtaposed photographs. The devised descriptors automatically assess the parameters necessary to orient in space every single shot, correct characteristics to fuse the best parts and then with respect to these they calculate the nodal point of the device (which is like the main point in photographic optics). If the sets of photographs cover a visual field of 360° on the horizontal axis and 180° on the vertical axis, the system allows the observer to be catapulted into a "bubble" whose radii correspond to the distance from the device's nodal point and the respective shooting planes. Using an ordinary inexpensive stereoscope the sensations will be very similar to real life ones. The zoom function allows to obtain close ups without losing measurable details (gigapixel) 3D geometries which were accurately photorealistic and measureable with mathematical certainty, were also obtained using sets of photos. The projection criteria which link the physical 3D reality to the 2d images were very similar for both products. And in both cases the stitching software recognized amongst the captured and juxtaposed pixels anchoring elements and homologous points of the equivalent computable system. The computation processes are totally different as are the elements to plan for in the shooting phase. Normally the applications used to generate photomodels (SfM) Structure from motion) Were conceived to obtain data from stereoscopic vision even if the most recent research in the field is actively investigating how to limit the differences and eliminate the distances. Photo realistic 3D models make a great quantity of information available such as dimensional metric data, the state of conservation of the artistic and historic built environment and the relevant documentation. If necessary they can be transformed into boxes for the creation of collaboration spaces. Satisfying consumers' desires has proved to be a duty for society and its institutions. Contemporary users are not satisfied by merely viewing a project but expect their needs to be addressed. Therefore, the services offered in cyberspace call for the cooperation of institutions, the creative industry and the search engines. In this perspective range based, image based and other advanced techniques have oriented the informatics digitalization of the existing heritage. The development of a simultaneous and mostly iconic culture has impacted the way heritage is catalogued, divulged, studied, and managed. These observations stimulated the construction of a multi- media product set in a rigorously scientific context (in the experimental sense) in the quest for a methodology that could be applied to similar cases. The study also provided the opportunity to contribute to the debate on the nature

CONCLUSIONS

The history of urban spaces modeled according to a design plan that is expressed in the construction of outstanding architectural elements was a major topic of research in the field during the 20th century. Its impact is still traceable form both a theoretical and operational point of view. Theoretically the studies set the contextualization of urban and architectural phenomena in a new perspective and operationally they made it possible to conceive a classification system for significant attributes perfectly aligned with the current notion of systems culture. The above mentioned techniques offer support to the organization of logics that allow for "intelligent" management of data banks, material properties and also attributes of the artefatcs. However, at present, there are two main factors that make it difficult to exploit these possibilities to their full potential. On the one hand there is a lack of programming based on experimental knowledge and practice, on the other search engines need to improve accessibility especially in terms of data modification and reuse.

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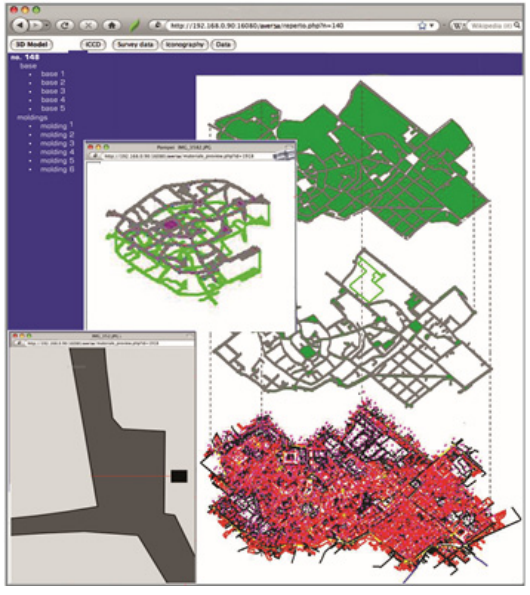

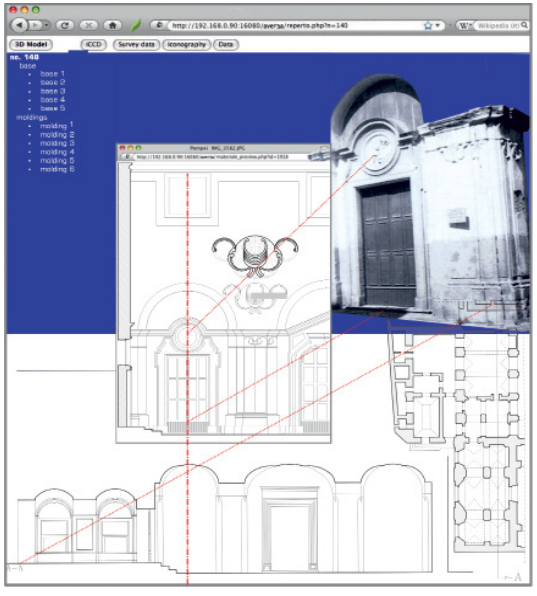

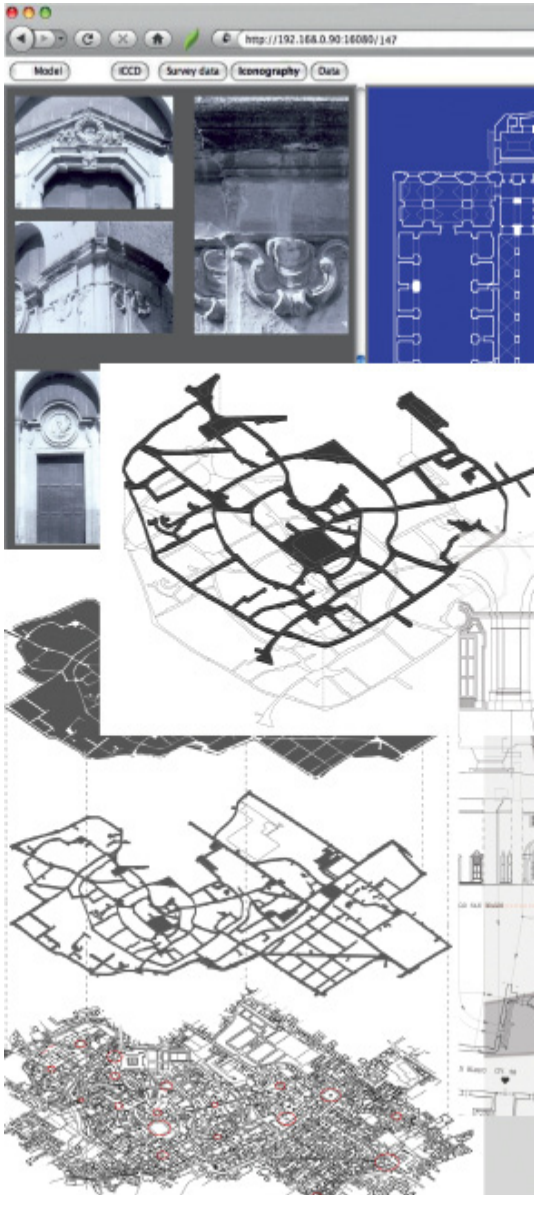

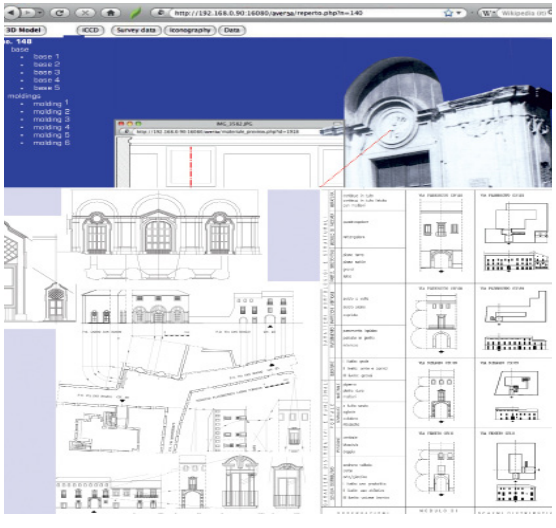

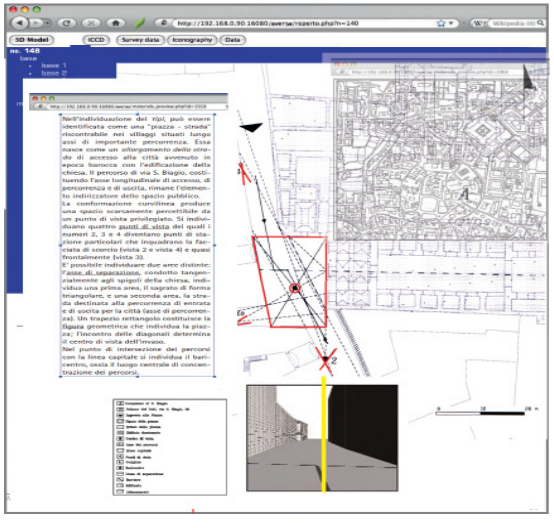

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NOTE

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[24] Penta 2000.

[25] Garagnani, 2010 [16] Guidoni, 2002

[26] Parrinello, Picchio, 2013:1-14

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NB. Il rilievo diretto è stato eseguito dagli allievi della prof. R.Penta, Facoltà di Architettura SUN a. accademici 1992-1995, tutor arch. A.Rossi per la rappresentazione urbana e architettonica, arch. A. Cirafici per la rappresentazione delle insulae conventuali.
La modellazione tridimensionale del centro di fondazione è stato elaborato dagli allievi (Colombiano N. e De Luise M.) del corso di Disegno, Facoltà di Ingegneria, prof. A. Rossi, a. a. 2009-2010. Gli allievi degli anni successivi hanno lavorato alla classificazione tipologica dei manufatti. Nelle definizioni presentate le elaborazioni grafiche sono state curate dall'arch. F. S. Golia, assegnataria nel 2002 di un contratto di ricerca L.42 Reg. Campania dal titolo "I segni distintivi dell'abitare".

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