Informative modelling
towards 2D / 3D visualisation of architectural evolutions

J.Y Blaise, I.Dudek

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What a mess !..

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towards 2D / 3D visualisation of architectural evolutions

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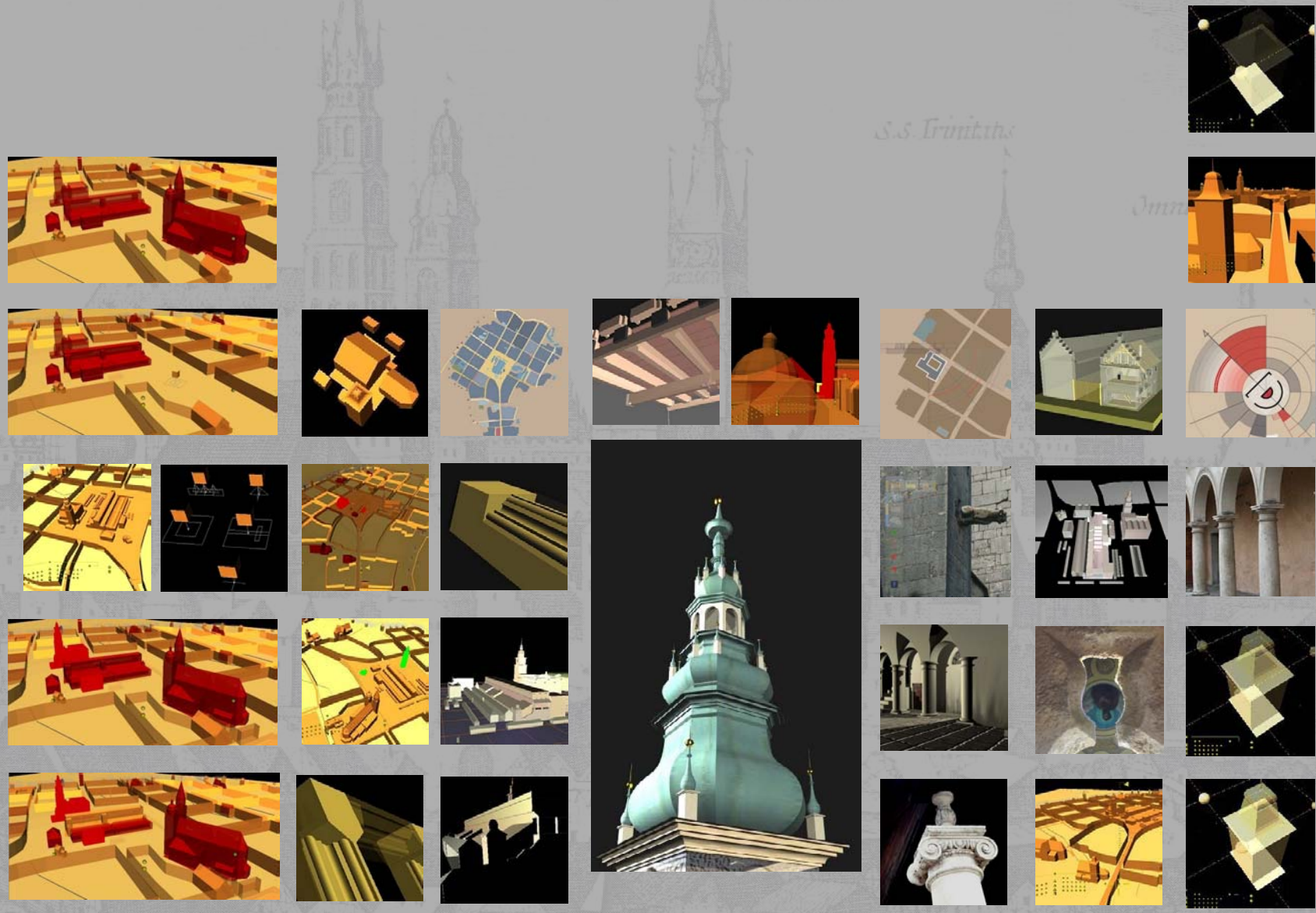

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Applications of computer science to the field of architecture

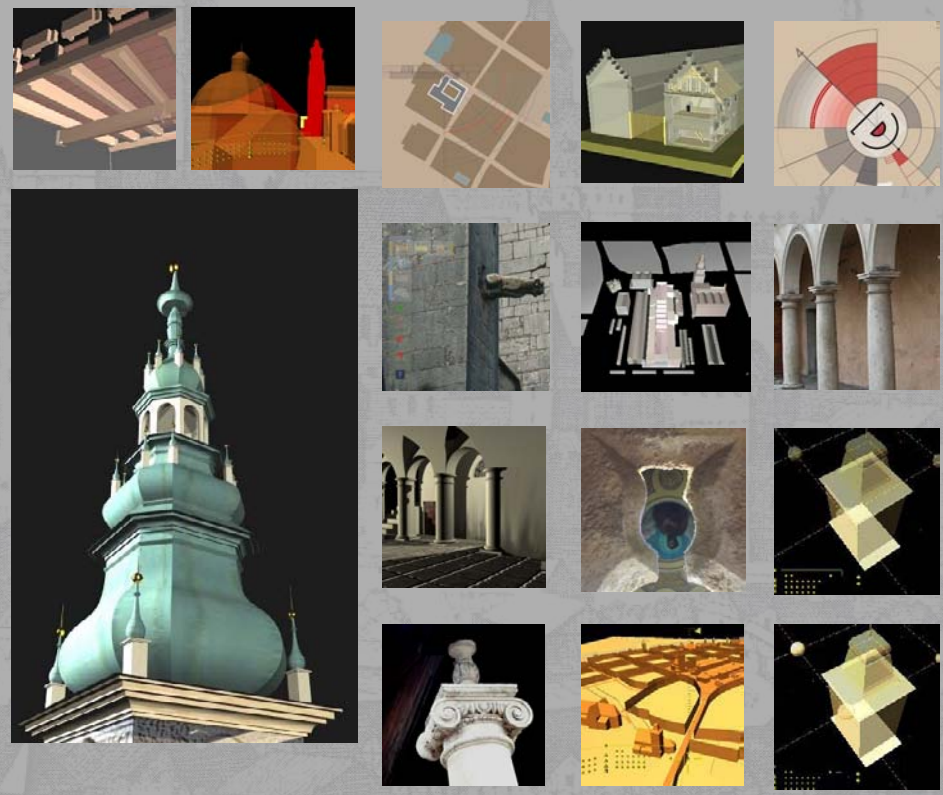
Multidisciplinary research actions

One research unit, 5 locations

In Marseilles, a focus on:

- **Surveying techniques**
- **Architectural modelling**
- **Information Systems for the heritage**

<*www.map.archi.fr*>



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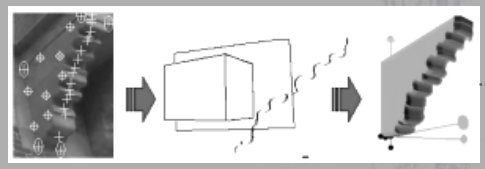
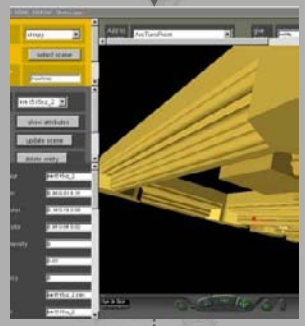
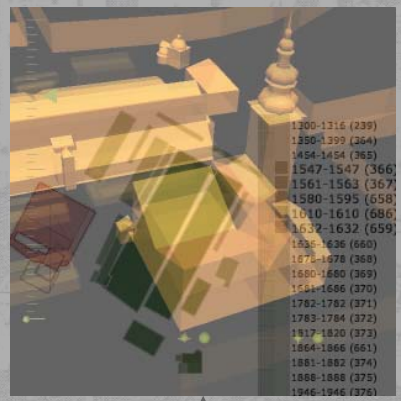




- From surveying techniques to architectural modelling

- From the model to the data: using 3D models as a navigation tool



- Using models not only to navigate inside date sets, but also to visualise data sets.

- Circumscribe a global approach to the management and visualisation of heritage data: *informative modelling*

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(*Centre National de la Recherche Scientifique
Komitet Badań Naukowych)

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Département SHS)

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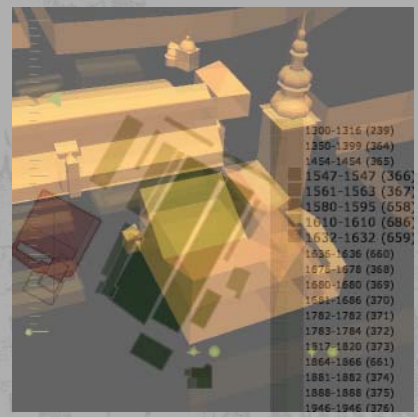
Informative modelling
towards 2D / 3D visualisation of architectural evolutions

From artefact modelling



to information visualisation
(using the artefact 's morphology)

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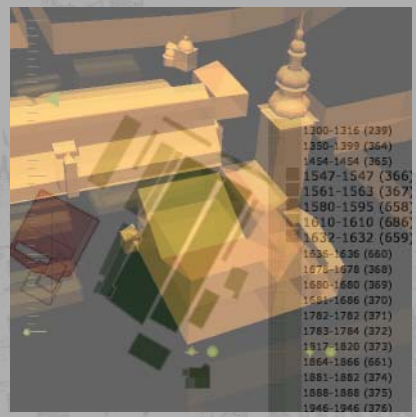
From representing an artefact
[geometric information]



to representing what we know of an artefact

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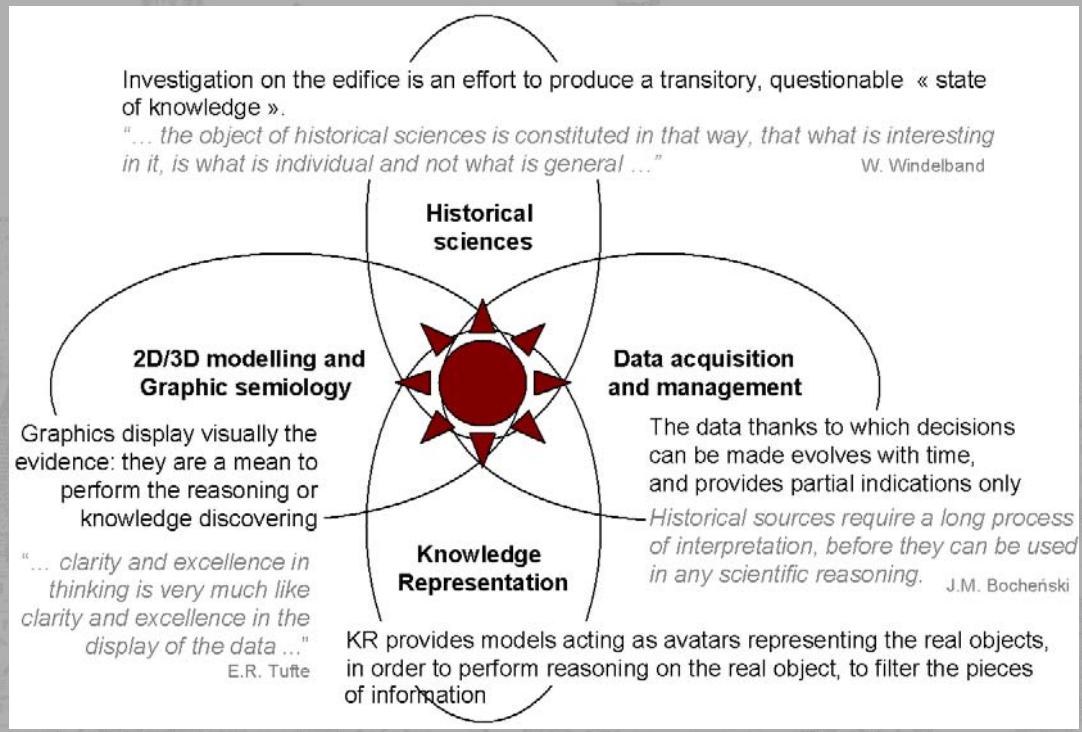

An intersection of disciplines & practices

A focus will be put during this presentation on the role of visual displays

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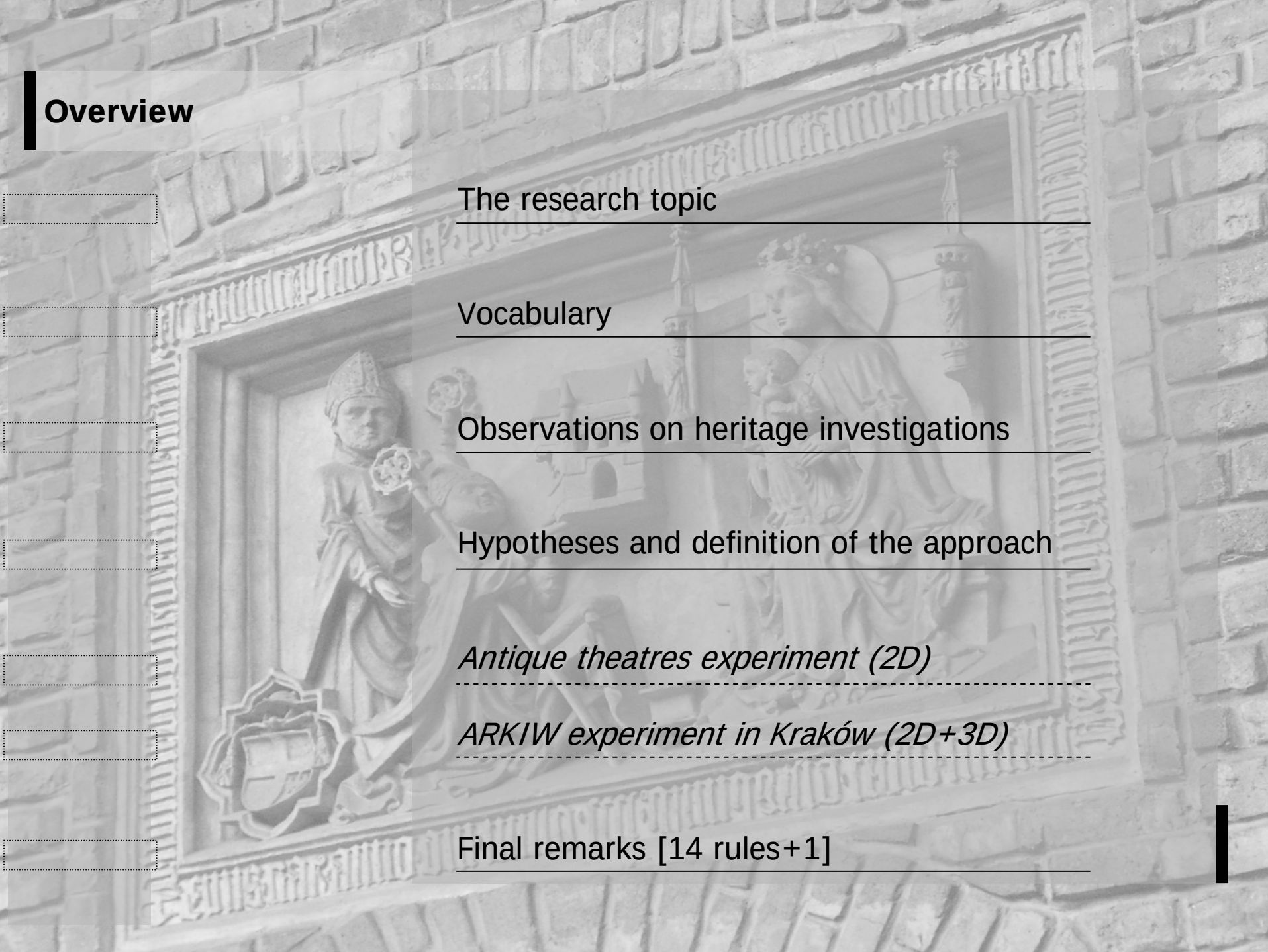

Overview


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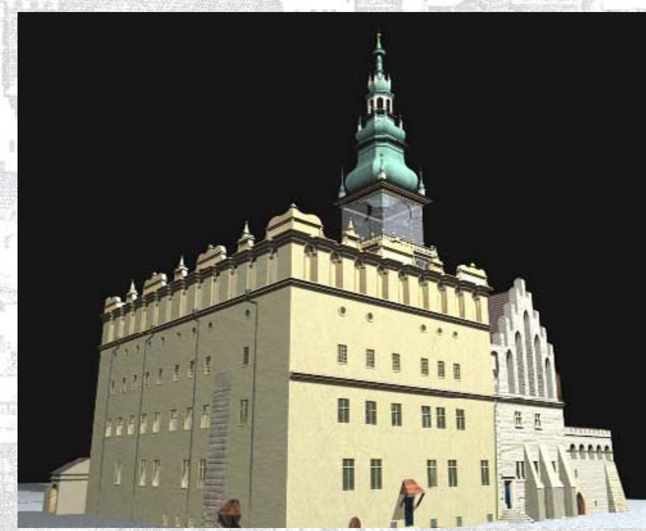
START!..

The research topic

Basing on available observations and knowledge about an artefact, how can we better understand and represent its evolution with (or in spite of) new technologies?

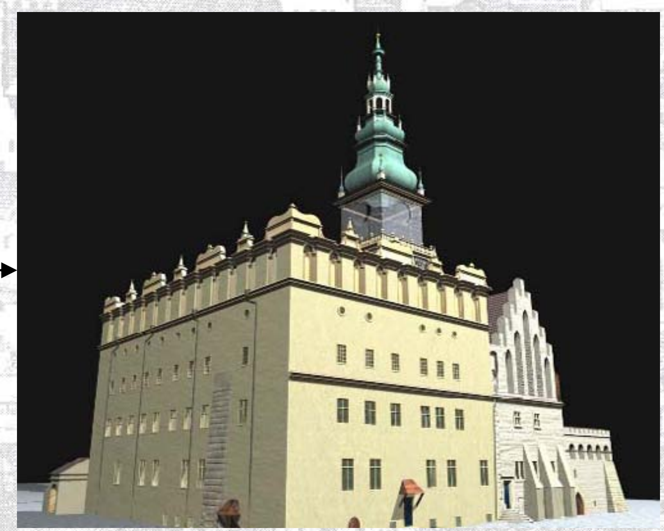


The research topic

Basing on available observations and knowledge about an artefact, how can we better understand and represent its evolution with (or in spite of) new technologies?

- A concern for the analysis, management and visualisation of **data** [eventually information] about the artefact,

-A concern for the analysis and representation of the artefact's **morphology**



Discrete temporal items
Discrete spatial items

The research topic

http://www.vegas.com

http://www.abcparislive.com/

Basing on available observations and knowledge about an artefact, how can we better understand and represent its evolution with (or in spite of) new technologies?

Synchronic* approach : these two objects are comparable.

Diachronic* approach: these two objects differ; they are, at best, related to one another through a "sort-of" relation

The morphology of the artefact, its physical shapes, become meaningful because of the information we derive from them, and this information is more than a technical nomenclature

What we strive to understand is, beyond the artefact itself, what the artefact tells us about a time, a place, and a knowledge area

**** a reference to Ferdinand de Saussure***

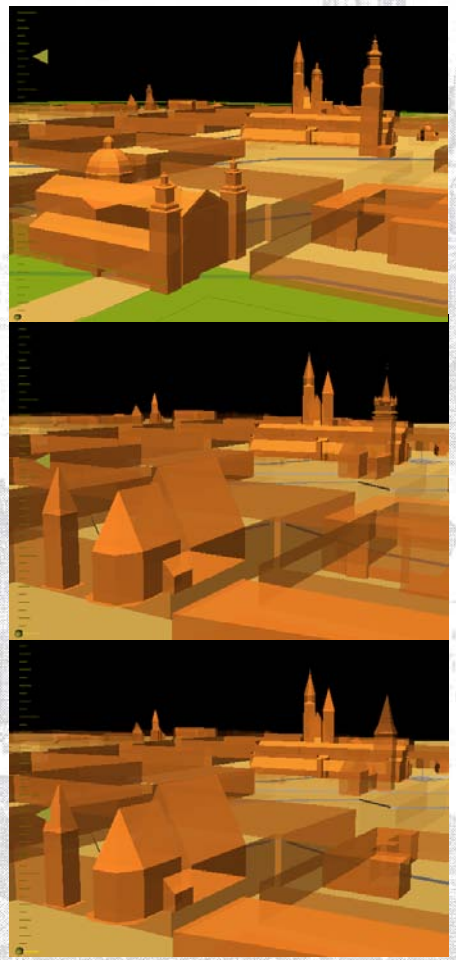
synchronic: deals with a language e a given period, identifies its rules and norms

diachronic: deals with a language 's evolution

The research topic

Our objective : build abstract representation of artefacts that have existed or still exist in order to :

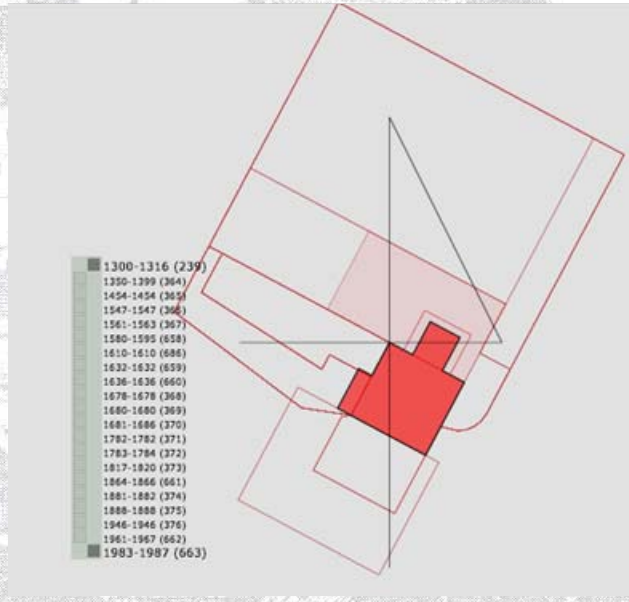
- understand and recount the evolution of the artefact, in 2D or 3D



1850

1500

1425

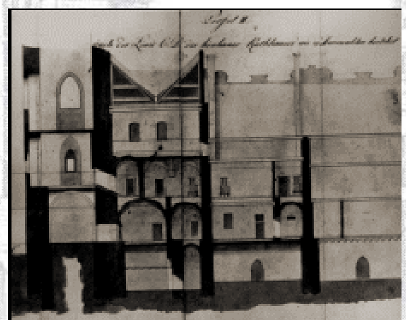


The research topic

Our objective : build abstract representation of artefacts that have existed or still exist in order to :

- understand and recount the evolution of the artefact, in 2D or 3D

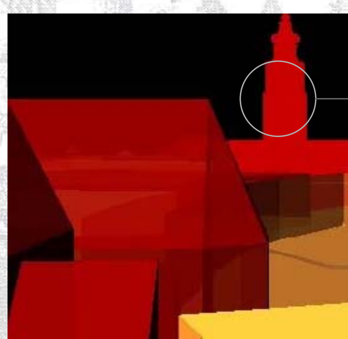
- Structure and and give access to the pieces of data and information that helped studying the above mentioned evolution

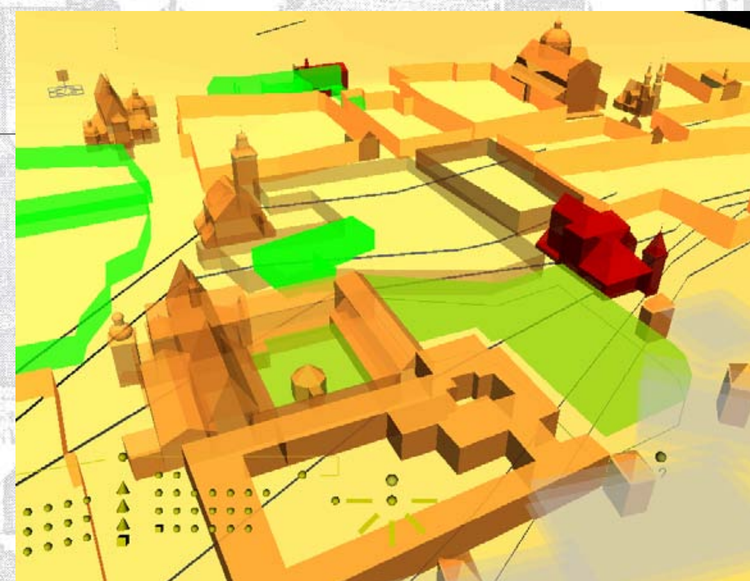


The research topic

Our objective : build models and representations of artefacts that have existed or still exist in order to :

- understand and recount the evolution of the artefact, in 2D or 3D
- Structure and and give access to the pieces of data and information that helped studying the above mentioned evolution
- «Visualise » this information , and therefore underline its lacks.





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The research topic

Our objective : build ***models*** *and* ***representations*** *of artefacts that have existed or still exist in order to :*

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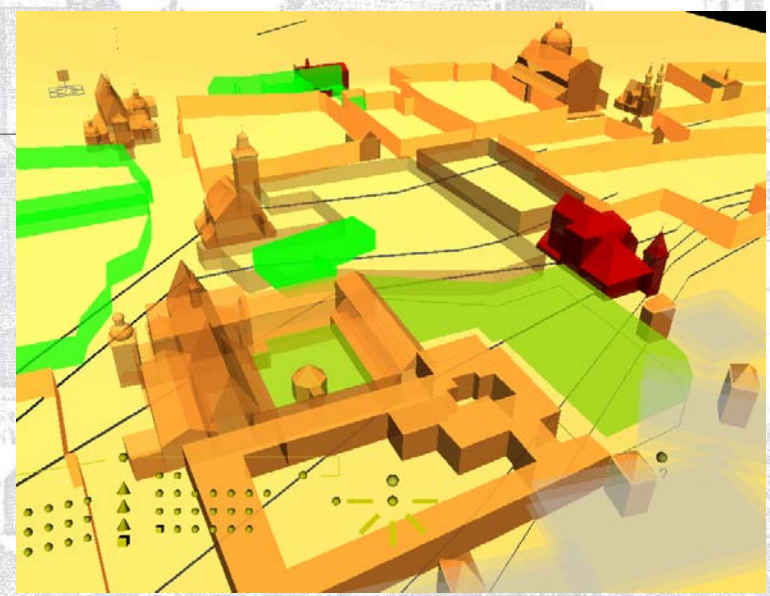


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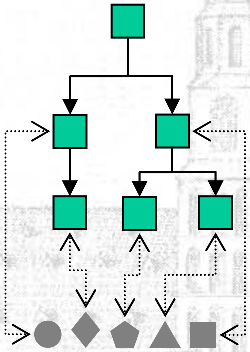
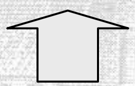
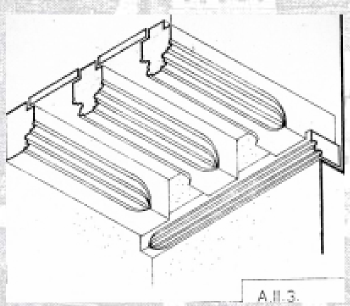
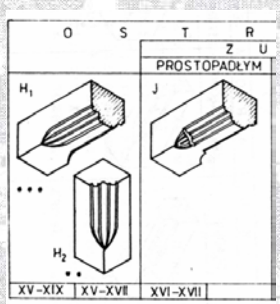
Vocabulary

models *of artefacts*







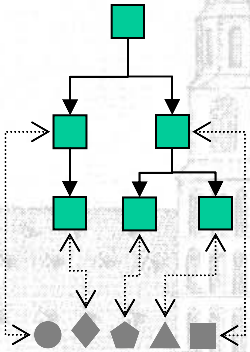


The model is a structure used in order to describe and solve real-world problems prior to the study itself[1]

[1]S.Francis, The importance of being abstract actes Conf. Turing to 2000 Ecaade 1999

Vocabulary

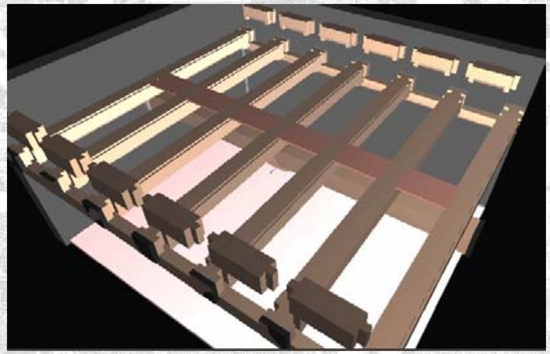
models *of artefacts*



The model is a structure used in order to describe and solve real-world problems prior to the study itself

Modèle [FR]
Theoretical model [EN]

Maquette [FR]
3D/2D model [EN]



[1]S.Francis, The importance of being abstract actes Conf. Turing to 2000 Ecaade 1999

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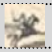
Vocabulary

representations *of artefacts*



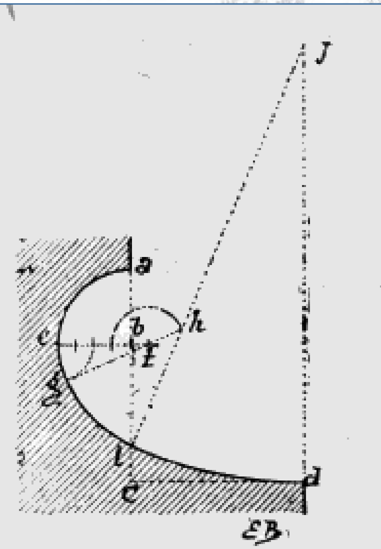


Fig. 666.

Graphic representation is part of the systems of signs that man created in order to *retain*, *understand* and *communicate* the observations to him necessary[1] (...)

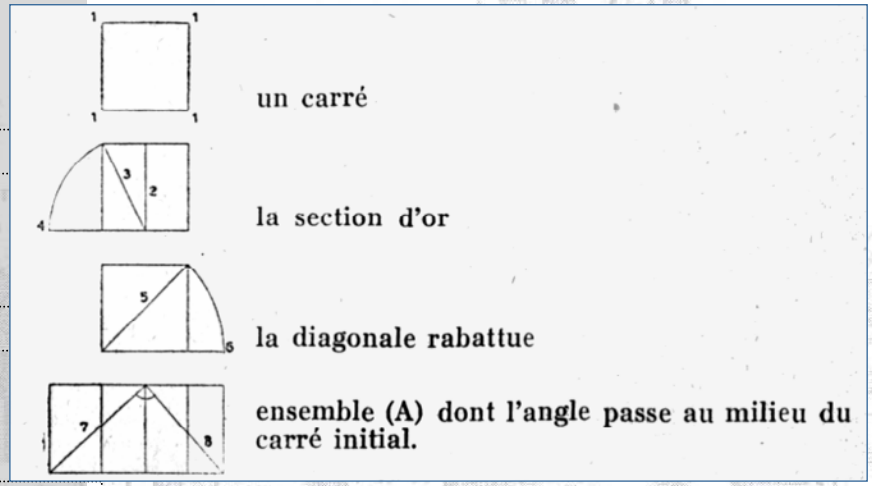
Preserve...

E.Barberot, Aide Mémoire de l'architecte et du constructeur, Librairie polytechnique C.Béranger (1914)

[1]J.Bertin, Sémiologie graphique, EHESS (1967) 1998.

Vocabulary

representations *of artefacts*



Graphic representation is part of the systems of signs that man created in order to *retain*, *understand* and *communicate* the observations to him necessary[1] (…)

Understanding is reducing overwhelming data to the limited number of information that we are likely to take into account in relation with a given problem[2].

Le Corbusier. Le Modulor, Editions de l'Architecture d'aujourd'hui, collection Ascoral, 1958

[2]J.Bertin, Sémiologie graphique, EHESS (1967) 1998.

Vocabulary

representations *of artefacts*

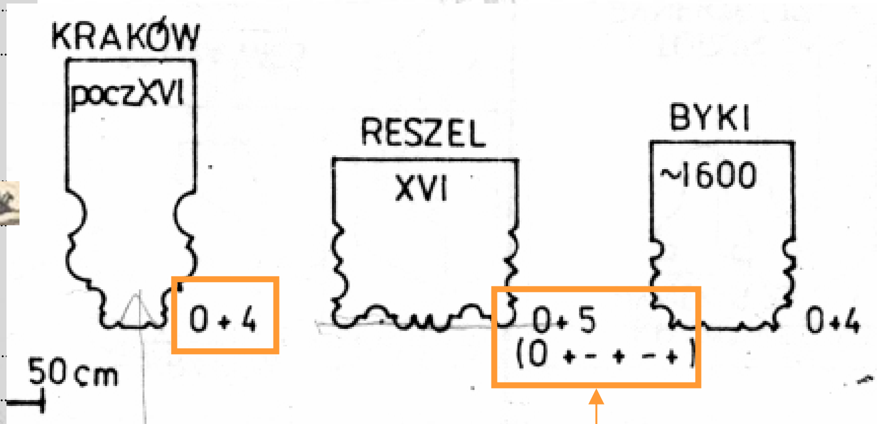
Graphic representation is part of the systems of signs that man created in order to *retain*, *understand* and *communicate* the observations to him necessary[1] (…)

Tell others without information loss

[2]J.Bertin, Sémiologie graphique, EHESS (1967) 1998.

Vocabulary

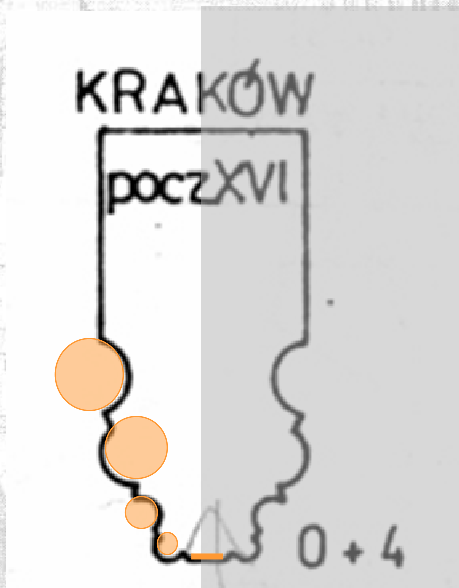
***Visualise** the information*

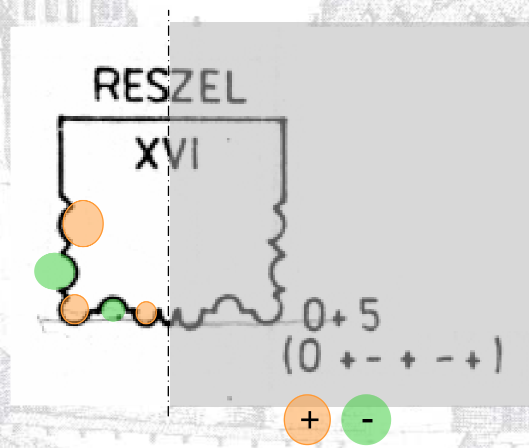


Visualisation is a cognitive activity[1].(…)

[it produces] a gain of insight and understanding[1](..)

Its result is a mental image[1] (..)





Jan Tajchman Stropy drewniane w polsce. Propozyca systematykiOśrodek dokumentacji zabytków, Warszawa 1989.

[1]Robert Spence, Information visualisation Editions ACM Press / Addison-Wesley.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On the specificity of heritage investigations

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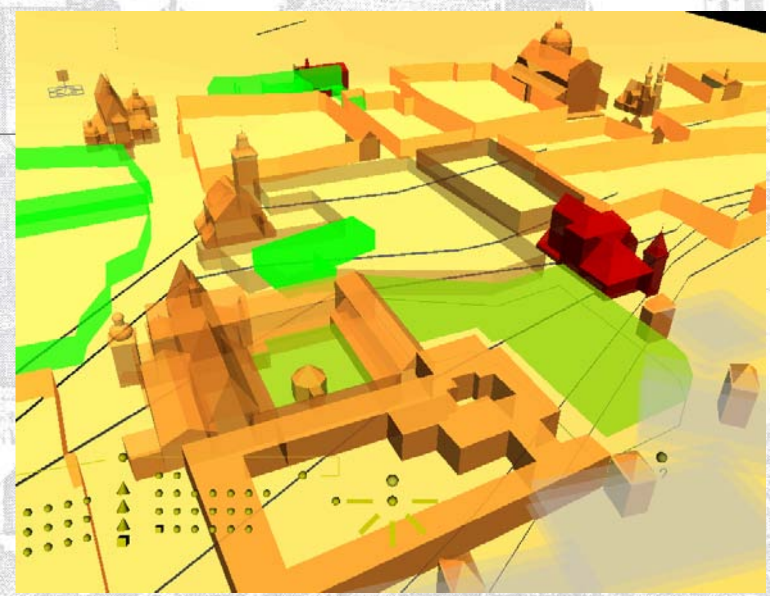

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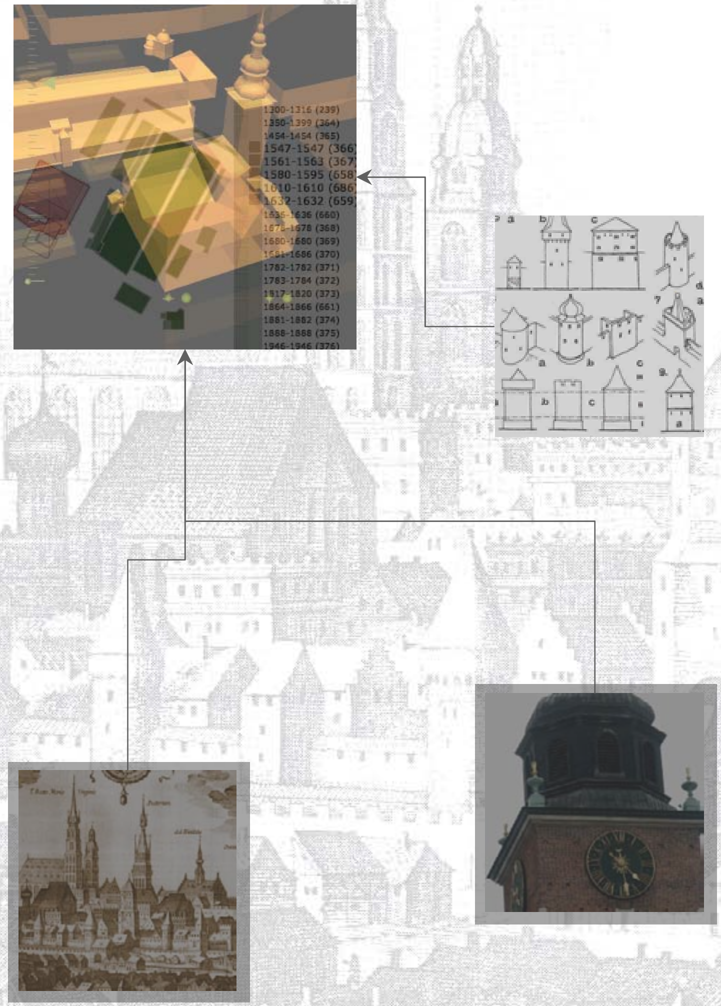
On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?



- Generic pieces of knowledge

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On the specificity of heritage investigations

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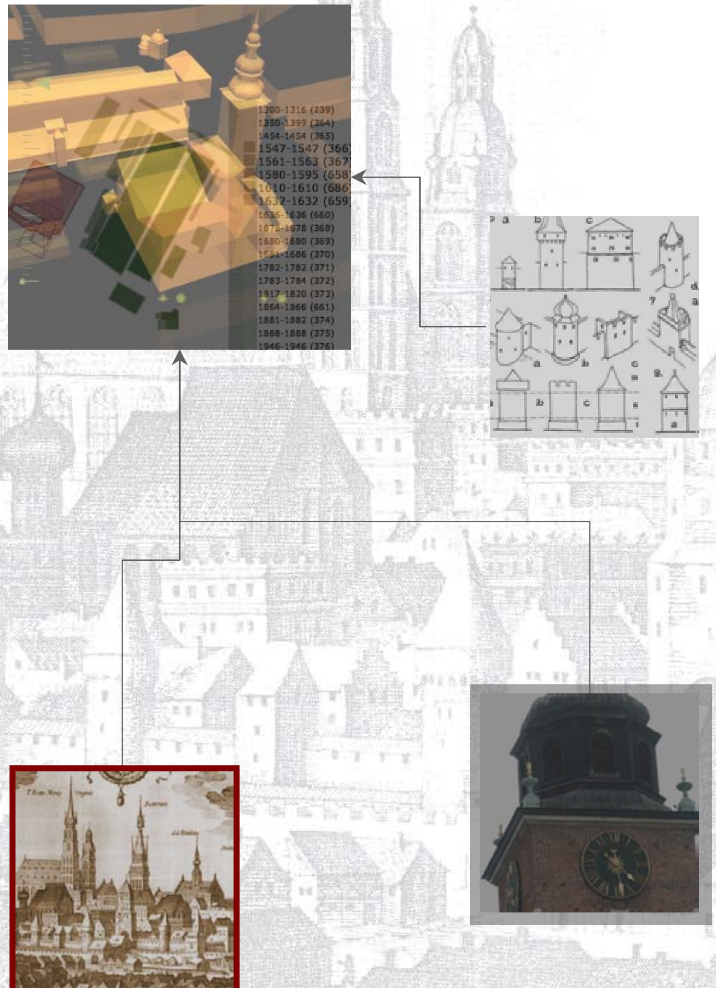
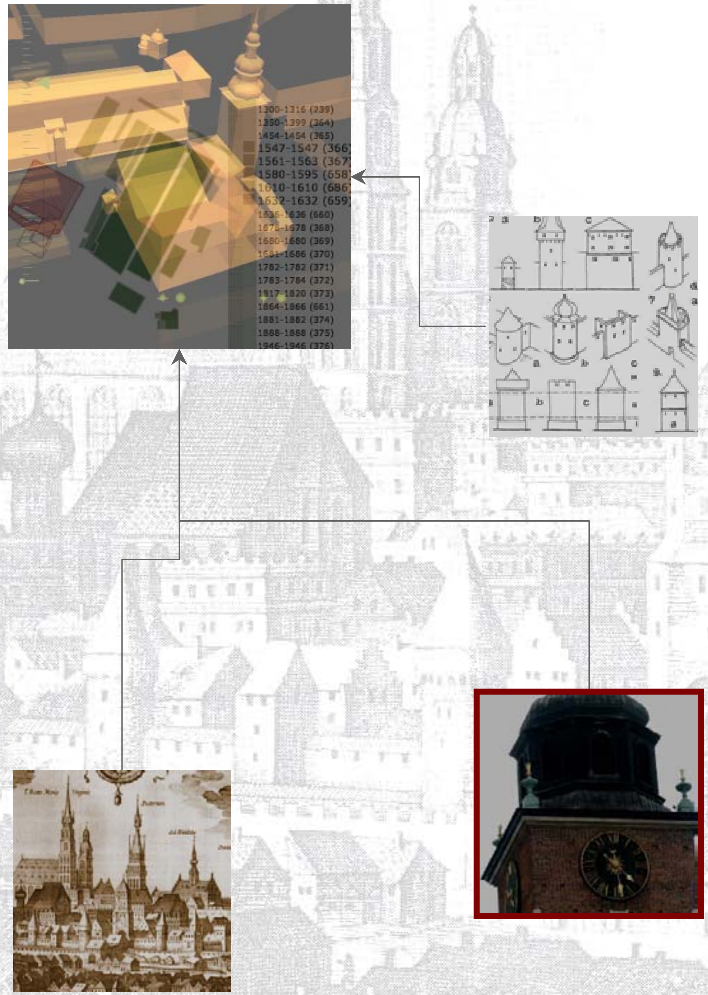


- Generic pieces of knowledge
- Specific sets of information (provided by documentary sources)

On the specificity of heritage investigations

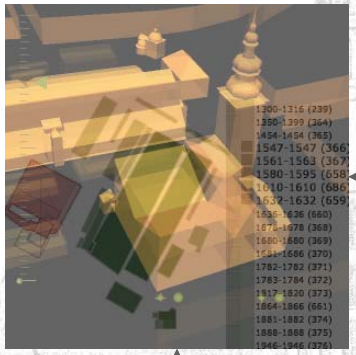
From what sources can we build such models and representations of artefacts ?

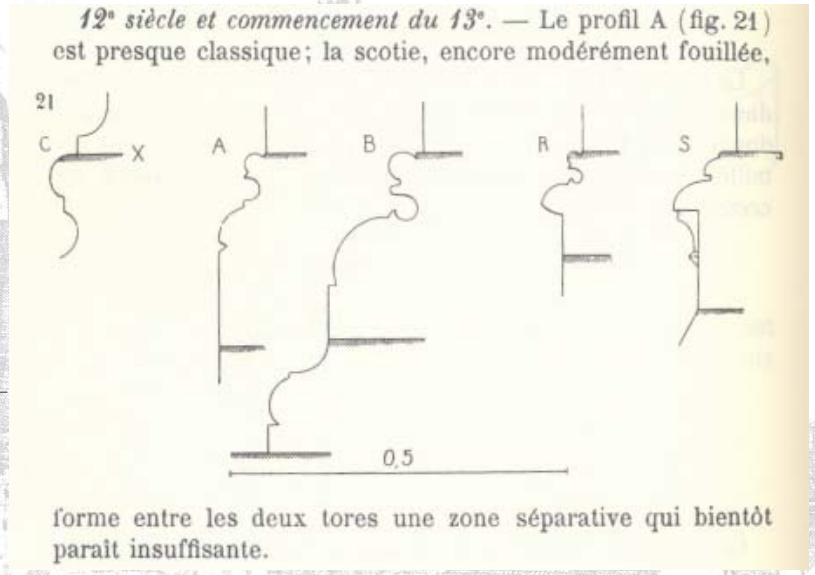


- Generic pieces of knowledge
- Specific sets of information (provided by documentary sources)
- Observation of the artefact itself (as time left it for us to see)

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?





12e siècle et commencement du 13e. — Le profil A (fig. 21) est presque classique; la scotie, encore modérément fouillée,

forme entre les deux tores une zone séparative qui bientôt paraît insuffisante.

- Generic pieces of knowledge

fuzzy indications

[1]Auguste Choisy, « Histoire de l 'Architecture » (Ed.orig 1889)

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?

???

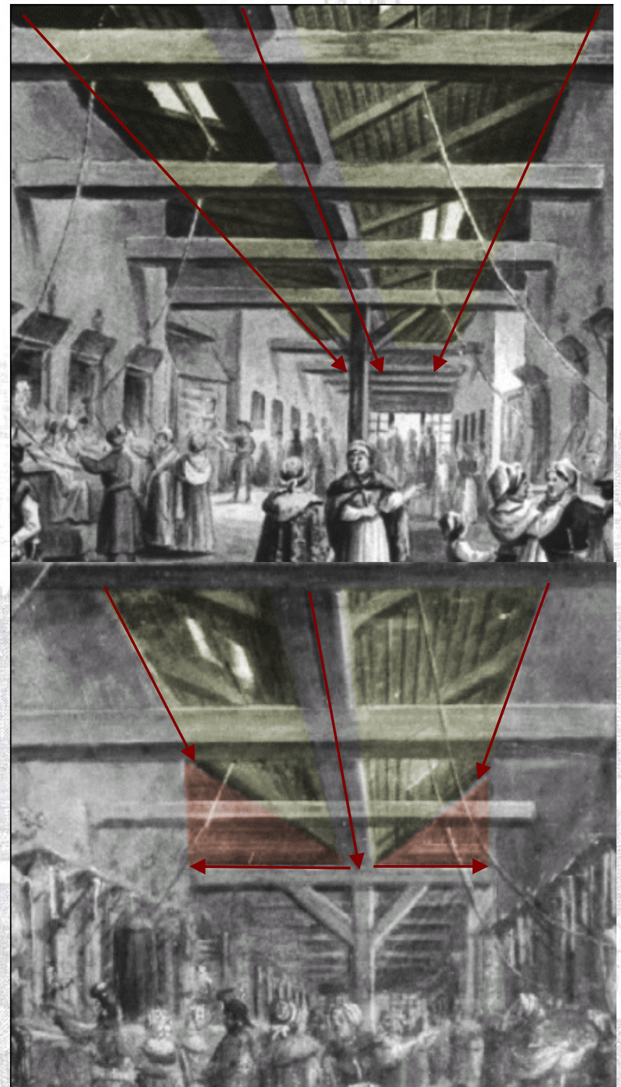
<praetorium>
<ratusz>
<rathaus>
...

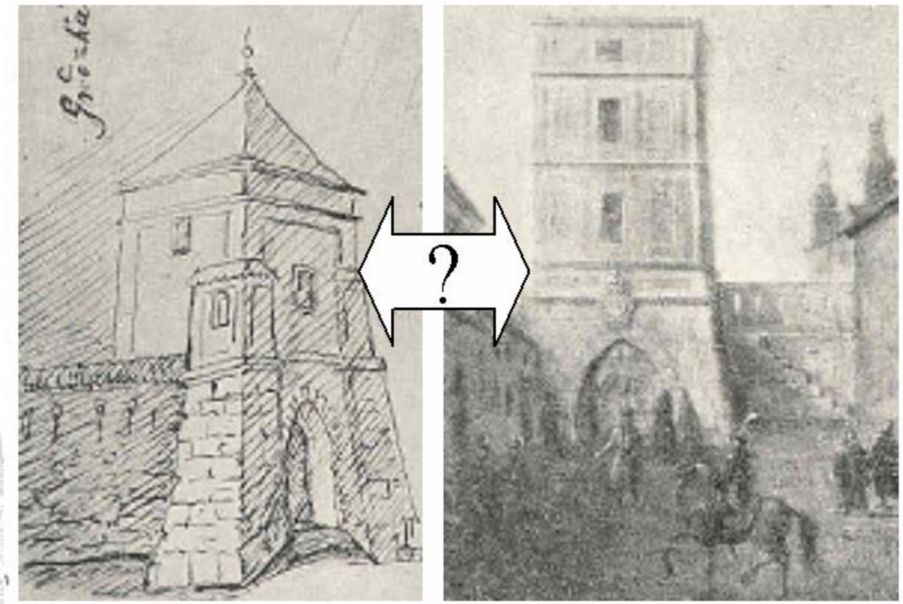
- Specific sets of information (provided by documentary sources)

Incomplete, heterogeneous, uncertain, questionable pieces of data and information

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?





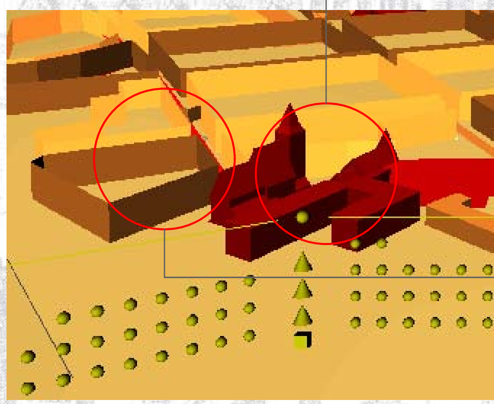
- Specific sets of information (provided by documentary sources)

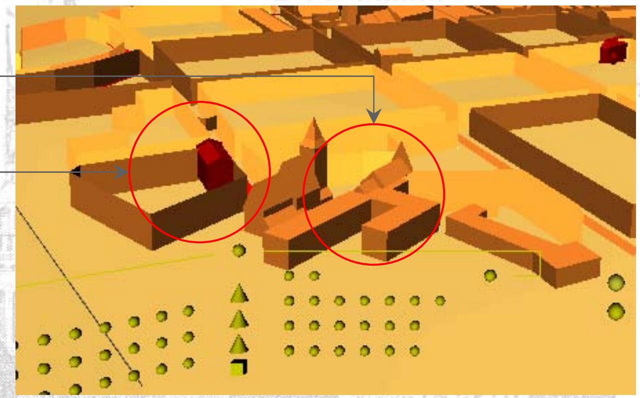
Incomplete, heterogeneous, uncertain, questionable pieces of data and information

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?

Information “better defined”





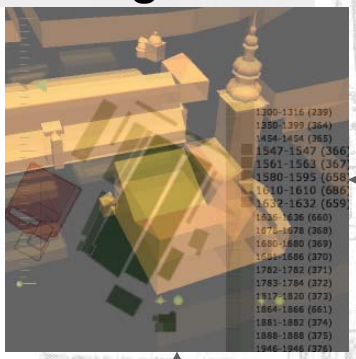
New pieces of information

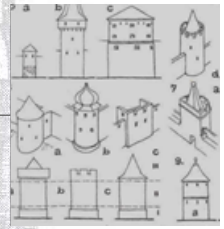
• Specific sets of information (provided by documentary sources)

Documenting the artefact : a cumulative, dynamic process

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?





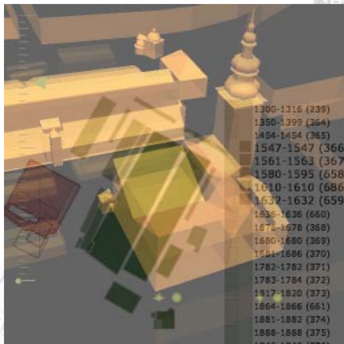
- Observation of the artefact itself (as time left it for us to see)

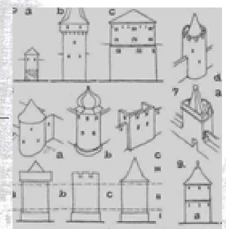
Transformations, reuse, etc..

<Linteau?>
<baie?>

On the specificity of heritage investigations

From what sources can we build such models and representations of artefacts ?





- Generic pieces of knowledge
- Specific sets of information (provided by documentary sources)
- Observation of the artefact itself (as time left it for us to see)

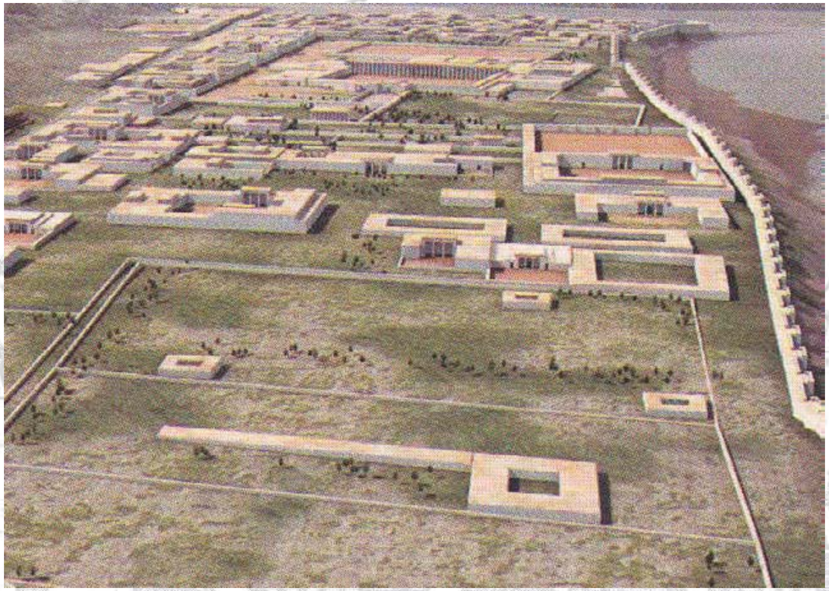
Uncertainties, doubts, questions that representations should underline if they are to become what J.Bertin calls « a work and discovery tool »

2D/3D models seen as information visualisation disposals.

Is this the main trend in 3D graphics???

On the specificity of heritage investigations

Examples that help circling the trend [caricature]



Classify by date of creation

Classify by credibility

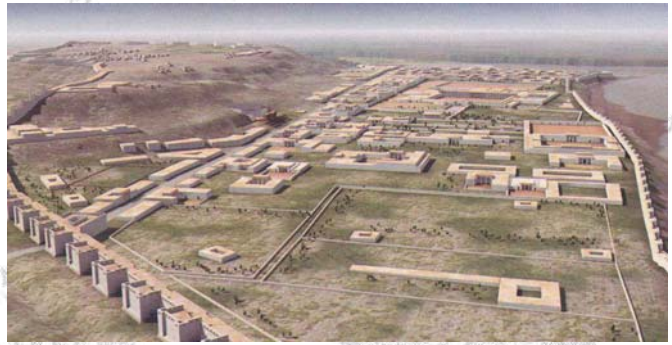
On the specificity of heritage investigations

Examples that help circling the trend [caricature]:

(1993) Information → (2004) Entertainment

P.Alkhoven [3]

TAISEI/AOROC [4]



No means to read from the graphics the info behind the shapes shown, no linkage between the knowledge and the image, ***no insight gained on the edifices or on our understanding.***

In breech of this dominant approach, which tends to hide doubts and inferences made during the research process, what we really need is to « ***Consider alternative explanations and contrary cases***[2]» and underline what we ignore as well as what we know, and this at the various stages of our investigation.

This is where tools and formalisms lack.

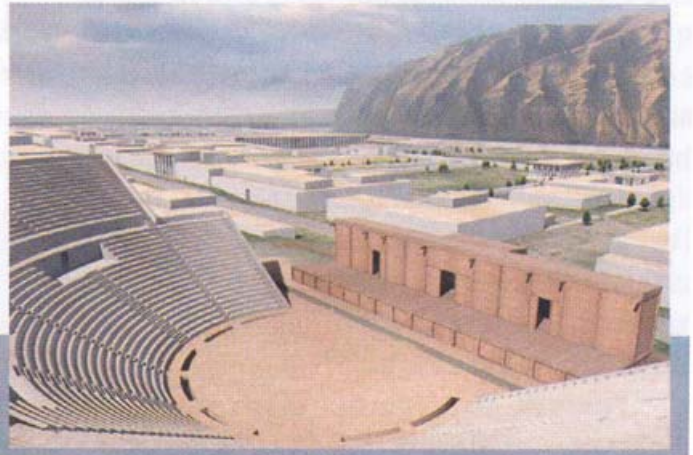
[2] E.R Tufte, « Visual explanations », Graphics Press, 1997

[3] Patricia Alkhoven «The changing image of the city» PhD Utrecht University 1993

[4] TAISEI/AOROC/ENS in journal CNRS n°178

On the specificity of heritage investigations

Si la restitution est un vecteur très efficace pour la diffusion du savoir auprès du grand public, elle présente aussi un véritable intérêt scientifique, comme l'explique l'archéologue « *Ces images sont d'une certaine façon plus exigeantes que le texte des publications car elles n'autorisent pas à éluder un problème architectural non résolu. En plus de réfléchir sur des plans, il faut aussi apporter des solutions cohérentes qui permettent une approche en volume car les bâtiments que l'on présente doivent être crédibles* ». Pour obtenir un résultat à la fois réaliste et scientifiquement rigoureux, les chercheurs doivent donc exploiter à l'extrême les informations qui ont été fournies par les fouilles. Tous les détails comptent, il s'agit de donner



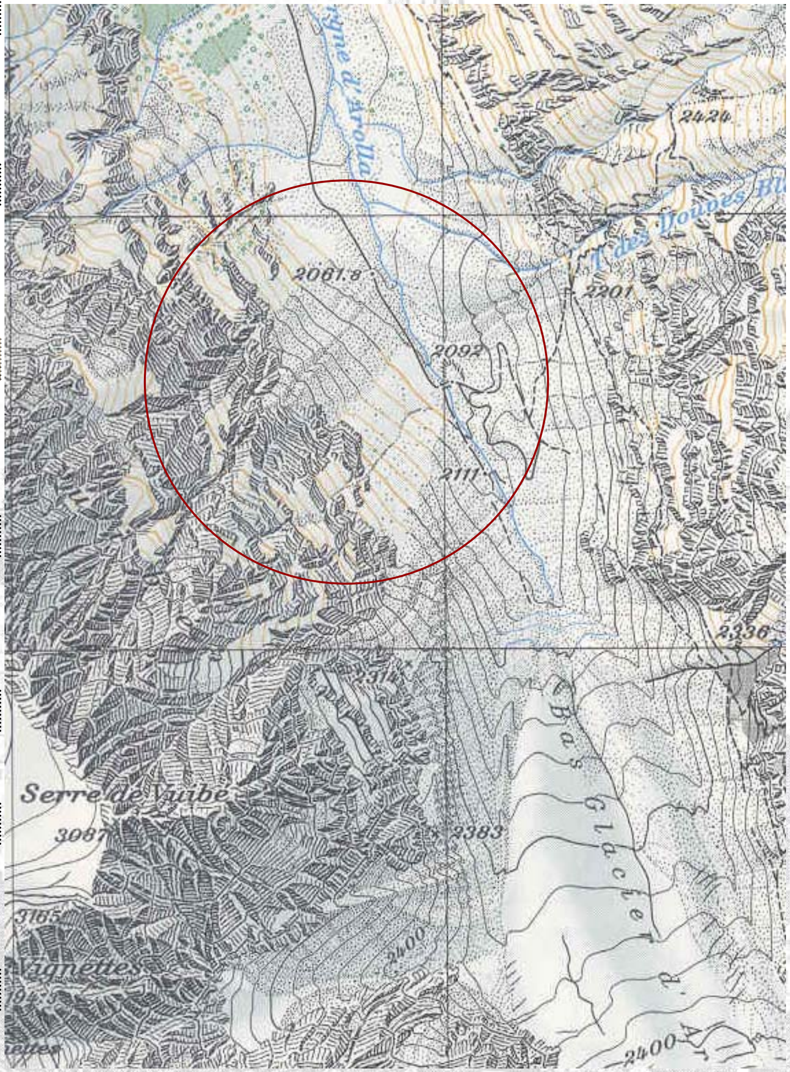
« These images are in a way more demanding than the text of a publication since they do not allow to evade from an unsolved architectural problem »

So what when we just don 't know??

If we are to deliver information, we should make choices in relation with what we know of an artefact, and avoid making choices that would be imposed by the use of a technical platform

[4] TAISEI/AOROC/ENS
in journal CNRS n°178

On the specificity of heritage investigations



Our claim : infovis provides key concepts when trying to produce information-effective graphics

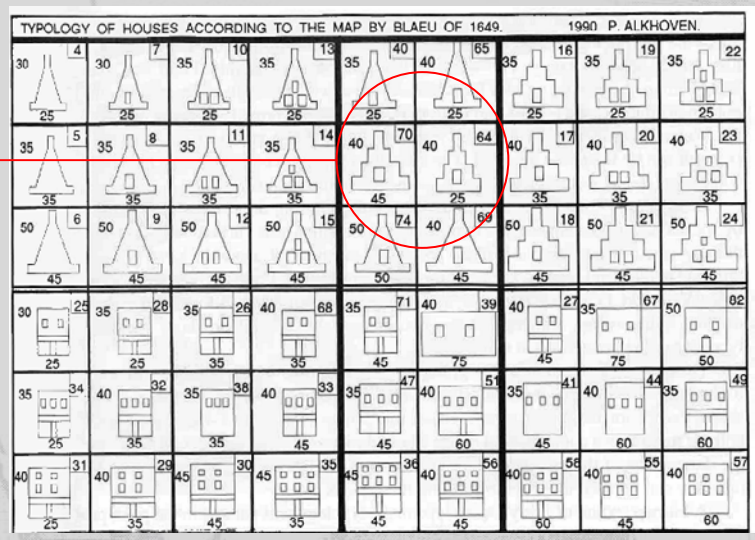
“We envision information in order to reason about, communicate, document and preserve that knowledge (…).”

“Excellence in presenting information requires mastering the craft and spurning the ideology”

E.R Tufte, « Visual explanations », Graphics Press, 1997

On the specificity of heritage investigations

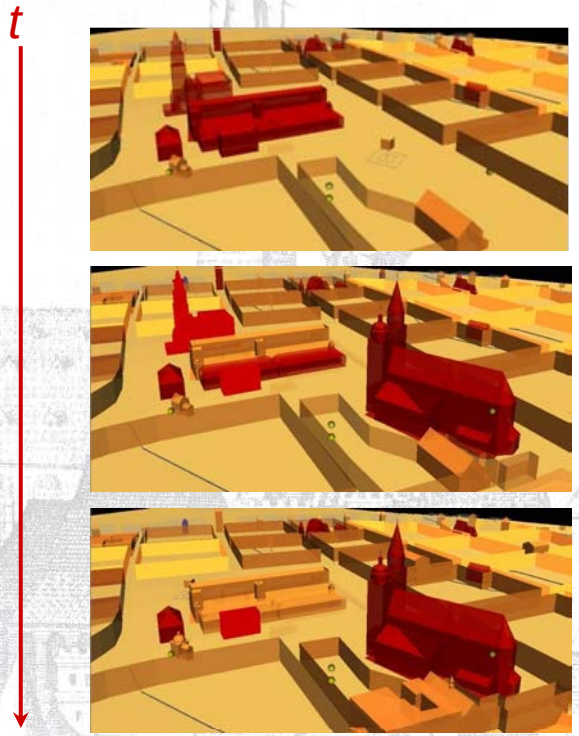
P.Alkhoven [3]



Not a technological issue, but a methodological issue

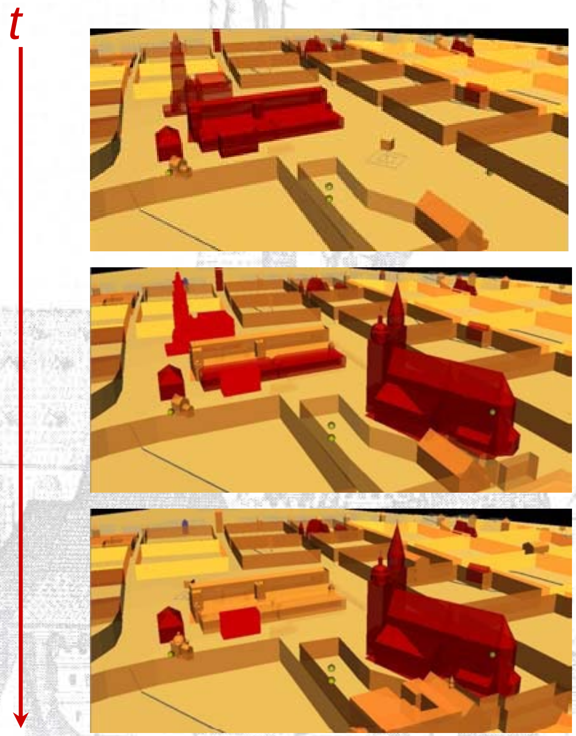
[3] Patricia Alkhoven «The changing image of the city» PhD Utrecht University 1993

Hypotheses, approach



1- The architectural *corpus*, i.e. elementary physical elements that constitute the artefact, act as a media.

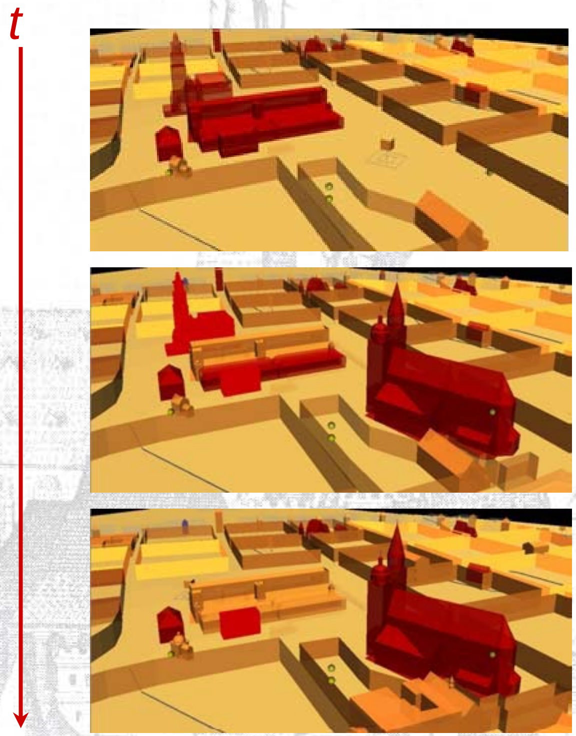
Hypotheses, approach



1- The architectural *corpus*, i.e. elementary physical elements that constitute the artefact, act as a media.

2- Since we study artefacts that are transformed / or disappeared, these elements will be poorly known, their representation will need some level of abstraction.

Hypotheses, approach



1- The architectural *corpus*, i.e. elementary physical elements that constitute the artefact, act as a media.

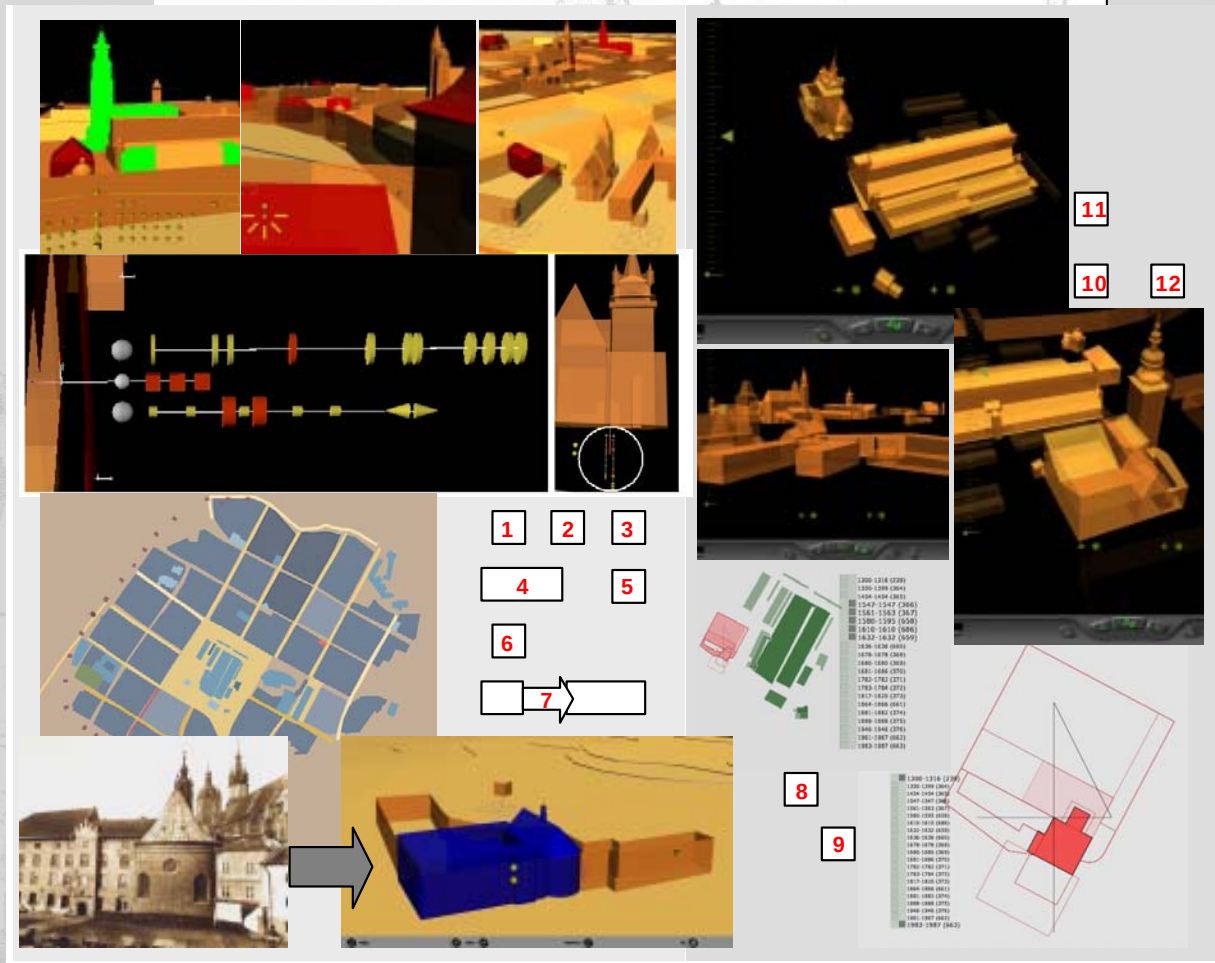
2- Since we study artefacts that are transformed / or disappeared, these elements will be poorly known, their representation will need some level of abstraction.

3- Inside 2D / 3D models, these elements will allow information retrieval (users may query data and info element by element), but also will allow the visualisation of an information localised in time (the period investigated, the moment in our investigation) and space.

Hypotheses, approach

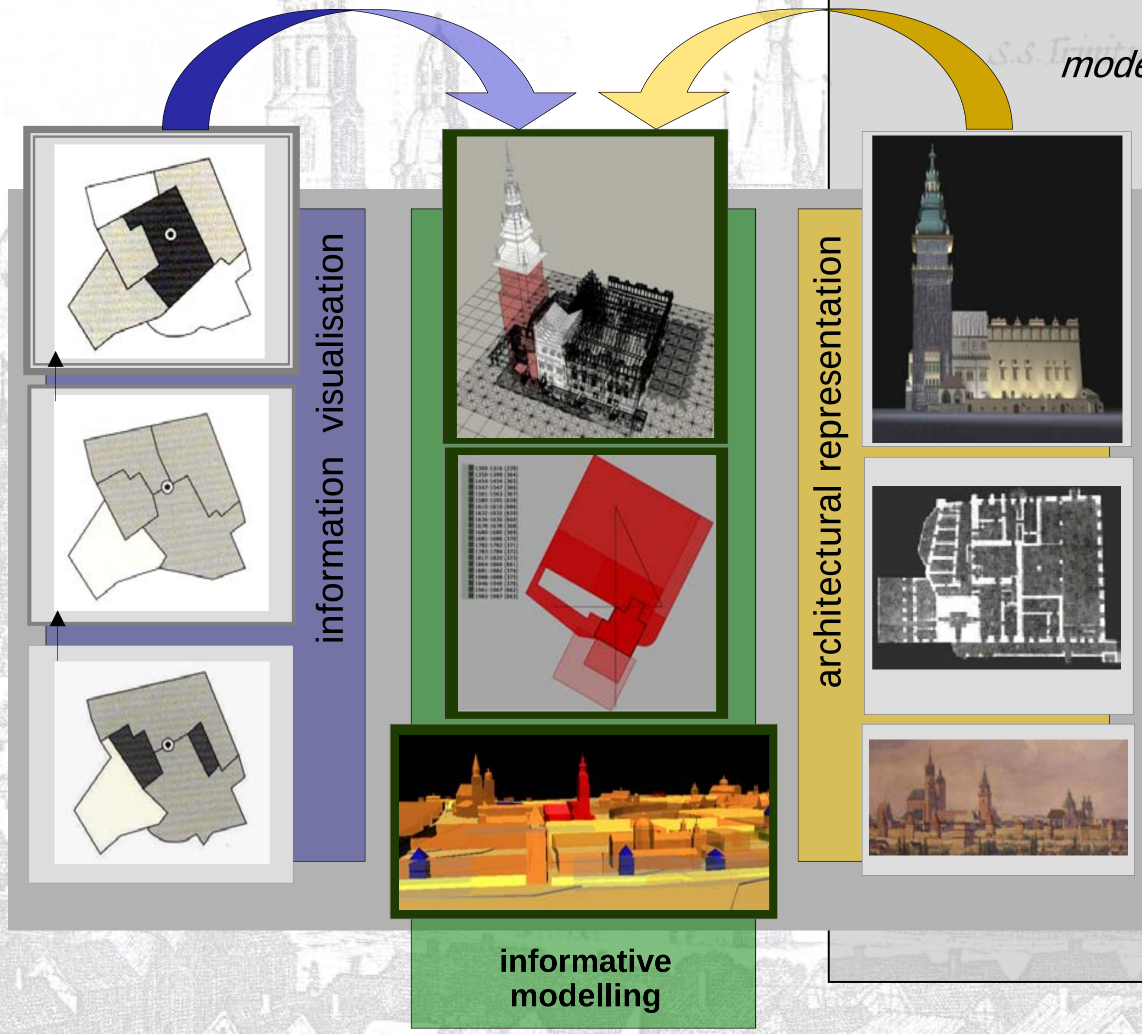
Representing, beyond the artefact itself, what we know about the artefact and [hopefully] *amplify cognition* through visual means

J.Bertin's "discovery tool"

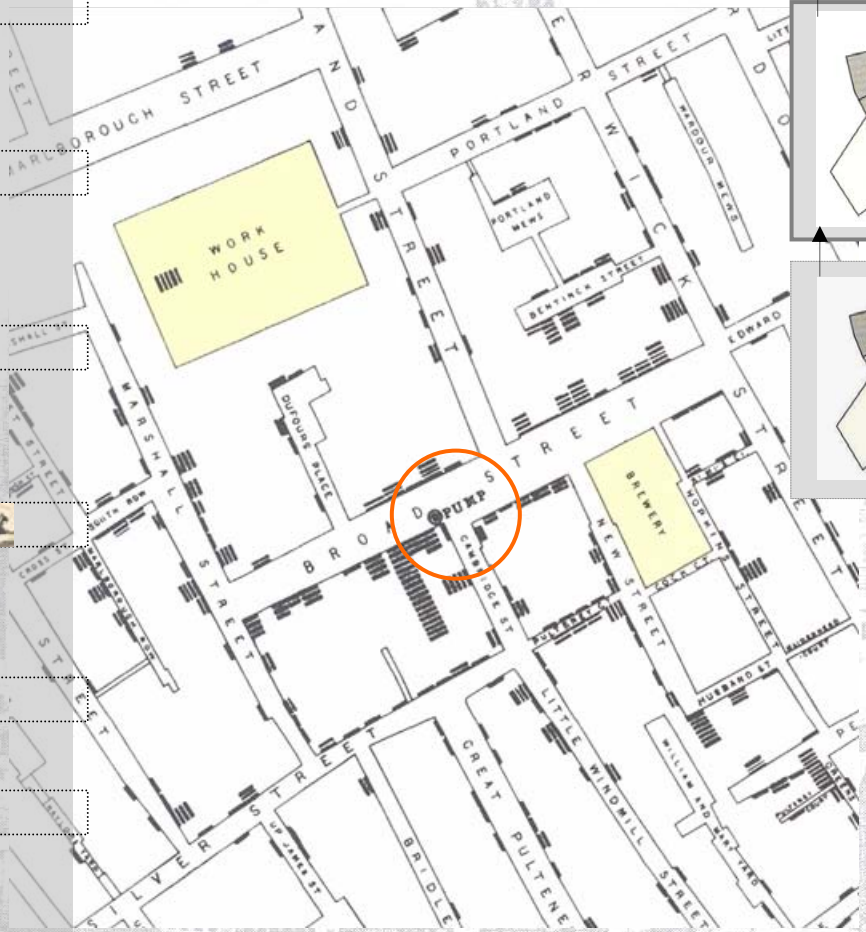


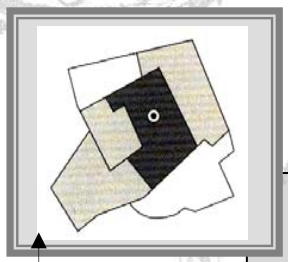
Approach

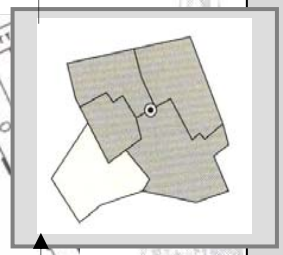
Finding a way in between information visualisation and architectural modelling/representation

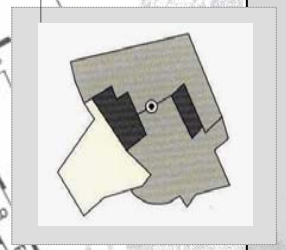


Approach, origins









information visualisation, with its need for abstraction, already has to do with spatial data

The 1854 Cholera epidemic in London[1]

« Put the data in an appropriate context to evaluate causes and effects »

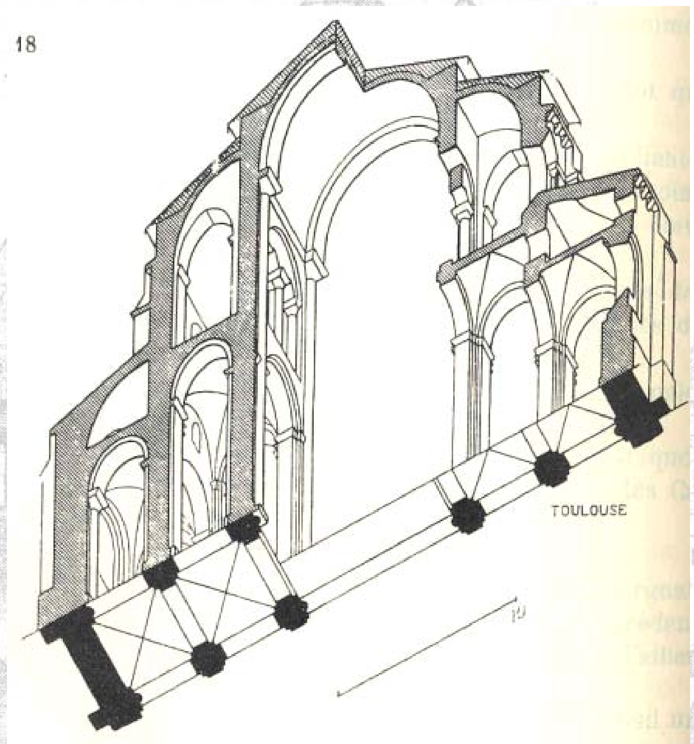
« Make quantitative comparisons »

« consider alternative explanations and contradictory data »

Lessons to learn when dealing with architecture and its evolution? Not the dominant practice in handling 3D data

[1]E.R Tufte, Visual Explanations Graphics Press/ Cheshire (1997)

Approach, origins

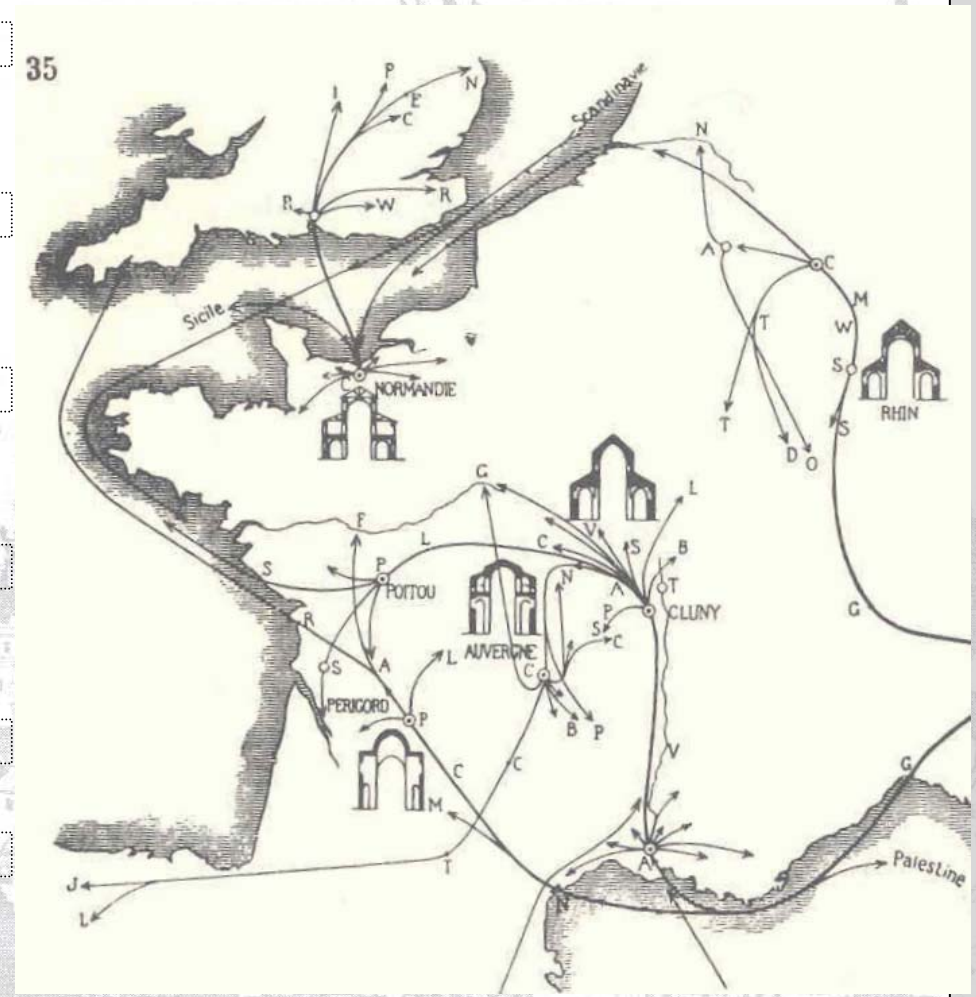


A. Choisy Histoire de l'architecture
Inter-Livres 1991 (ed.orig 1899).

Architectural representation, with its tradition of figuration, already has to do with enhancing information readability

A section intended at visual explanation

Approach, origins

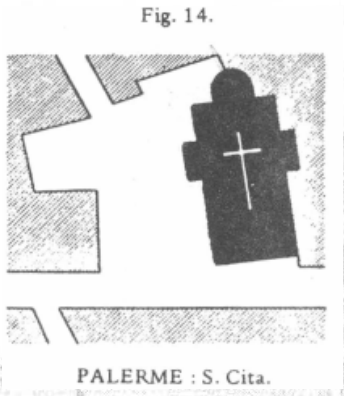


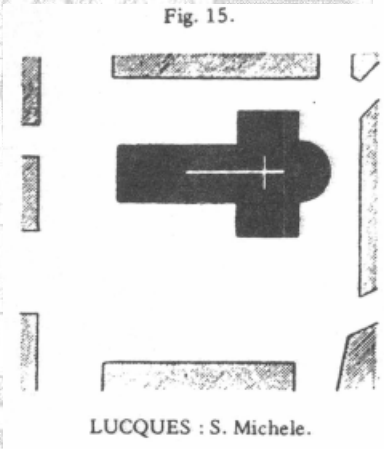
A. Choisy Histoire de l'architecture
Inter-Livres 1991 (ed.orig 1899).

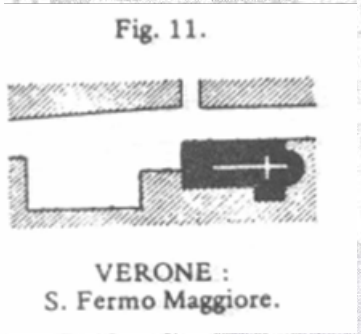
Architectural representation, with its tradition of figuration, already has to do with enhancing information readability

Figuration intersects spatial distribution and evolution

Approach, origins





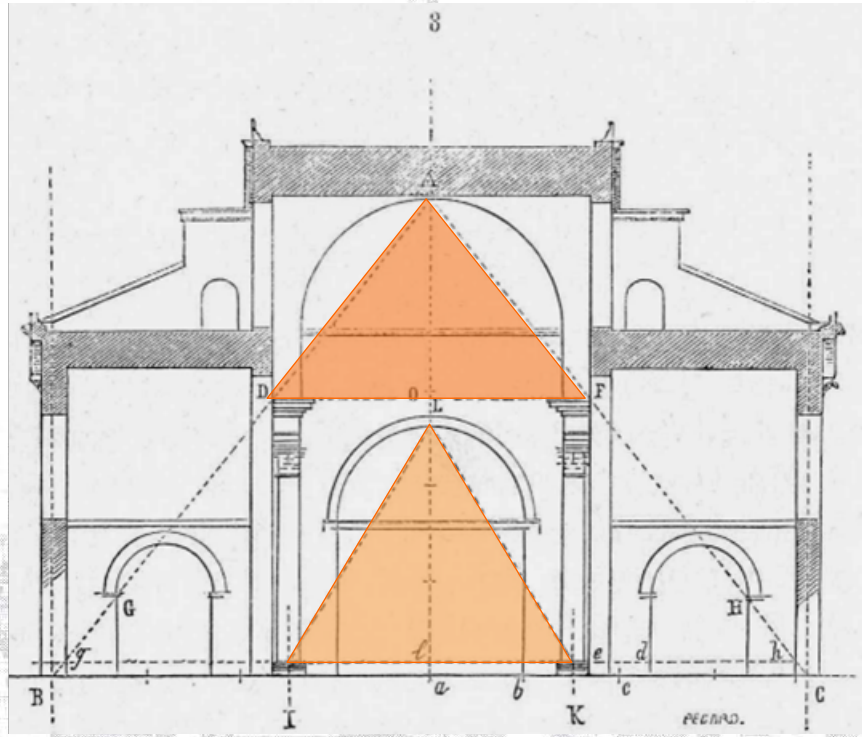


C. Sitte, City Planning According to Artistic Principles (1889), Trad GR. Collins C Collins (Phaidon, 1965)

Architectural representation, with its tradition of figuration, already has to do with enhancing information readability

Visual comparison

Approach, origins



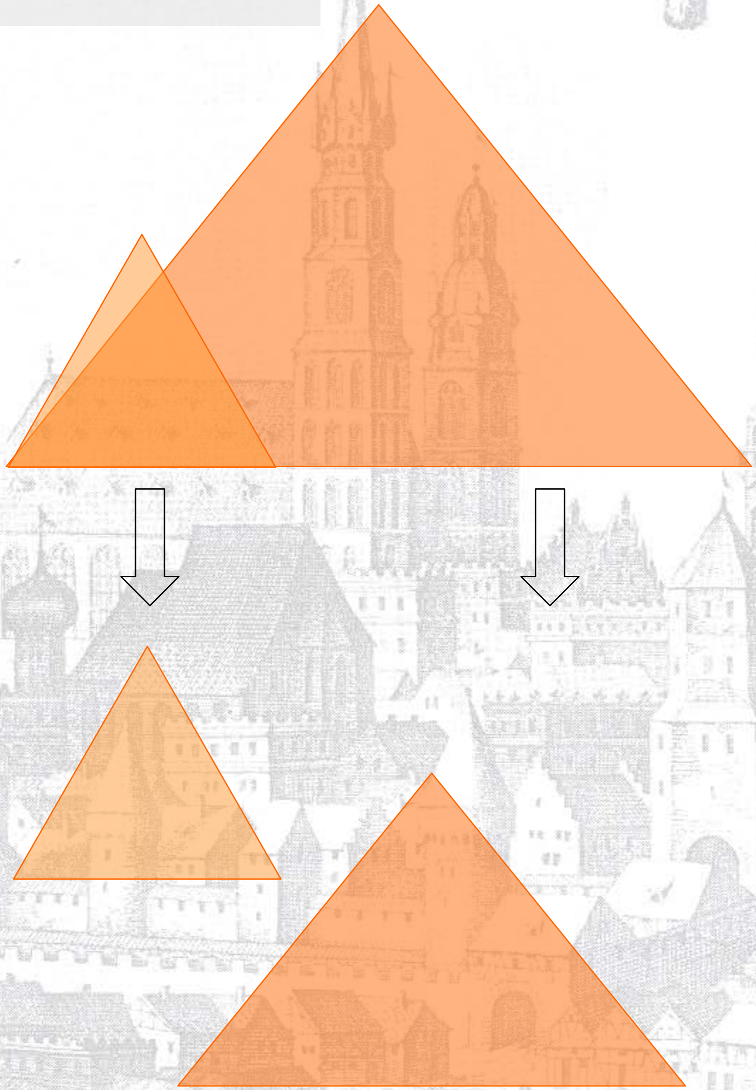
Nous voyons (fig. 8) que les apothèmes AB, AC donnent les axes des murs de fermeture B et C et la hauteur de la corniche du grand ordre, par leur rencontre avec le nu des murs percés de grands arcs formant les latéraux en D et F. Ces côtés AB, AC donnent aussi les naissances G et H des petits arcs des latéraux. Les deux colonnes IK étant posées, élevant de l'axe de ces colonnes au-dessus des bases un triangle équilatéral IKL, nous avons la hauteur de l'intrados de la clef de l'arc de la tribune. Prenant moitié *ab* d'une des 4 divisions de la base du triangle ABC, nous avons les pieds-droits de cette tribune. Quant au point diviseur par quart *c*, il donne l'axe de la pile ED.

E.Viollet Le Duc, E. Entretiens sur l'architecture
Editions Pierre Mardaga, Brussels, 1977 (ed.orig 1863).

Architectural representation, with its tradition of figuration, already has to do with enhancing information readability

Visual analysis and contradictory data assessment

Approach, origins



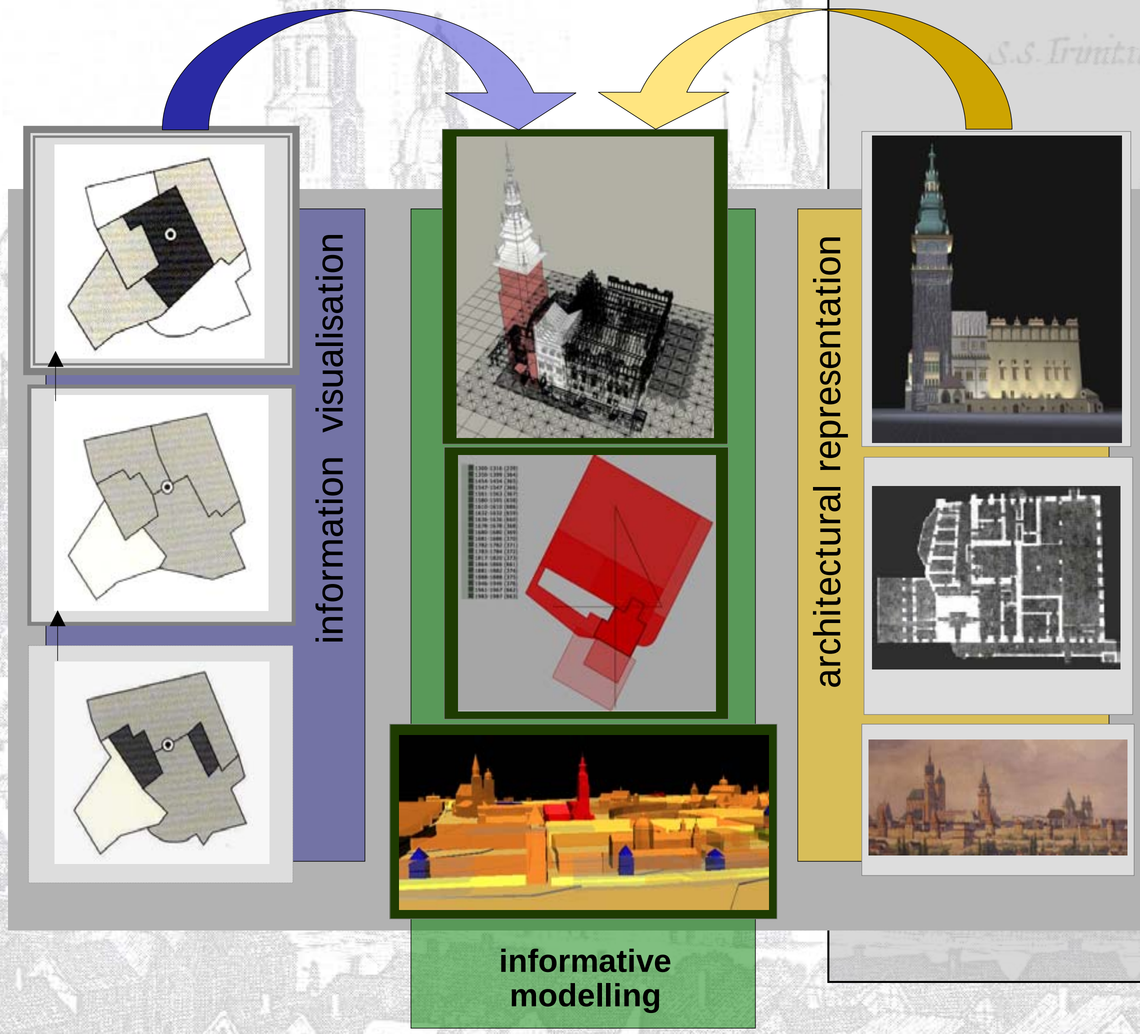
Architectural representation, with its tradition of figuration, already has to do with enhancing information readability

Visual analysis and contradictory data assessment

E.Viollet Le Duc, E. Entretiens sur l'architecture
Editions Pierre Mardaga, Brussels, 1977 (ed.orig 1863).

Informative modelling

Walking in their footsteps,
but with (against) computer
solutions




POLONIÆ URBS CELEBERRIMA AIQREGIA ATQUE ACADEMIA INSI
CRACOVIA
CLEPARDIA
STRADONIA

Theatres e

Theatres e

enable visual comparisons

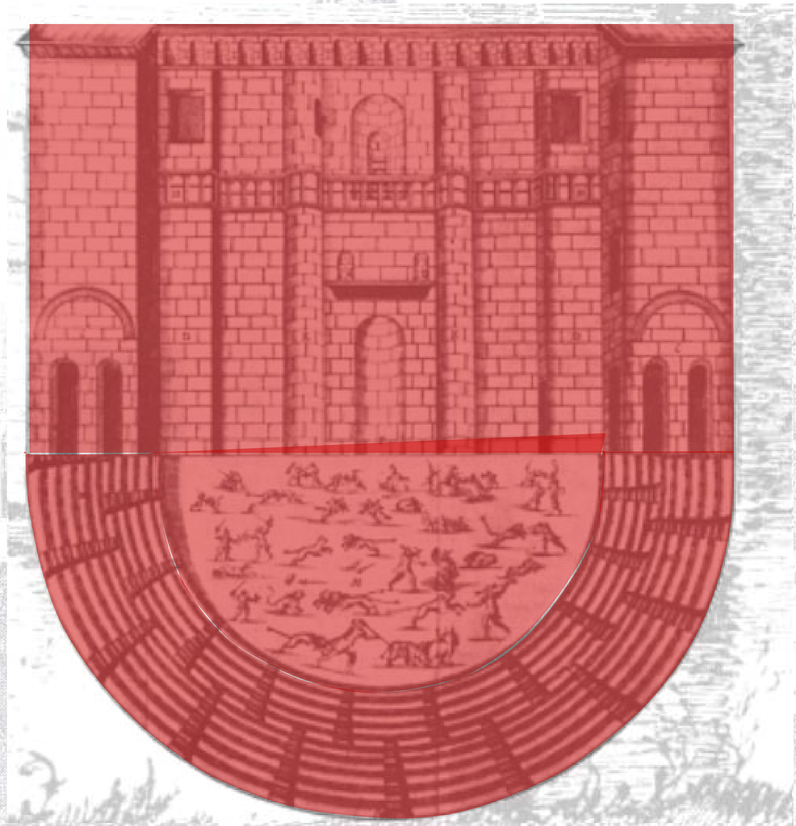
delineate specific parameters

I : formal analysis

II : spatial distribution

III : visual tools

Theatres experiment



[**R. Alleau** *Guide de la Provence mystérieuse*, Éditions Princesse, collection *Les guides noirs*, 1982]

An antique theatre is composed from three basic elements :

- scenea
- orchestra
- cavea

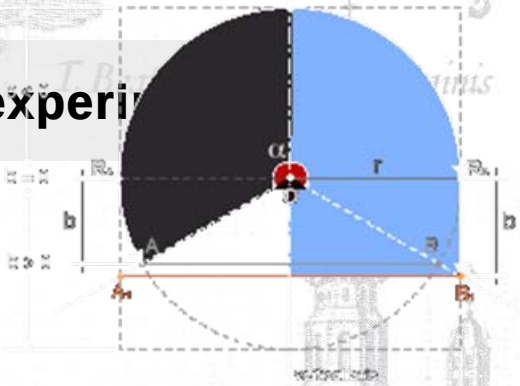
analyse of the elements of variation

define the parameters of comparison

Theatres experi

I : formal analysis

variations of orchestra



O = geometrical centre at the orchestra's construction

A, B = the points of orchestra's delimitation

R_A, R_B = diameter markers

r = radius

α = angle $\widehat{AB}$

$\overline{AB}$ = distance between the points A and B

b = vertical distance between the orchestra delimitation points (A, B) and the diameter markers (R_A, R_B)

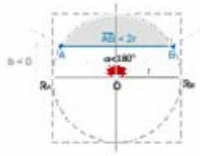
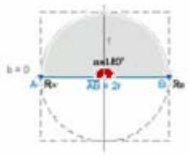
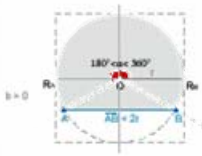
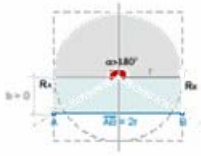
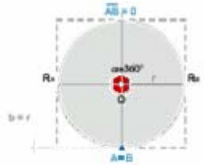
Or = [?] difficulties with an interpretation of the archeological remains

Or = [T] only textual descriptions

Parametres, set I

Parametres, set II

Parametres, set III

	1	2	3	4	5
Parametres, set I					
r	r	r	r	r	r
α	$0 < \alpha < 180°$	$\alpha = 180°$	$180° < \alpha < 360°$	$\alpha > 180°$	$\alpha = 360°$
$\overline{AB}$	$\overline{AB} < 2r$	$\overline{AB} = 2r$	$\overline{AB} < 2r$	$\overline{AB} = 2r$	$\overline{AB} = 0$
b	$b < 0$	$b = 0$	$b > 0$	$b > 0$	$b = r$

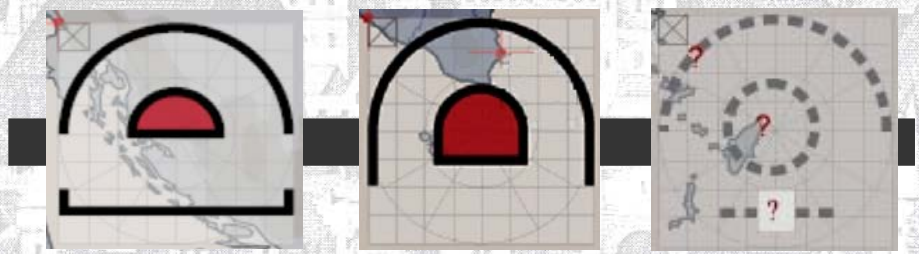
Typo-plan

1	2	3	4	5	6	7
Or < 180°	Or = 180°	Or > 180° Ou	Or > 180° Pr	Or = 360°	Or = [?]	Or = [T]

Symbol	1	2	3	4	5	6	7
							

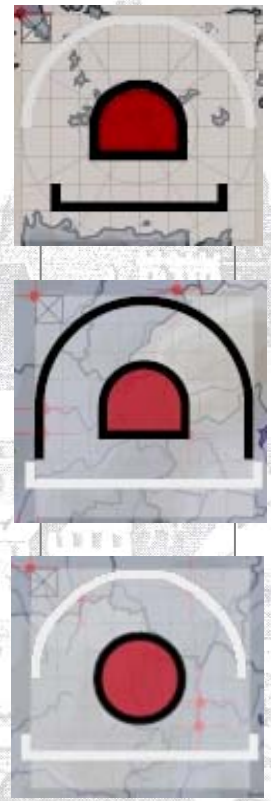
Theatres experiment

- each of the three components of a theatre can be described
- the visual sign that identifies the object's typology can be dynamically produced



Grey dashed line marks elements the shape of which is difficult to be given.

No scenea in the symbol: shows we know no such structure existed there (hereHeraclea Minoa)



White element in symbol: shows lacking information in DB

Theatres experiment

toponimical hierarchy

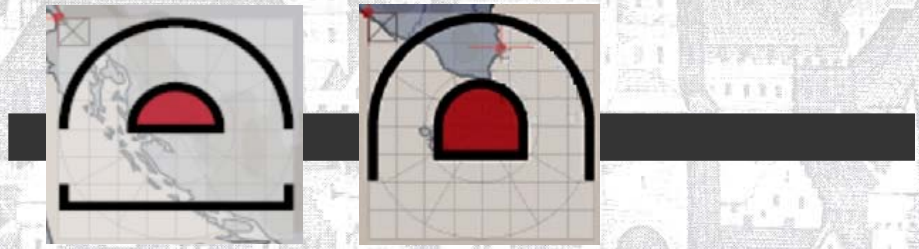
SVG path

SVG path

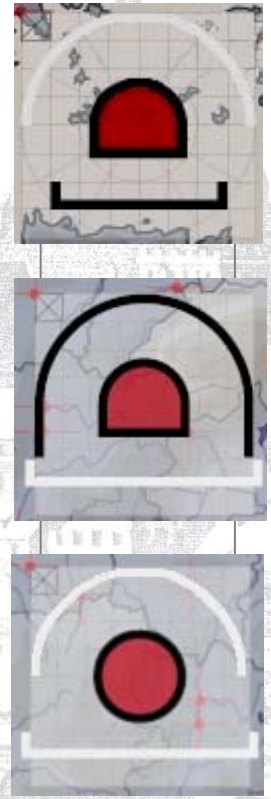
europe/italy/valledAosta/Aosta/...

SVG path

SVG path



No scenea in the symbol: shows we know no such structure existed there (hereHeraclea Minoa)

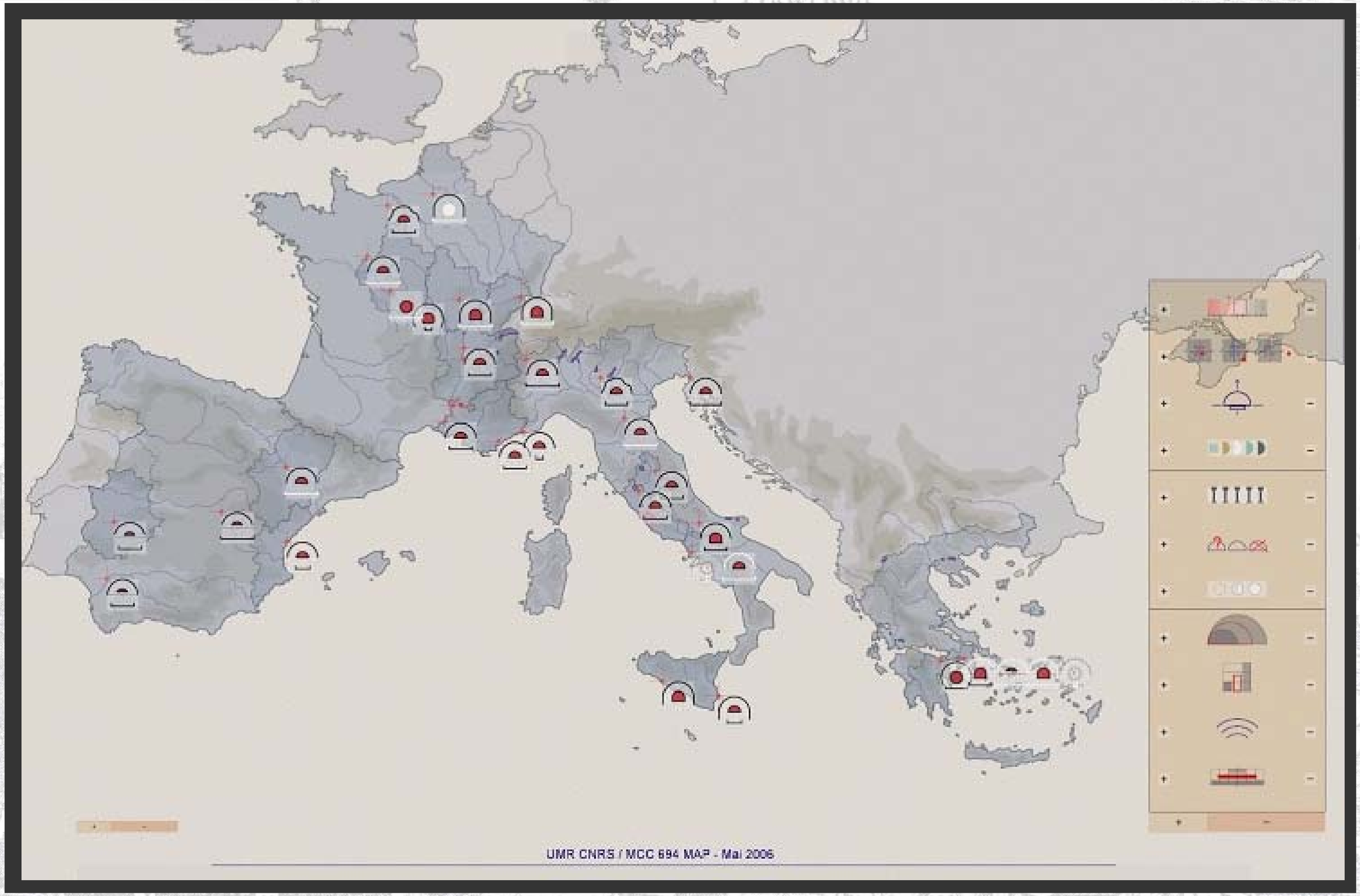


White element in symbol: shows lacking information in DB

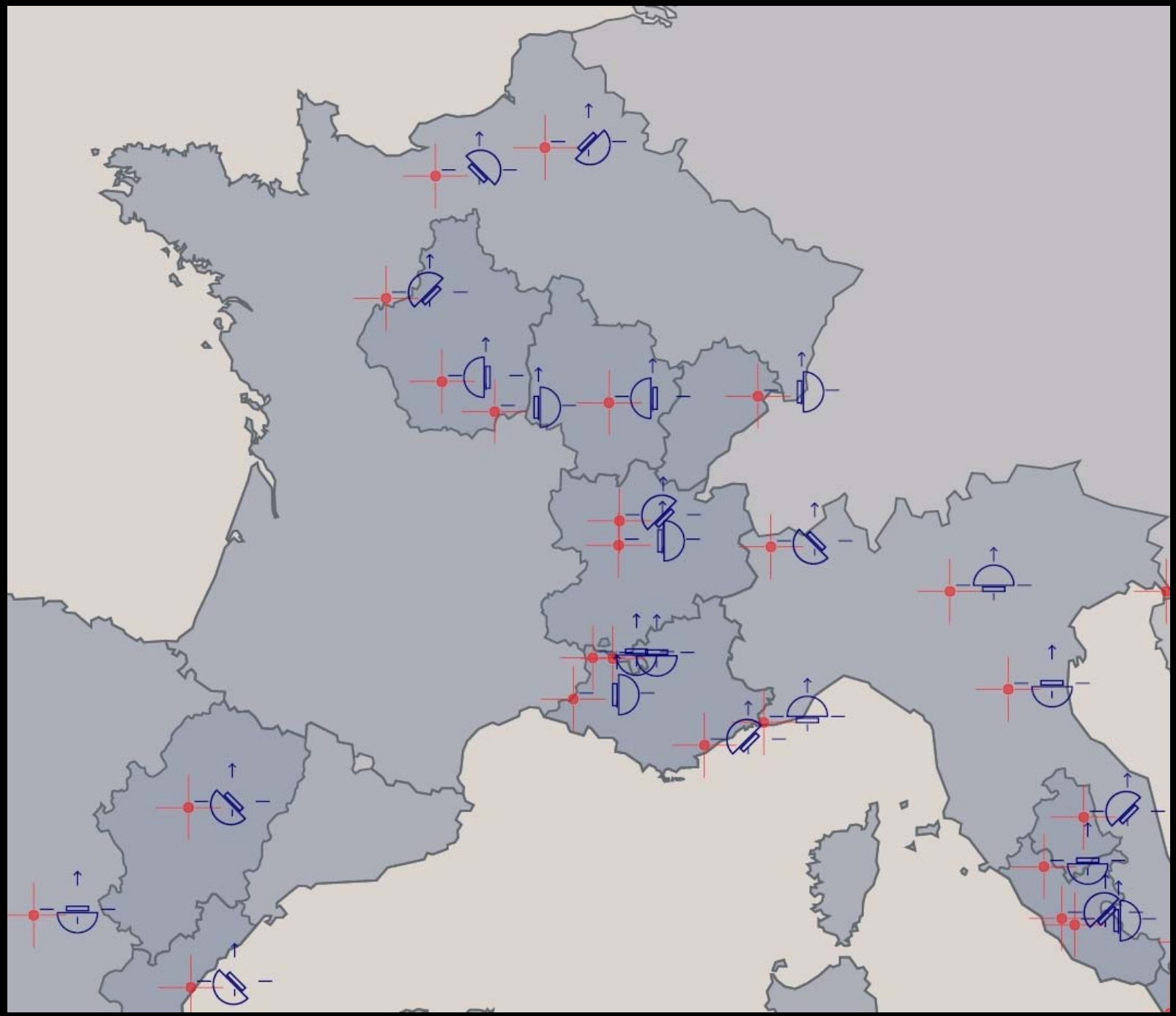
Theatres experiment

II : spatial distribution

toponimical map

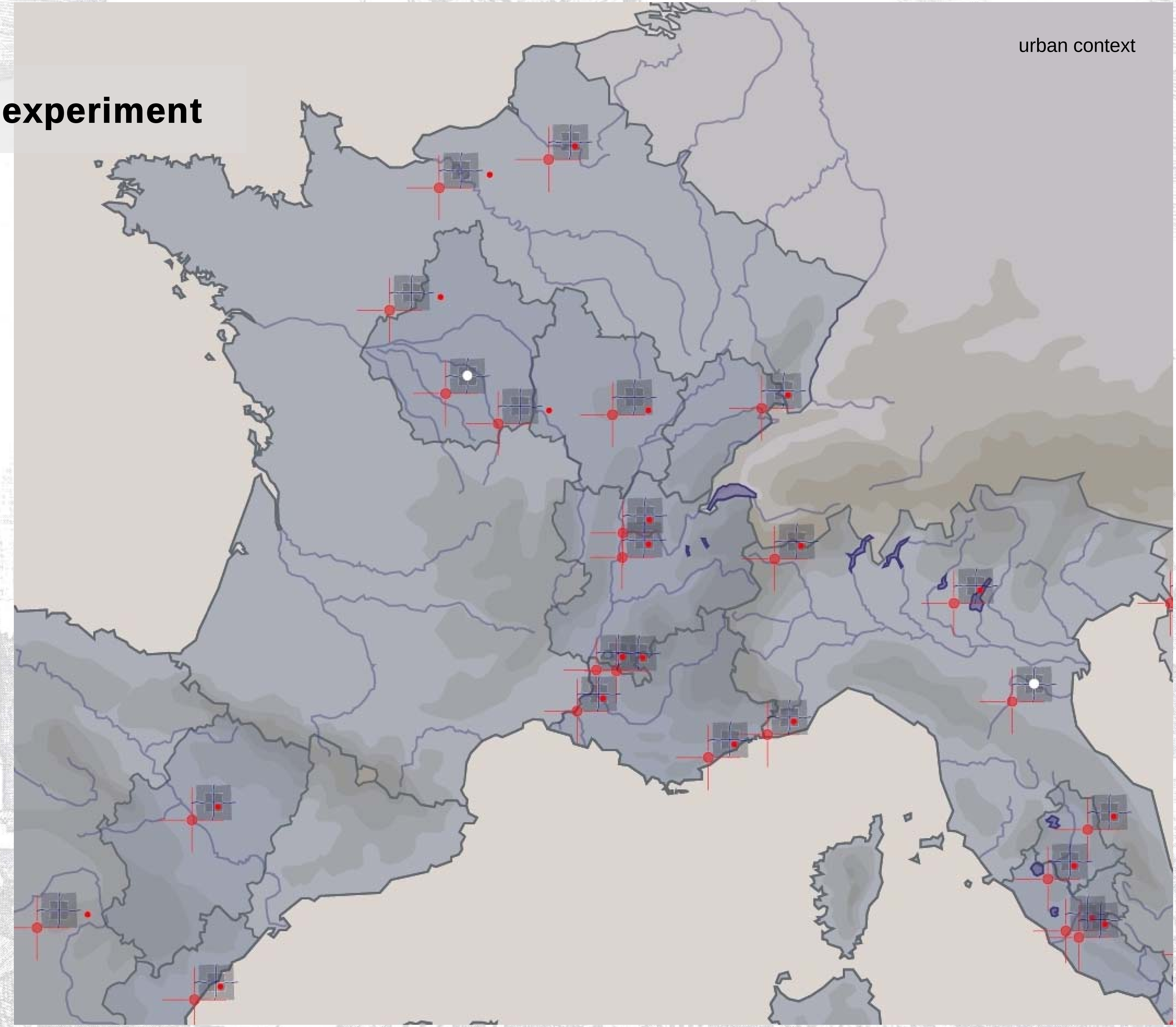


for each theatre we can distribute in space a visual sign (typological family)

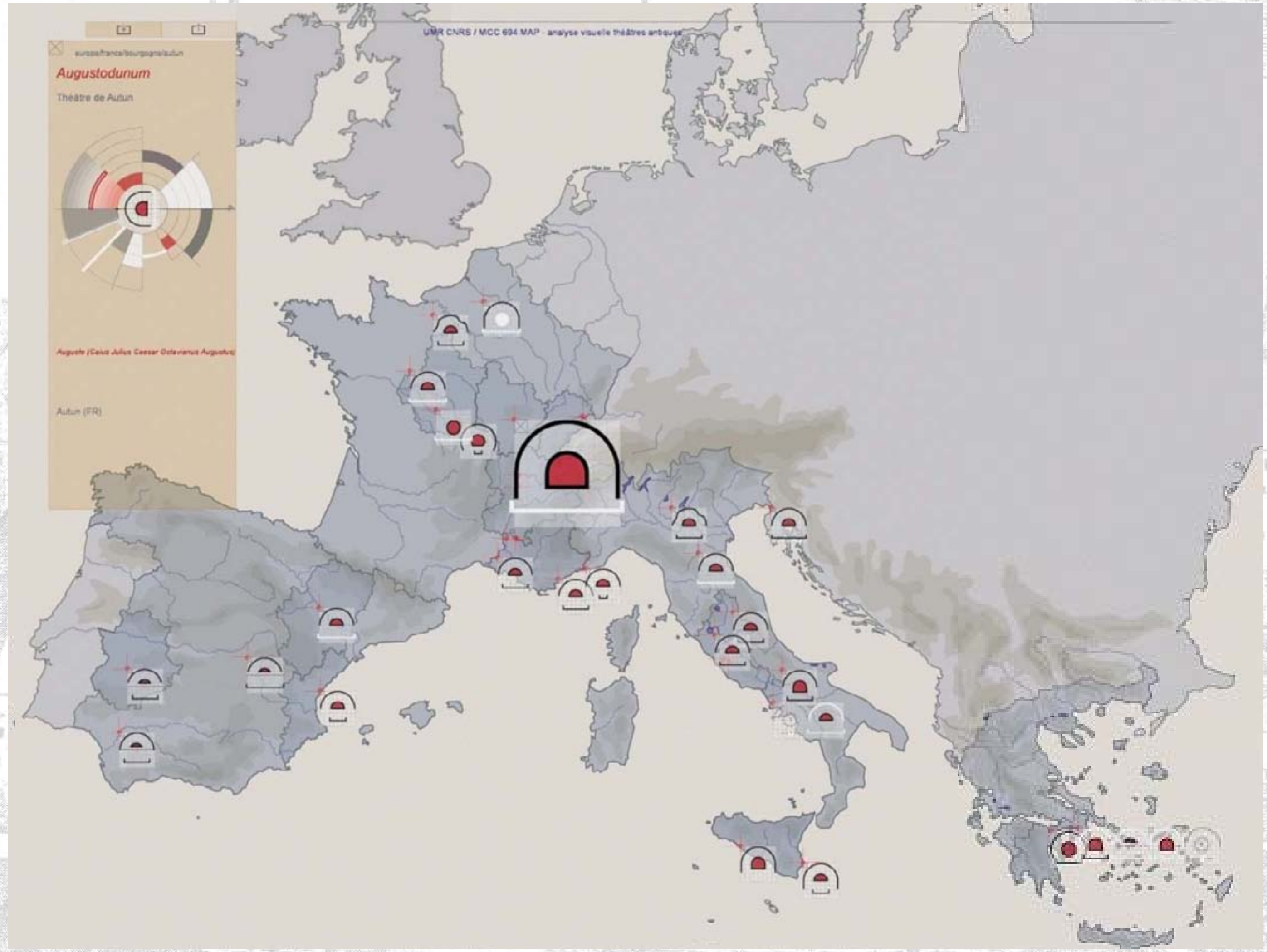


Theatres experiment

urban context

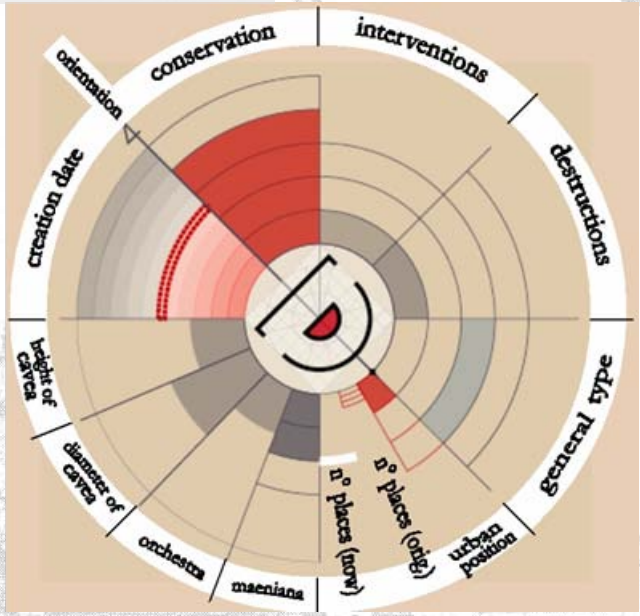


Theatres experiment



JY Blaise I Dudek UMR CNRS/MCC 694 MAP : Marseille

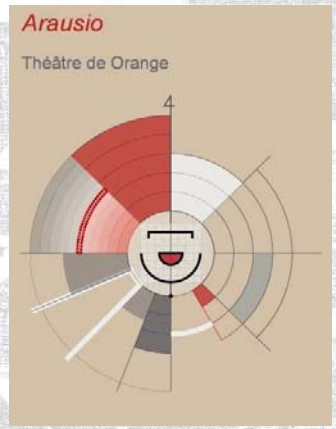
Theatres experiment



Each theatre is described by a "*visual signature*" - summarises the information that we have about a theatre and not a vision of a physical objet itself.

In this experiment, a unique source :

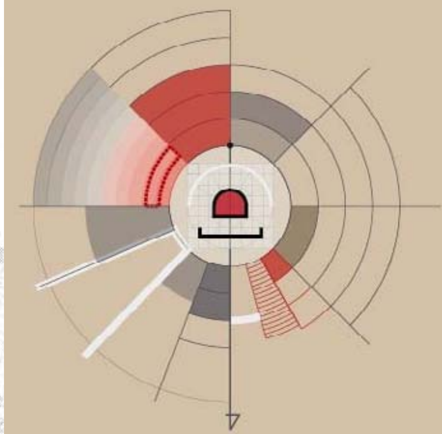
- P. Ciancio Rossetto, G. Pisani Sartorio: *Teatri greci e romani. Alle origini del linguaggio rappresentato* - SEAT, Roma 1994



The date does not make the shape
The type does not make the urban position

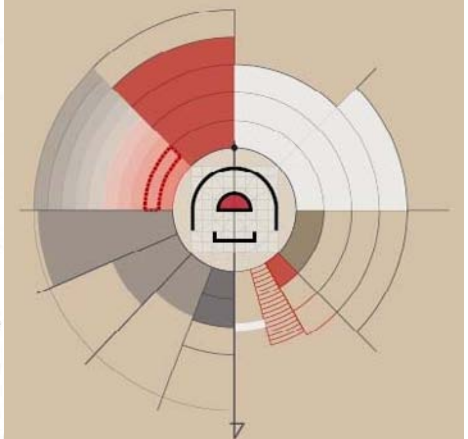
Athenae

Théâtre d'Athènes



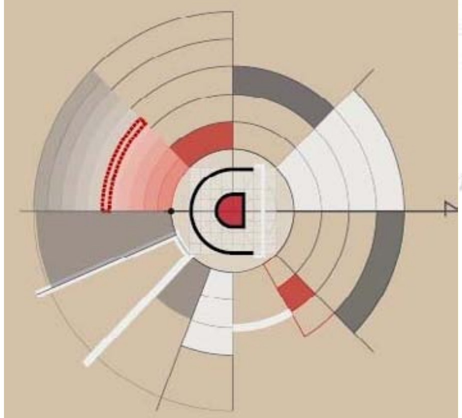
Syracusae

Théâtre de Syracuse



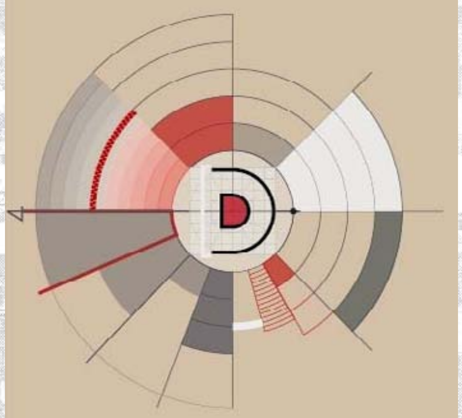
Augustodunum

Théâtre de Autun



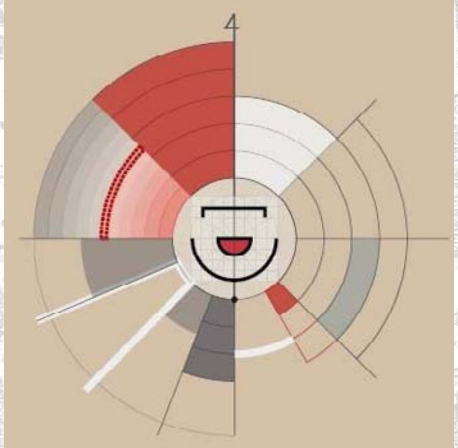
Epomanduodurum

Théâtre de Mandeure



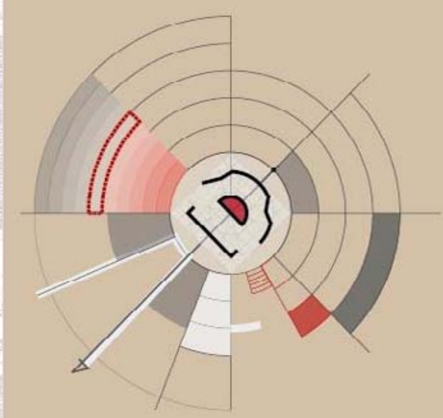
Arausio

Théâtre de Orange

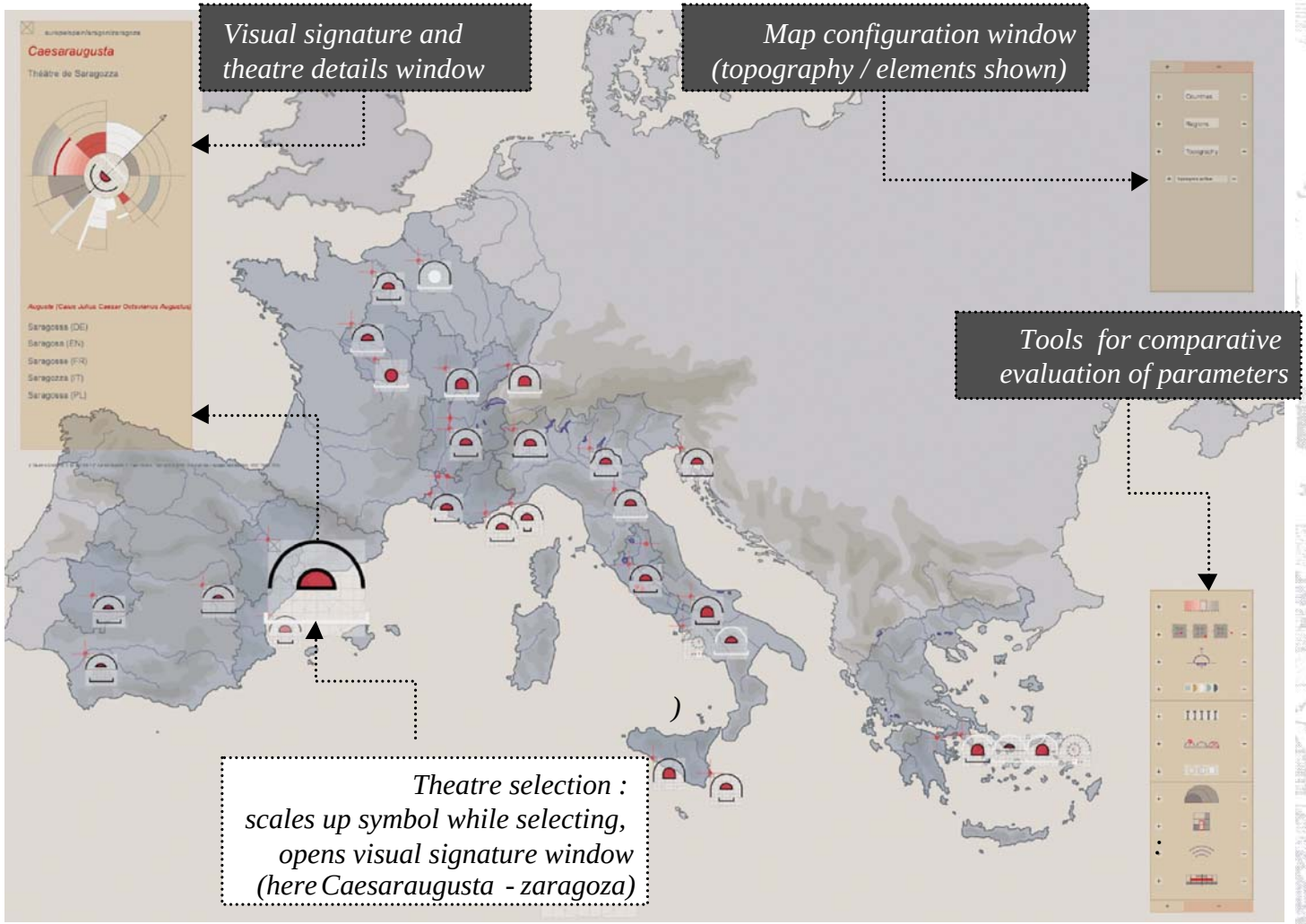


Canetonum

Théâtre de Berthouville

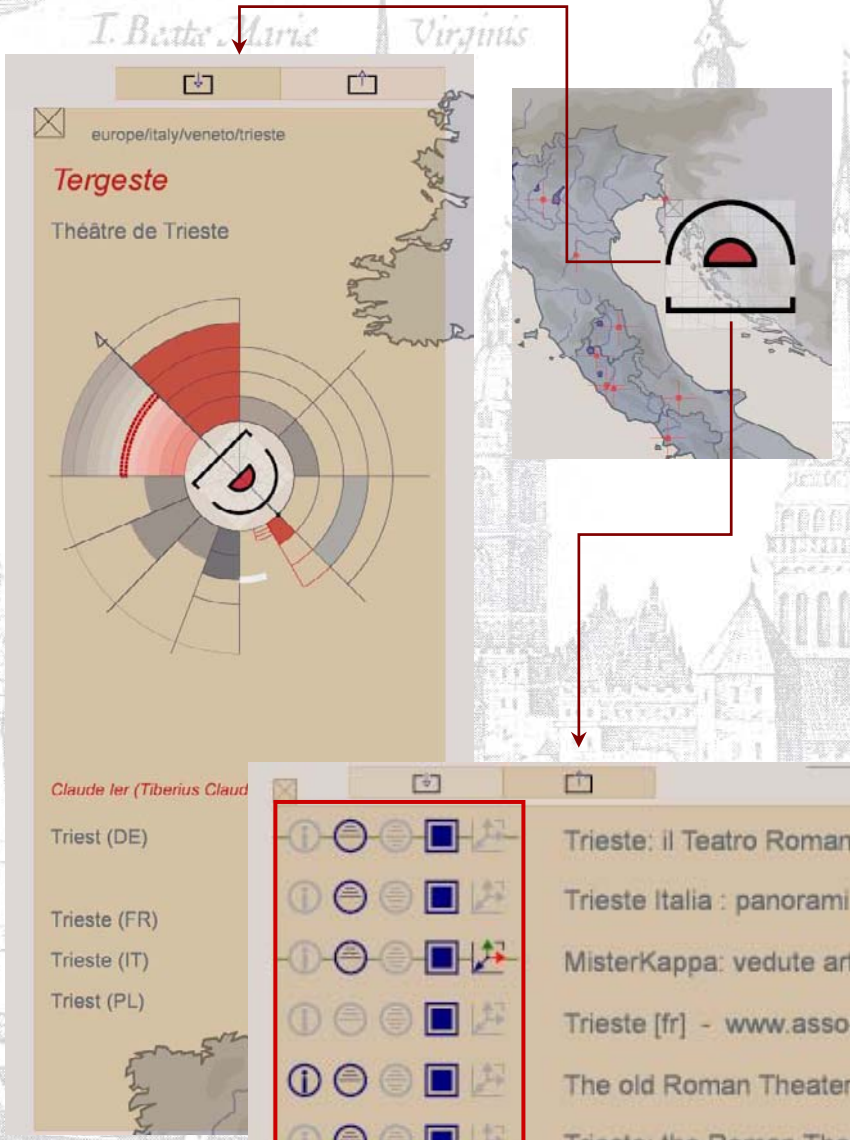


Theatres experiment



III : visual tools

elements of the interface

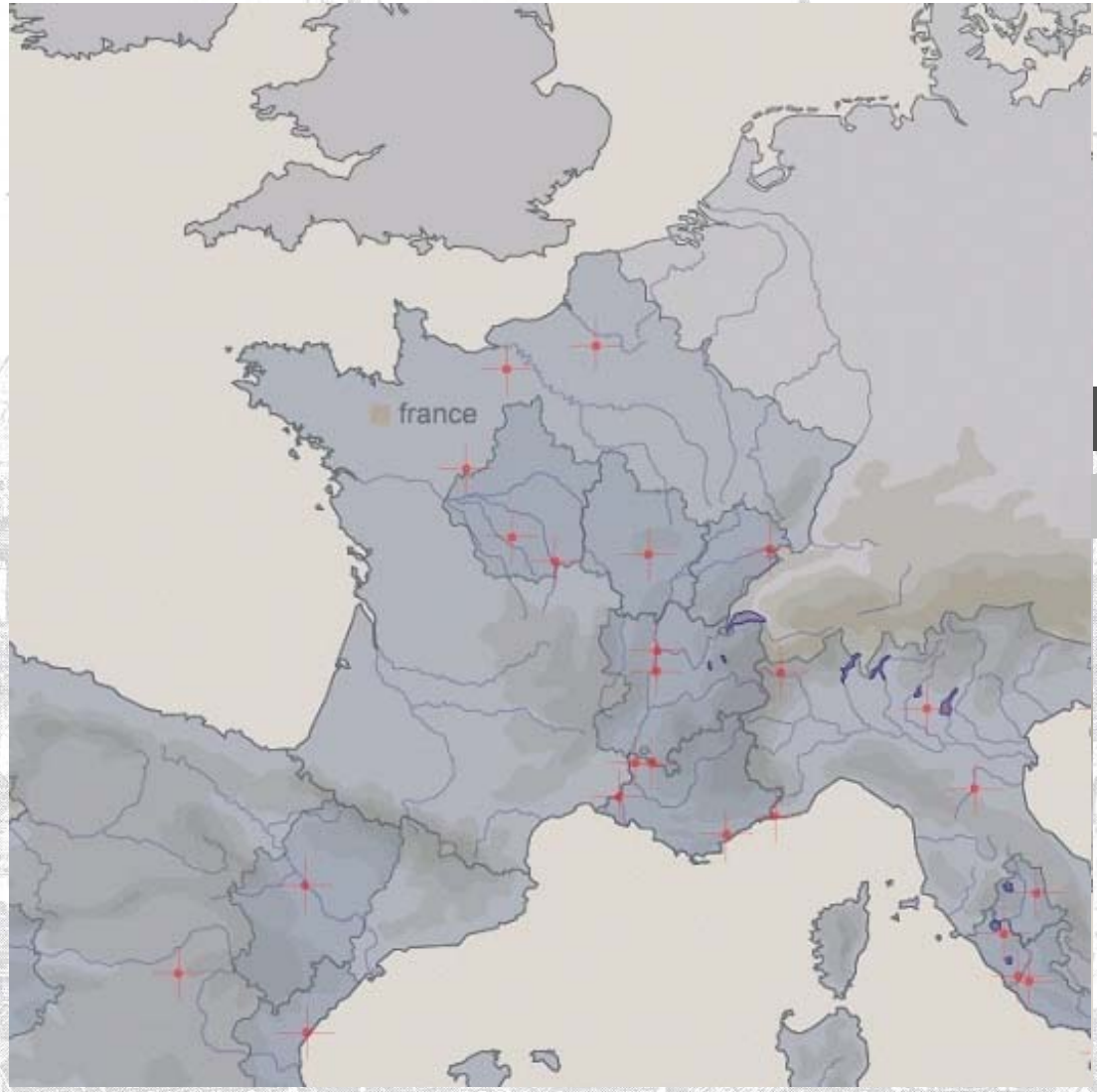


links content description

Theatres experiment

implementation

combination of standards and freeware technologies



Theatre typo DB

Perl script

SVG, Javascript

Toponymy

XML / XSLT

hierarchy of Perl classes

SVG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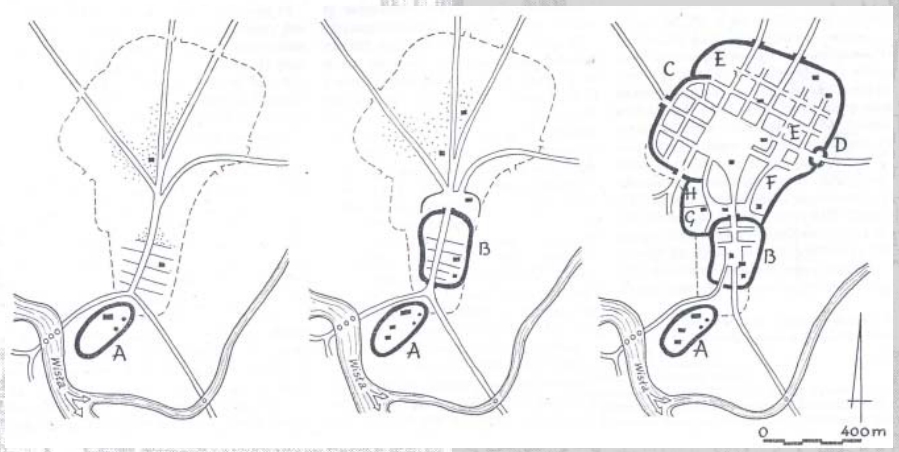
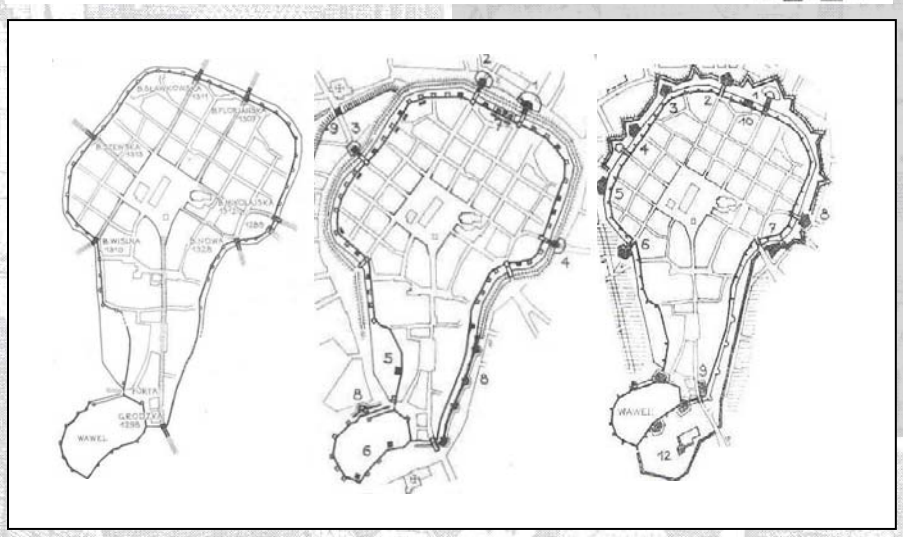
ARKIW experiment (Kraków)

The city of Kraków

The layout of the old town is a result of successive additions and of the evolution of various urban structures :

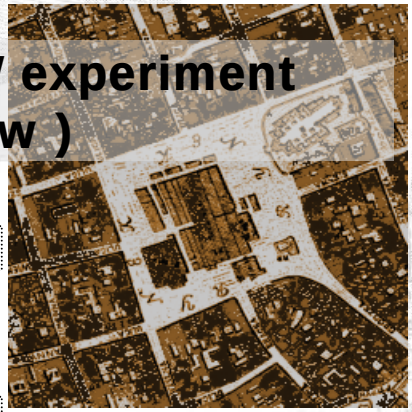
- ensemble of the Wawel Hill
- the suburbium called Okół
- the medieval town (1257).





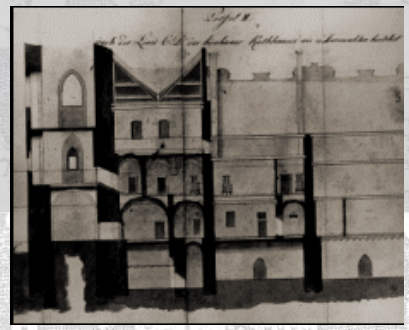
In 1684 forty-seven flanking towers were defending the town Four of them are left (13th-century Florian Gate, Baszta Pasamoników, Baszta Stolarska, Baszta Mieczników). Europe's biggest Barbican (a 15th-century circular-like structure with 3-metre thick brick walls, built in the adjacent to the Florian Gate's propugnaculum) and two arsenals.

ARKIW experiment (Kraków)



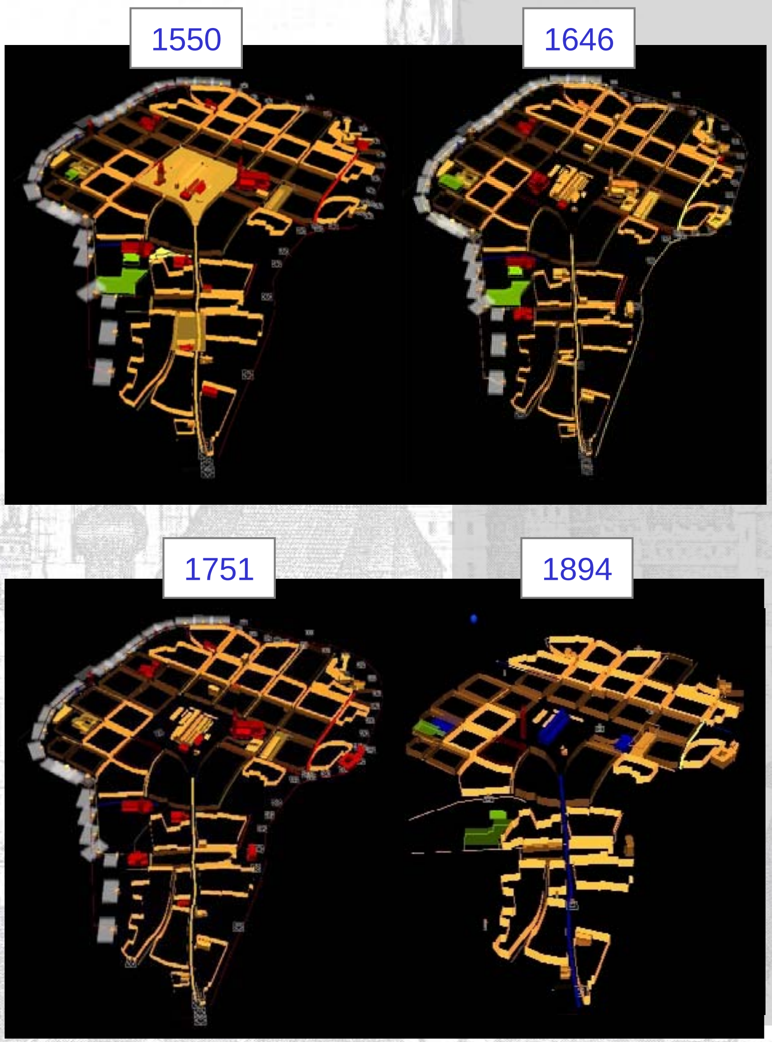
Unlike in the theatres experiment, we deal with :
-a mass of heterogeneous documents,
-a variety of “architectural types”.

The idea: developing tools & method to support the architectural analysis step [documents, observations, etc..] and to make this analysis a “sustainable” one.



ARKIW experiment (Kraków)

An investigation on edifices at various scales:



- 817 evolution descriptions corresponding to 335 architectural objects,
- 761 resources,
- approximately 4650 default 2D and 3D scenes

The development of tools and formalisms to handle the above mentioned investigation, using standards for the web (XML/XSLT/VRML/SVG):

- VIA architectural object descriptions
- SOL Bibliography and iconography database

ARKIW experiment (Kraków)

2D and 3D Graphics are produced dynamically at query time.

Model
set of concepts
(classes)

RDBMS

Instances

Documentation

Ressource itself

Qualitative properties

Identity
(name(s))

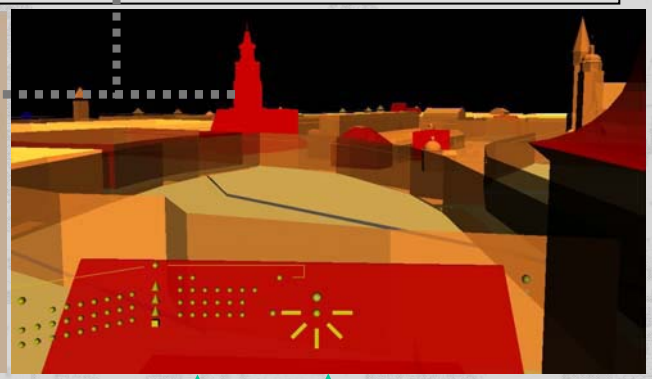
Localisation
(pos/orient)

Evolution
(dates relevant for the object at the time chosen)

Typology
(qualitative analysis)

Documentation
(controls behaviours of each object in the scene)

Morphology



```
version="1.0" encoding="utf-8"?>
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eationDate value="20021612"/>
rigin>
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gency>MAP-ARKIW TEAM- PICS 1150</Agency
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/eta>
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```
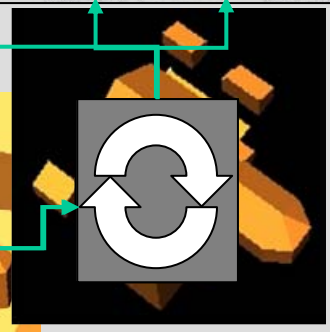

XML



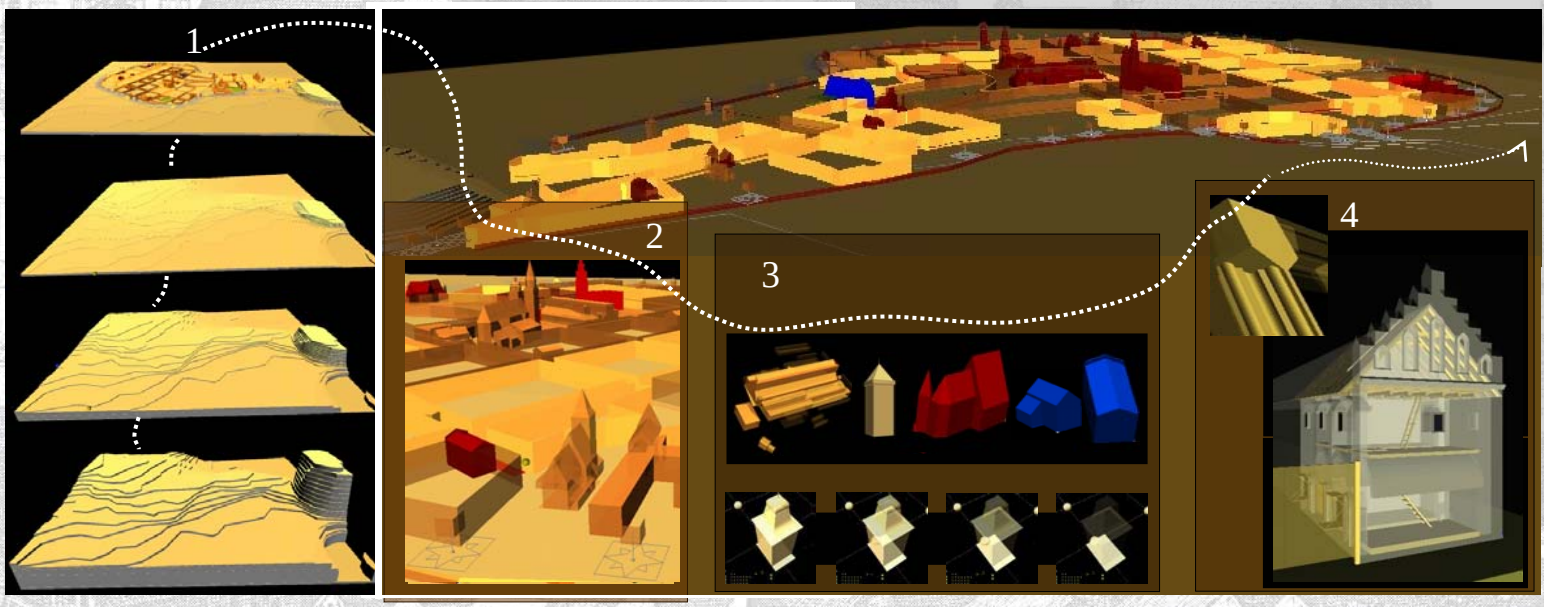
ARKIW experiment (Kraków)

Elements of an information system:

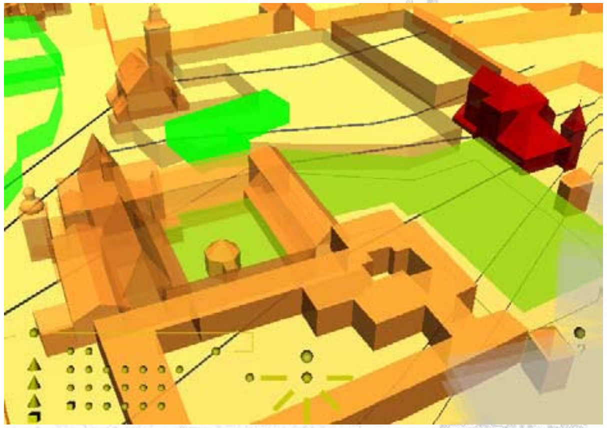
-that uses the morphology of edifices as a mean to localise information in time and in space

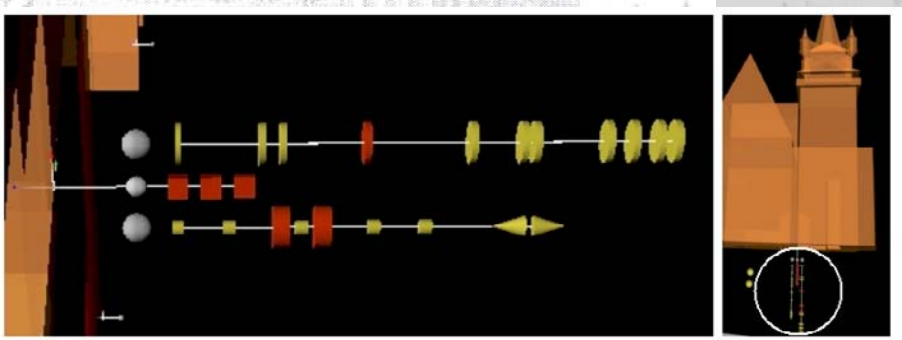
-that uses representations in 2D/3D of the above mentioned morphology for information visualisation and retrieval, with respect to uncertainty issues.

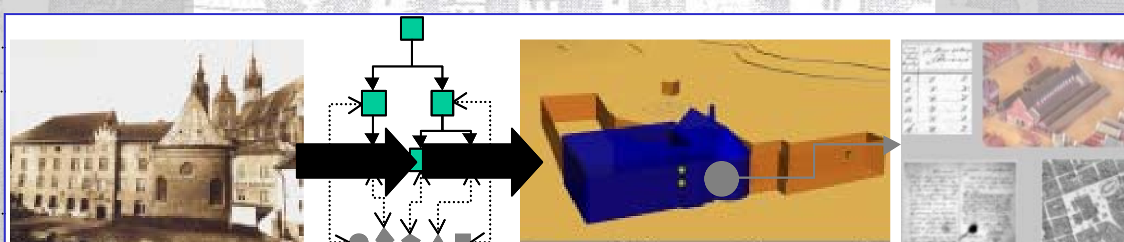
An overview of the dynamic graphics we have produced over time, in terms of type and use.



ARKIW experiment (Kraków) >3D







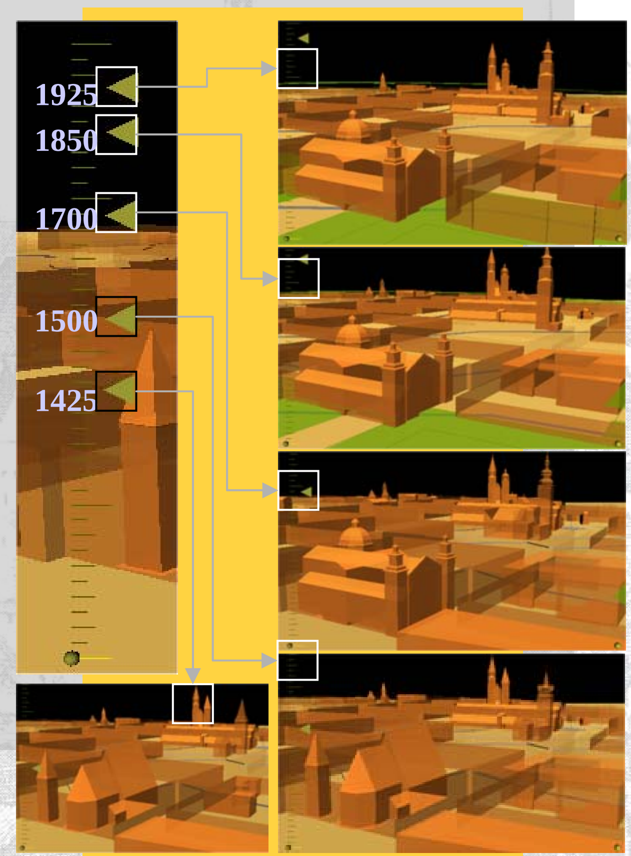
- **Colours & disposals for analysis**

typically, graphic answer to a question like "*documentation for objects of type UrbanEdifice, UrbanBlock and Fortification Units for period 1790-1791*".

- **Interactive timelines**

typically, graphic answer to a question like "*evolution of objects of type UrbanEdifice, UrbanBlock* , ..."

- **Document 's architectural content**



ARKIW experiment (Kraków) >2D

- **Colours & disposals for analysis**

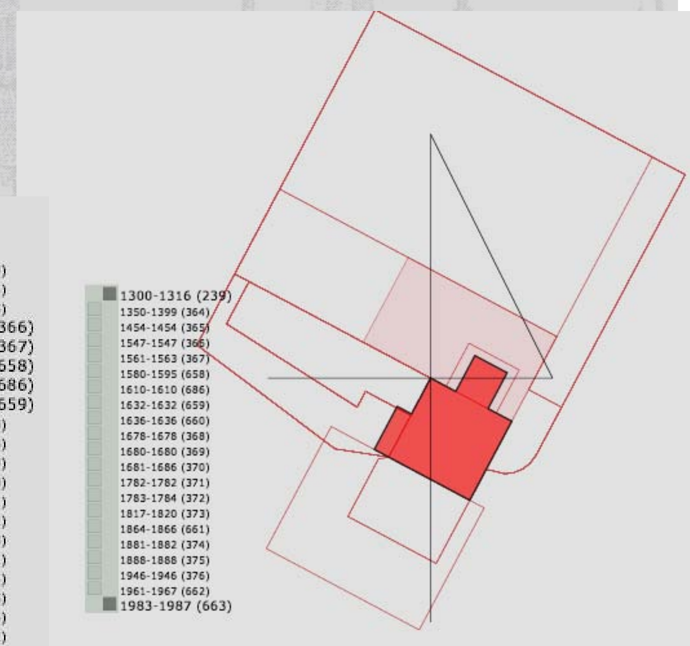
typically, graphic answer to a question like:

“documentation for objects of type UrbanEdifice, UrbanBlock, Fortification Units, Streets and Squares, GreenAreas for period 1820-1821”

- **Interactive time layers**

typically, graphic answer to a question like:

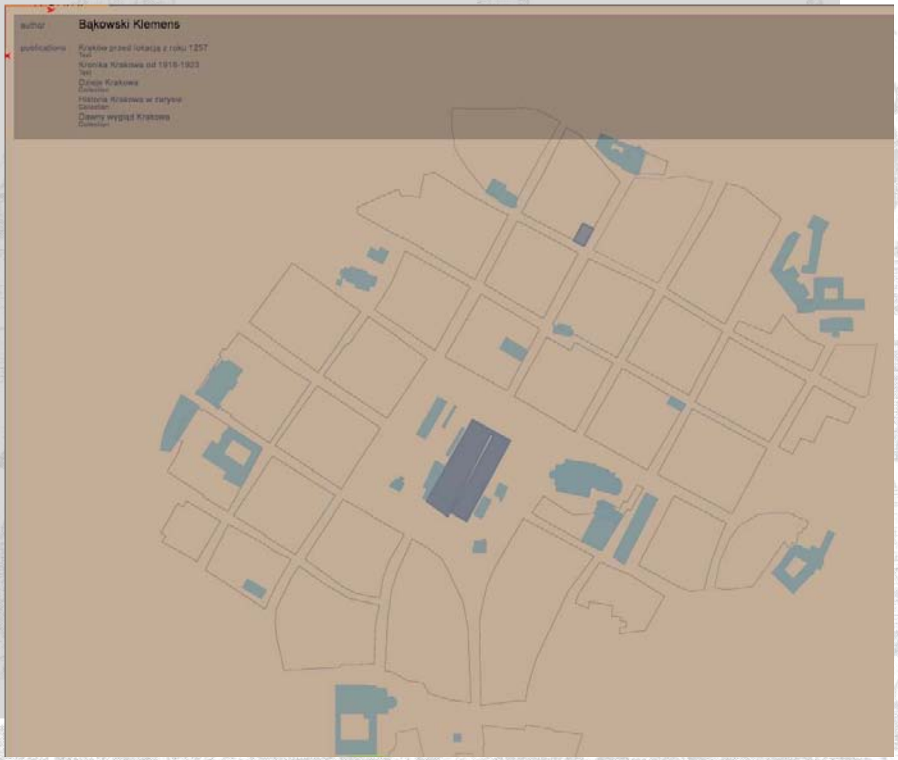
“all objects around object town hall of type urbanEdifice in a circle of 200 meters”



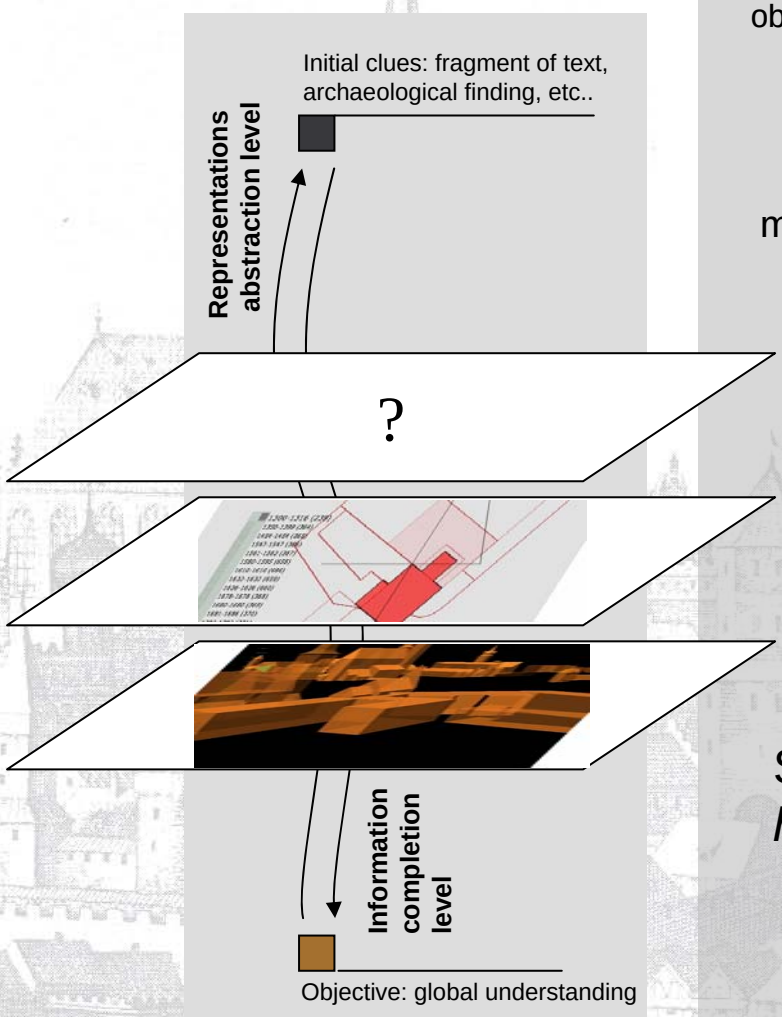
ARKIW experiment (Kraków)

• The visualisation step

Visualising for an author/ a source a "spatial pattern"



ARKIW experiment (Kraków)



Our *view* of
the architectural object

- The visualisation step

"Going abstract" in order to handle poorly known objects, or objects in early stages of the investigation

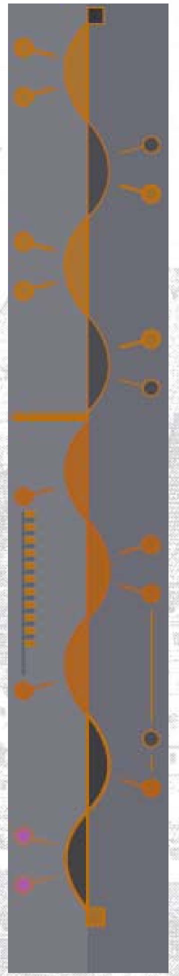
Our state of knowledge, in the early phases of research, may not allow us to provide a 2D/3D morphology that would bear indications on what we know about the object we study.

In other words, what graphics can we provide when we do not yet know what an object could be?

We face the challenge to provide a more abstract representation of the object .

State that : "*something existed round here"* and represent it by a formalism around which one can organise findings.

ARKIW experiment (Kraków)



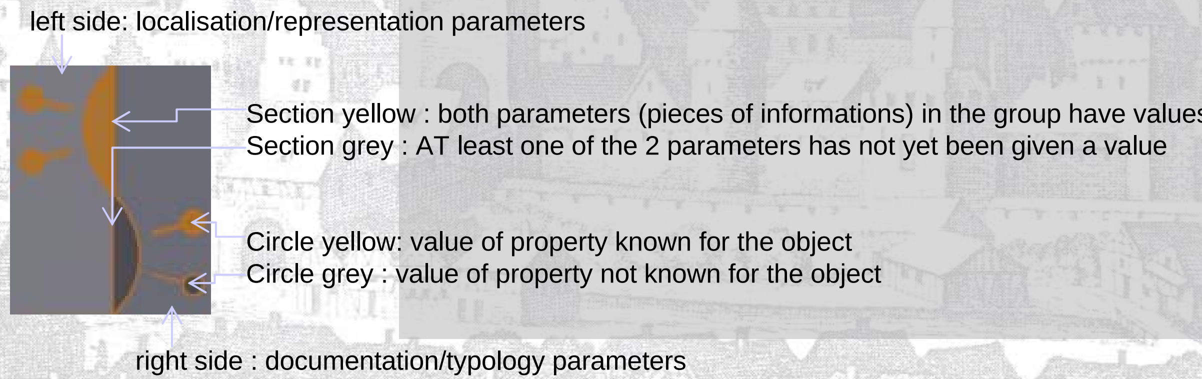
- An information integration formalism

Provide a visual tool that would help us **visualise and share** the « where we are in the research process » information.

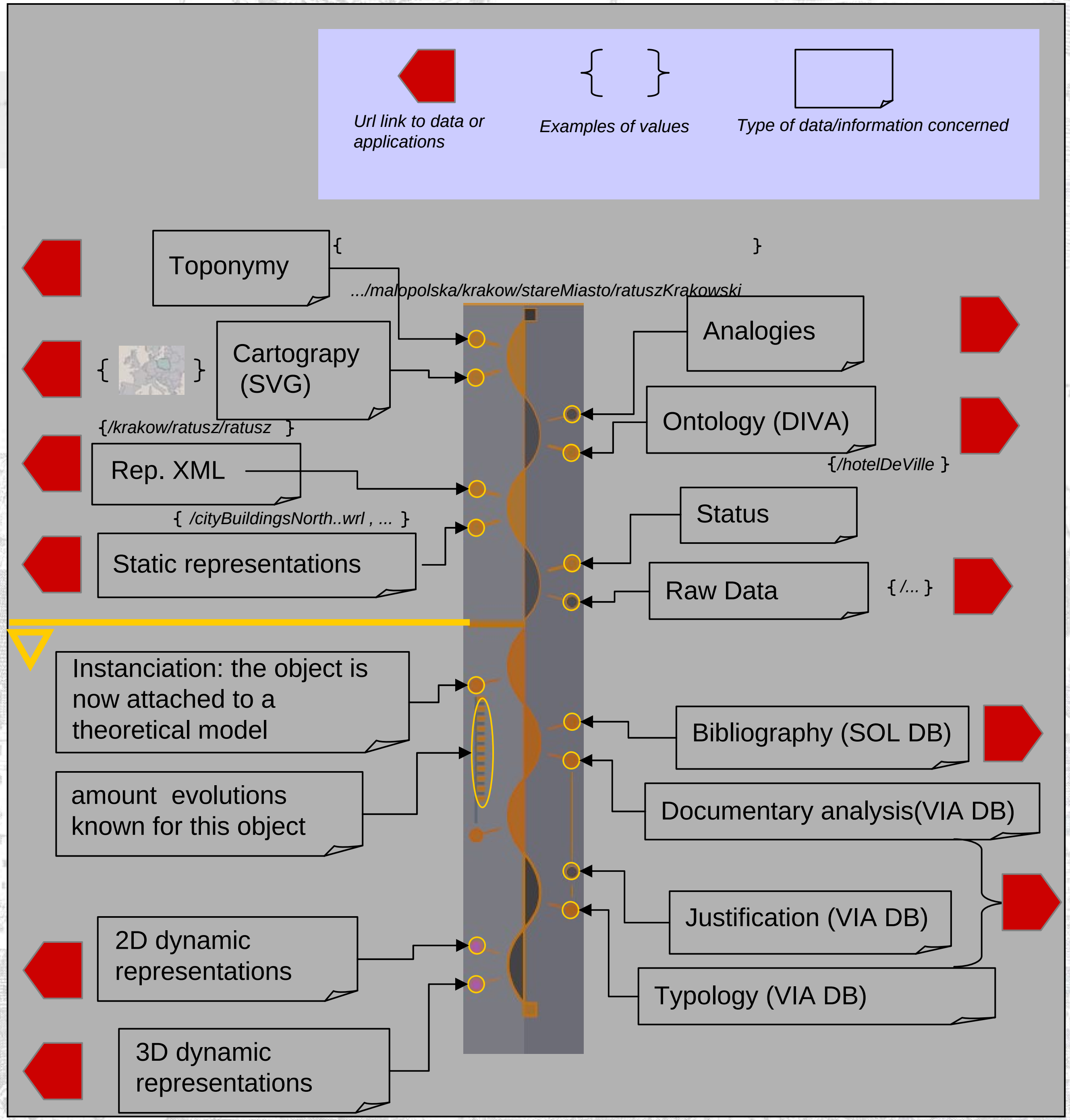
Two constraints:

Integrate all data and information in a common information acquisition model.

Provide autonomy for data/information integration since phases of study are not necessarily correlated in time.

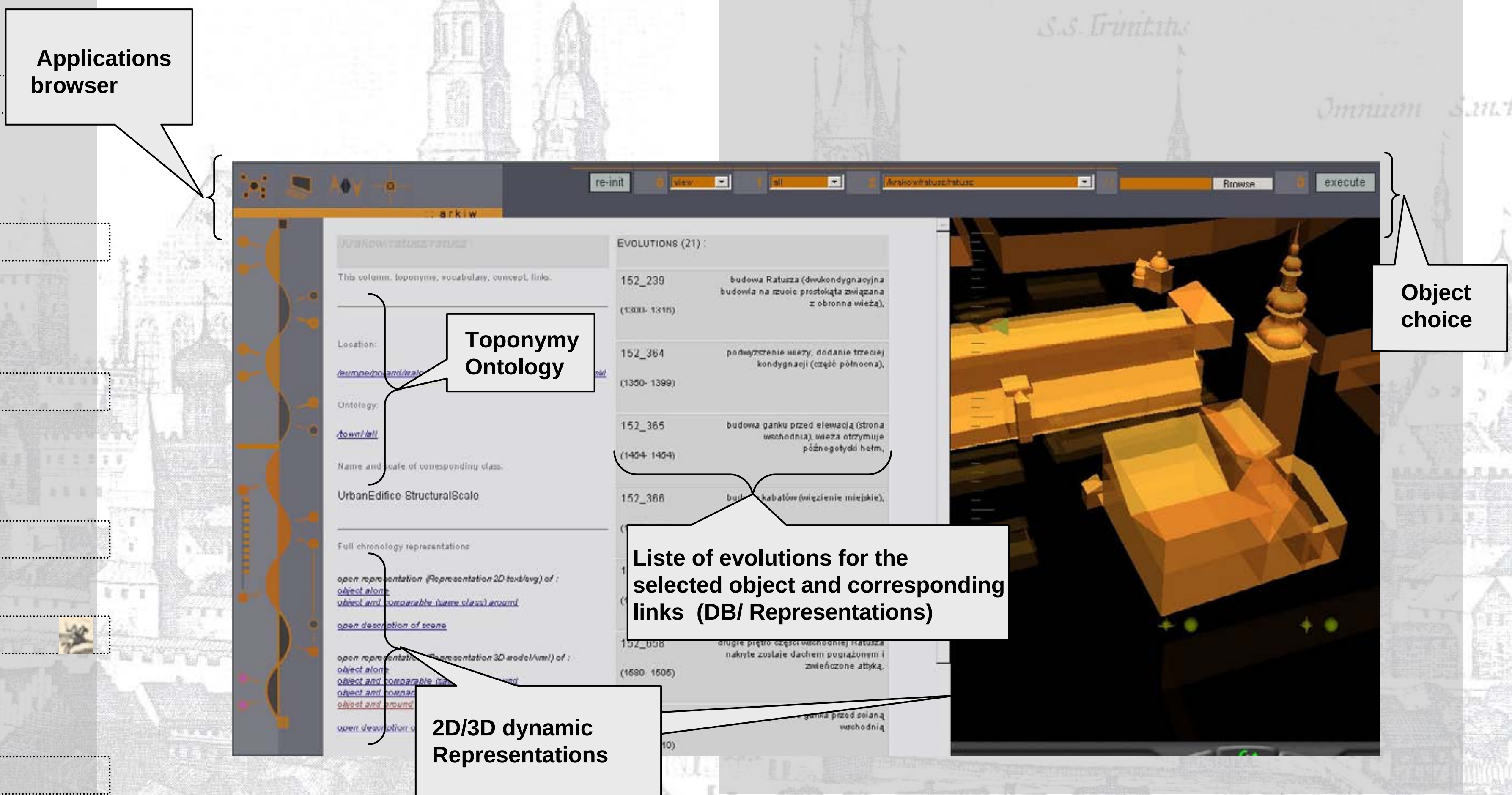


ARKIW experiment (Kraków)



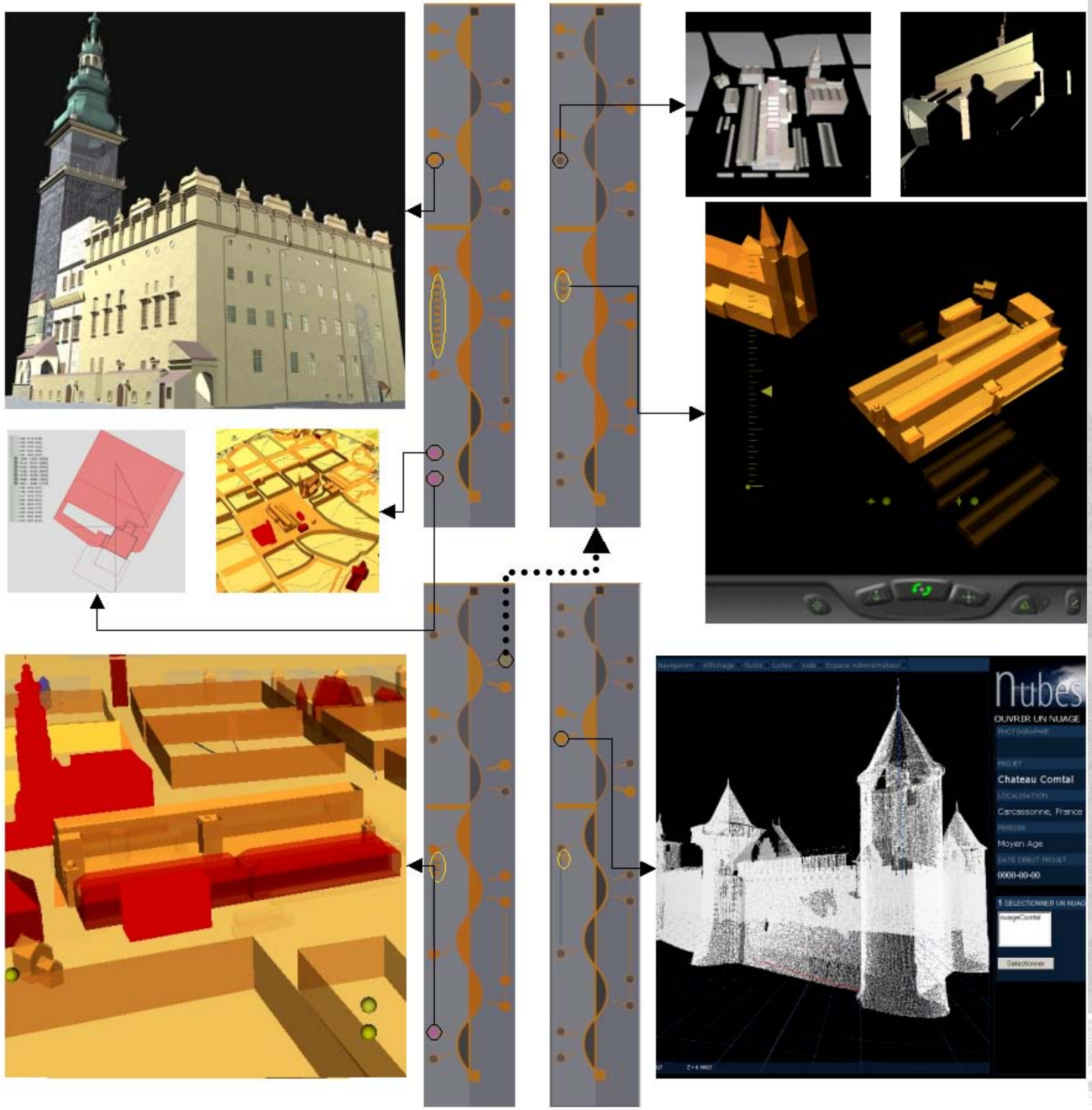
ARKIW experiment (Kraków)

Use of the figure as of a navigation tool



ARKIW experiment (Kraków)

Use of the figure for comparison purposes



3D survey thanks to Livio De Luca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Final remarks [14 rules+1]

Ideas behind our approach, and examples of application

informative modelling as a possible bridge between architectural representation, with a tradition of figuration, and information visualisation

A grid of 14 rules (+1)
as a materialisation of the approach,
acting as guidelines during the investigation

Final remarks [14 rules+1]

Ideas behind our approach, and examples of application

informative modelling as a possible bridge between architectural representation, with a tradition of figuration, and information visualisation

A grid of 14 rules (+1) as a materialisation of the approach, acting as guidelines during the investigation

Four families of rules corresponding to four key aspects of the investigation

Information

- Each piece of information about the object will be interpreted in order to distribute information among semantic layers called informative scales.
- The representation of an object will allow the user to retrieve data and information that justify the presence of the object at the time and date the representation shows.
- The shape given to the object will stem from an interpretation of the data, stating the shape's credibility and making it visible.
- For each object, the representation will show what we know that we ignore, and will not contain unfounded affirmations that would not be justified by relevant data.

Final remarks [14 rules+1]

Modelling

- A theoretical model will describe architectural shapes in a structured way.
- Objects represented inside 2D/3D models will be instances of the above-mentioned theoretical model.
- The theoretical model's implementation will allow the reuse, the comparison and the sustainability of the information on the instances.
- Each concept of the theoretical model will be attached to a given informative scale.

Ideas behind our approach, and examples of application

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Four families of rules
corresponding to four key
aspects of the investigation

Final remarks [14 rules+1]

Representation

- 2D/3D model will be the visual answer, displayed thanks to the representation of architectural objects, to a query about our state of knowledge.
- 2D/3D models will be calculated in real time so as to reflect our current state of knowledge at query time.
- The appearance given to an object will use a set of graphic codes that should be developed in order to visualise the object's underlying information.

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Four families of rules corresponding to four key aspects of the investigation

Abstraction

- The object will be displayed inside 2D/3D models with alternative levels of abstraction depending on both/either the scale and the level of knowledge reached in the investigation process.
- The investigation process will be implemented as a non-ordered process allowing the integration of disjoint sets of information.
- The level of knowledge reached in the investigation process on a given object will be represented in real time inside 2D/3D models.

Final remarks [14 rules+1]

Ideas behind our approach, and examples of application

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Four families of rules corresponding to four key aspects of the investigation

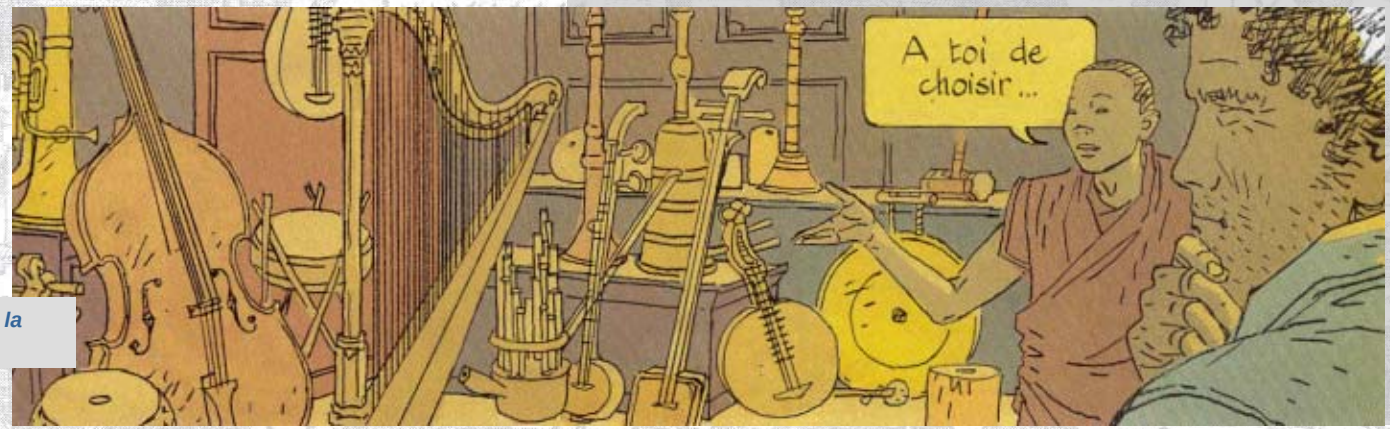
¿ If a 2D/3D model does not produce a gain of insight into the underlying information - it should be considered worthless.

Final remarks [14 rules+1]

Rules ?

graphics = alternatives

a graphic = a choice that should mostly depend on what I expect to learn



Cosey, Celui qui mène les fleuves à la mer, Éditions Le Lombard, 1997

Final remarks [14 rules+1]

An approach at an intersection of disciplines and practices.

The result of interdisciplinary influences

Current focus (among other) : further evaluate the usability of the rules through practical case studies, further investigate the usability of graphics in the field of the architectural heritage

Time, Space and the dynamics of change in archaeology
ISA Network Thematic summer school, Tours, 2007

on infovis aspects:
Visualisation summit
< www.ia.arch.ethz.ch/summit.htm >

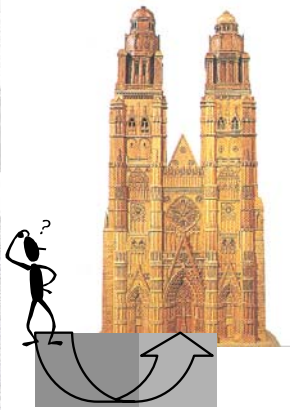
a forum to share ideas and experiences
MIA on-line Journal
<http://www.map.archi.fr/mia/journal>

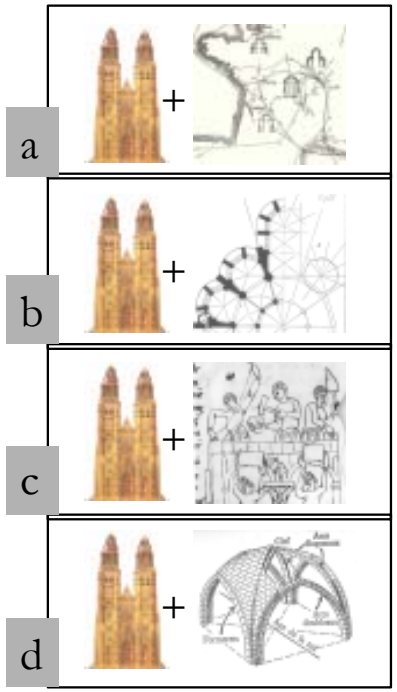
Final remarks [14 rules+1]

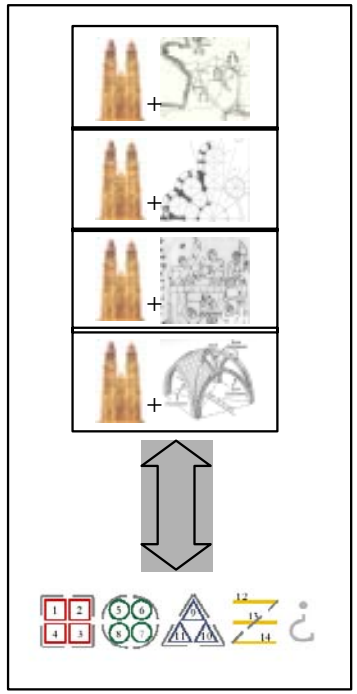
Afternoon Workshop:

13:30 - 14:30
Free visit of the cathedral,
with an A4 document to fill in

14:30 - Meeting in room C0030







1 — 13:30-15:30 — 2

3 — 16:00-17:00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STOP!..