

# HANDLING CHANGES THROUGH DIAGRAMS.

Frame, Grain and Scale in visualizing  
Complex System.

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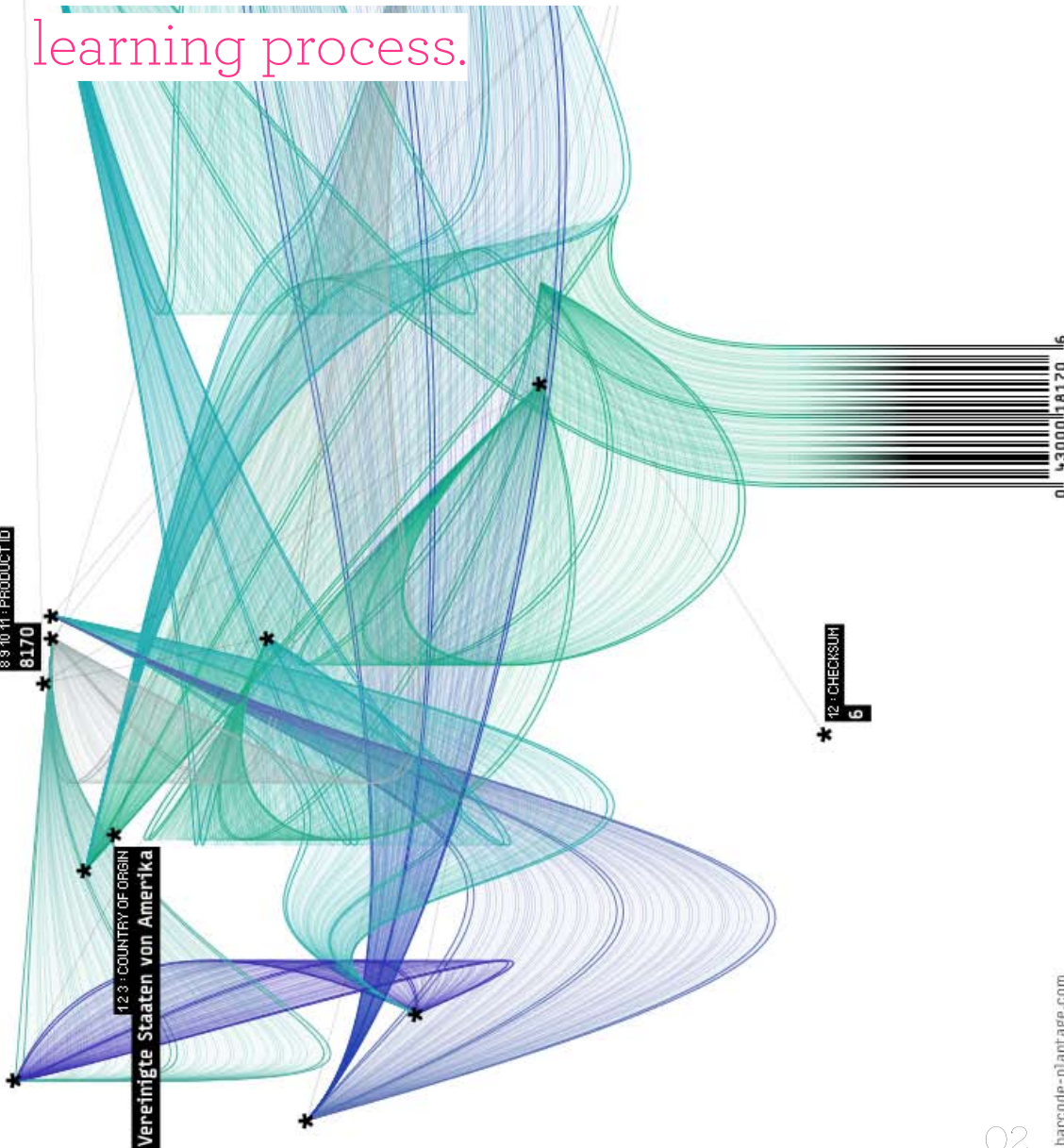
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INDACO Department, D.com Research Unit - Ph.D. Candidate

# Handling changes in a sustainable perspective.

Time constraints & collaborative  
learning process.



An increasing regard in **system thinking** and **Complexity**.

The **complexity** of **sustainable development**.

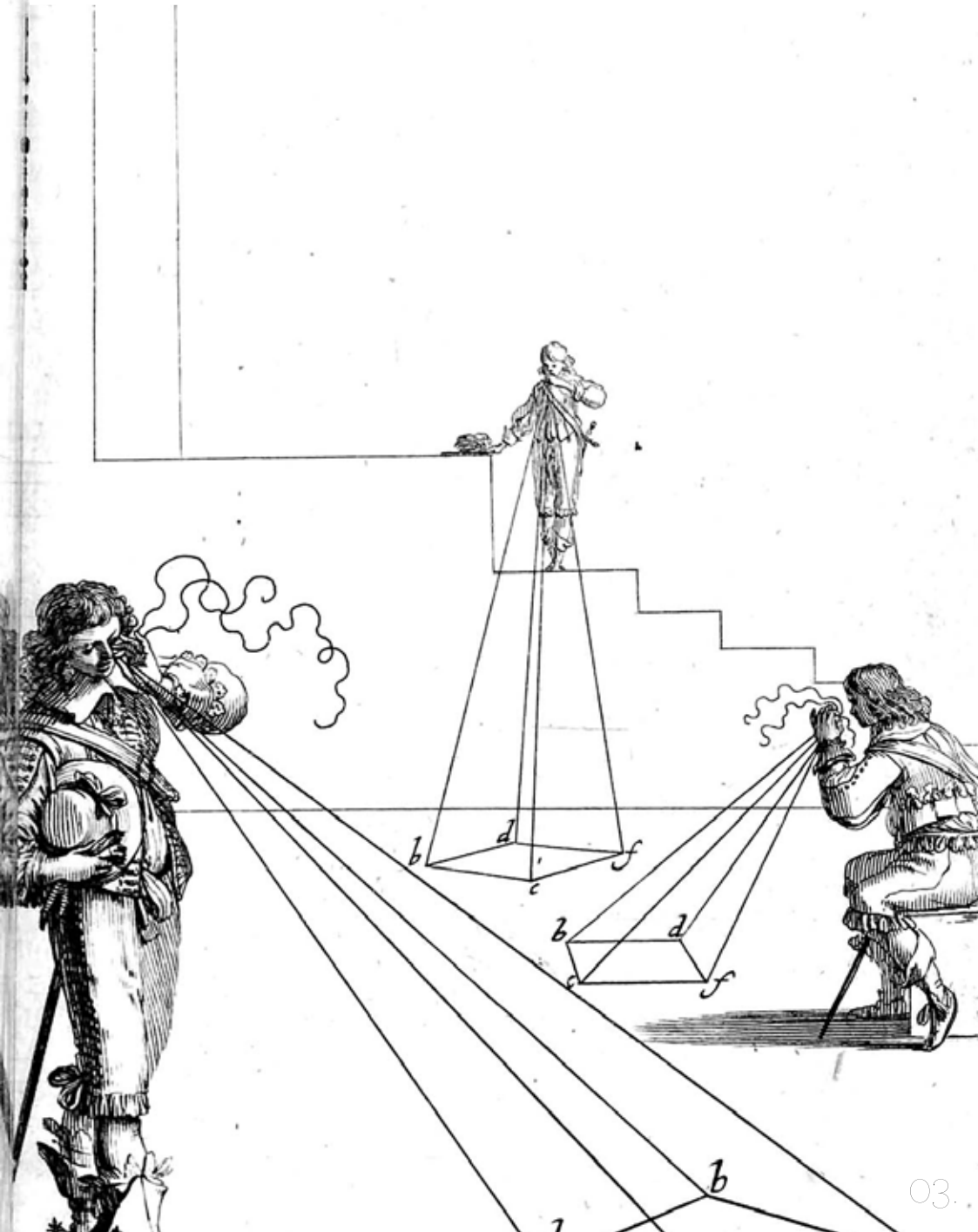
Complex systems as  
**LEARNING ORGANIZATIONS**.

Sustainable development as  
**LEARNING PROCESS**.

To cope with **DENSE** situations and the  
complexity of  
**COLLABORATIVE LEARNING  
PROCESS**.

# Design for Complexity.

A crude look at the whole.



The designers task is to **select results** from heterogeneous disciplinary fields activating a trans-disciplinary **circulation of concepts.**

Designer's key competences:

- \* To see - understand frameworks;
- \* **To SHOW - visualize information;**
- \* To fore-see - anticipate critically.



# To visualize.

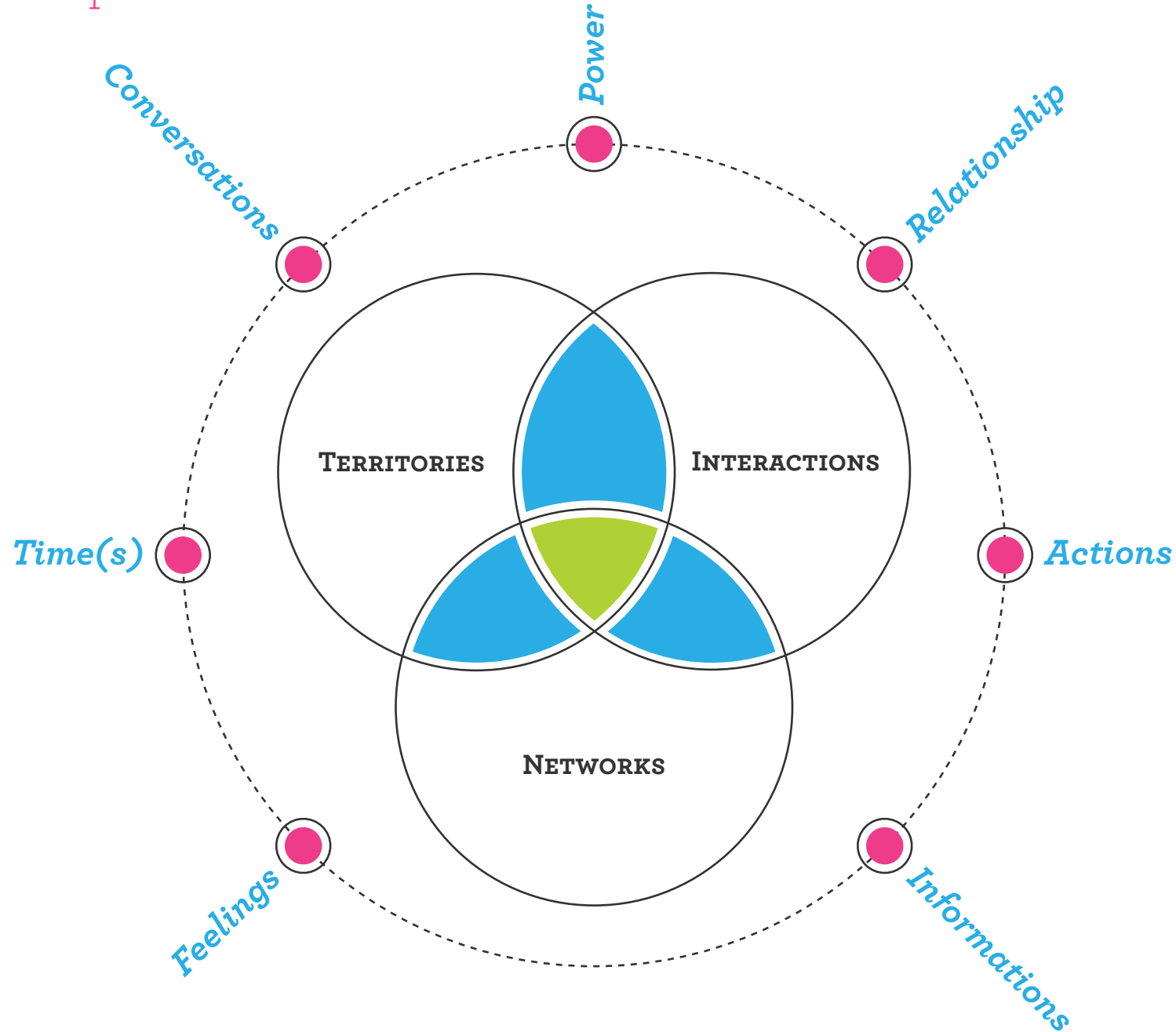
Making the complex accessible.



The design ability of describing worlds emerges as an answer to **THE NEED OF ORIENTATION.**

# To visualize.

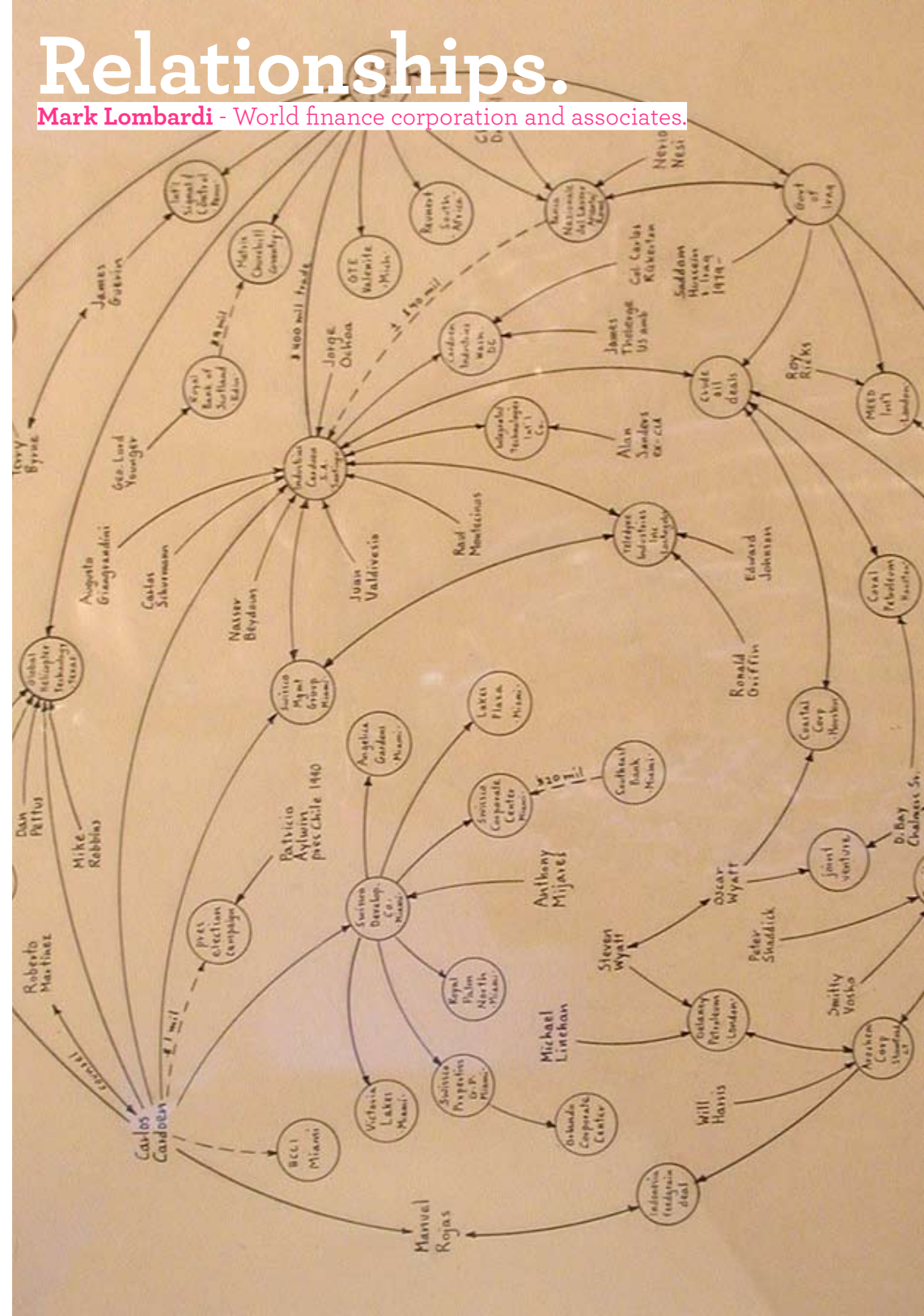
Making the complex accessible.





**They Rule** - [theyrule.net](http://theyrule.net)

**Mark Lombardi** - World finance corporation and associates.





# Feelings.

Judith Donath - [smg.media.mit.edu/projects/loom2/](http://smg.media.mit.edu/projects/loom2/)

# Time(s).

Jim Bumgardner - Time Graphs

6:00 am

noon

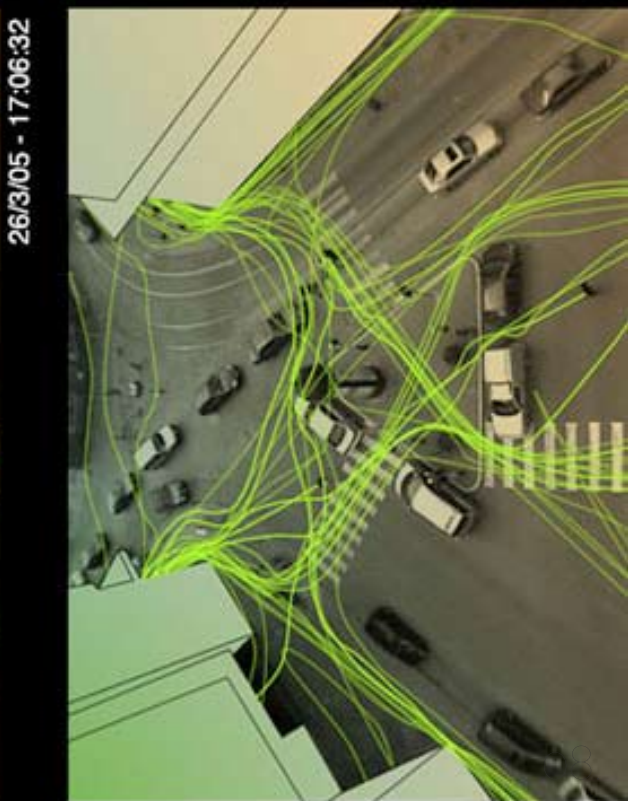
6:00 pm



**Thomas Laureyssens** - [pedestrianlevitation.net](http://pedestrianlevitation.net)



26/3/05 - 17:06:32



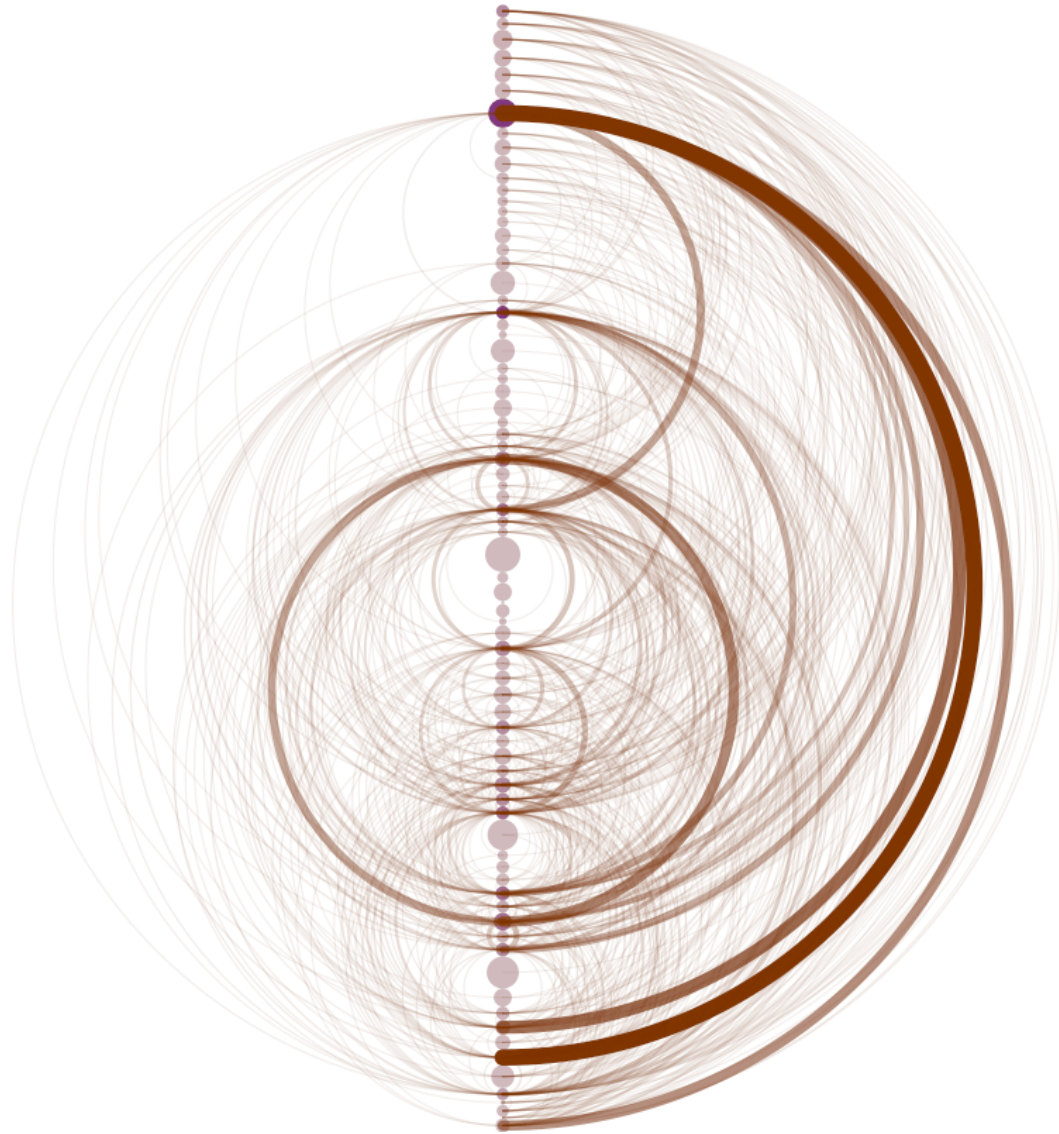
**Marcos Weskamp** - [marumushi.com/apps/newsmap/newsmap.cfm](http://marumushi.com/apps/newsmap/newsmap.cfm)





# Conversations.

Martin Dittus - IRC ARCS



# Density design.

A platform for the spaces of actions.



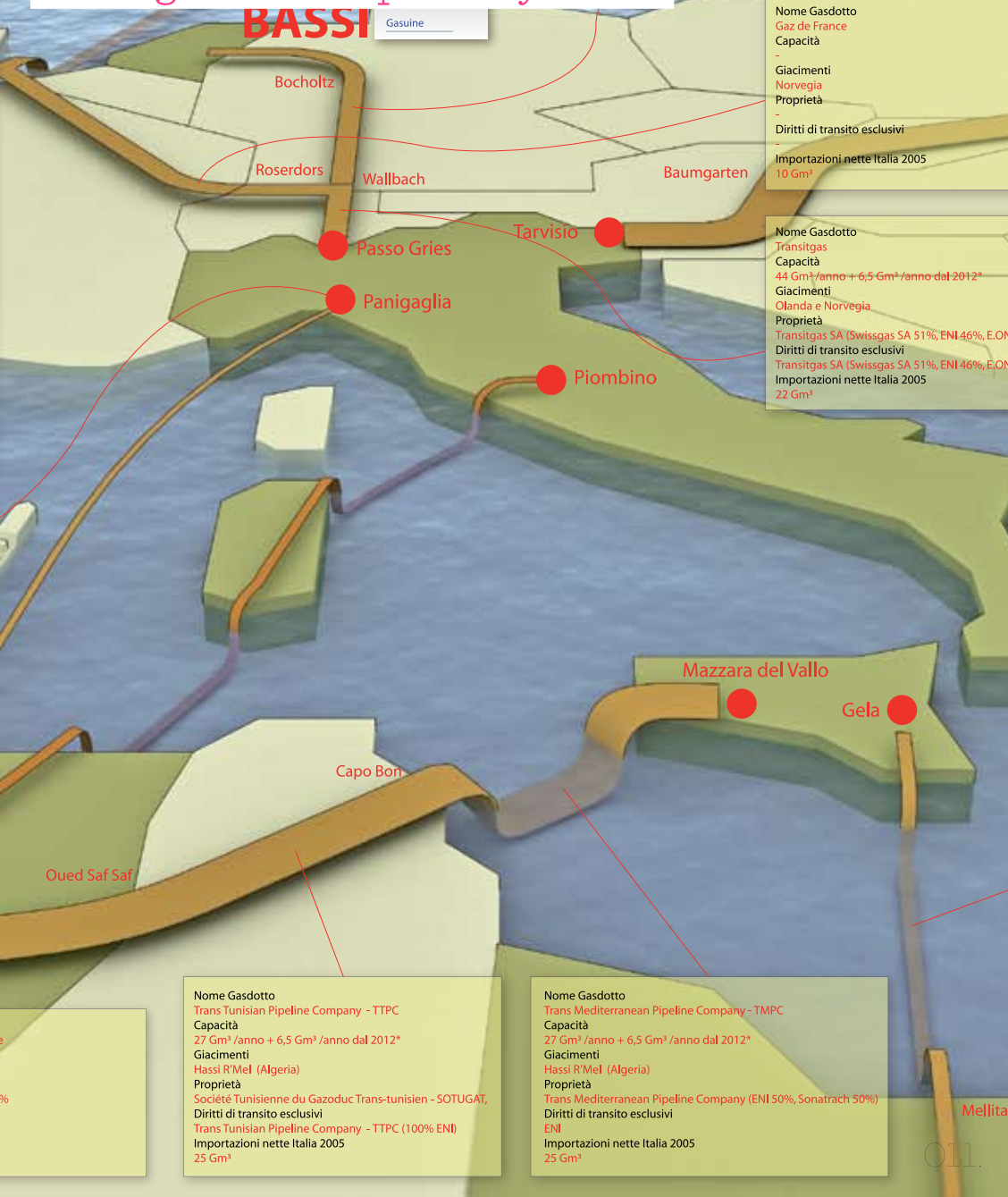
The Complexity science findings,  
combined with researches in  
**information aesthetics.**

**TO EXPLORE** the relationships among  
communication design, information  
visualization and complex systems.



# Diagrams.

Supporting changes in organization  
acting in Complex system.



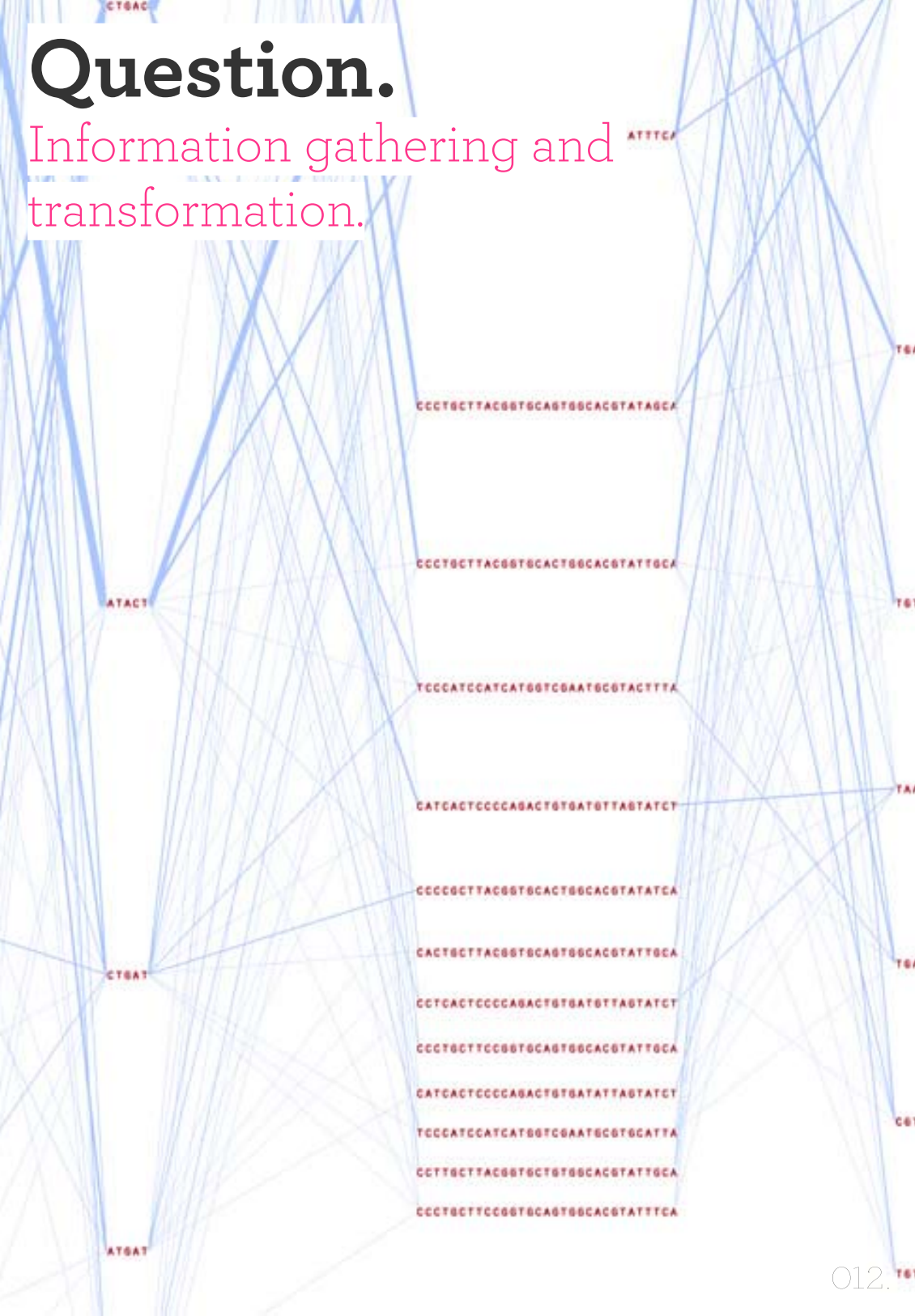
Evolution in **multi-organizational** and **multi-actorial** contexts and complex systems Vs. **analytic logic rules**.

**TO BUILD-UP TOOLS TO SHARE COMMON PERSPECTIVES AND INTENTIONS.**

**DIAGRAMS** are able to cope with the **conversational nature of decision making processes** in social complex systems.

# Question.

Information gathering and transformation.



How could diagrams be created, studied and interpreted **to generate new meta-data** and to find opportunities?

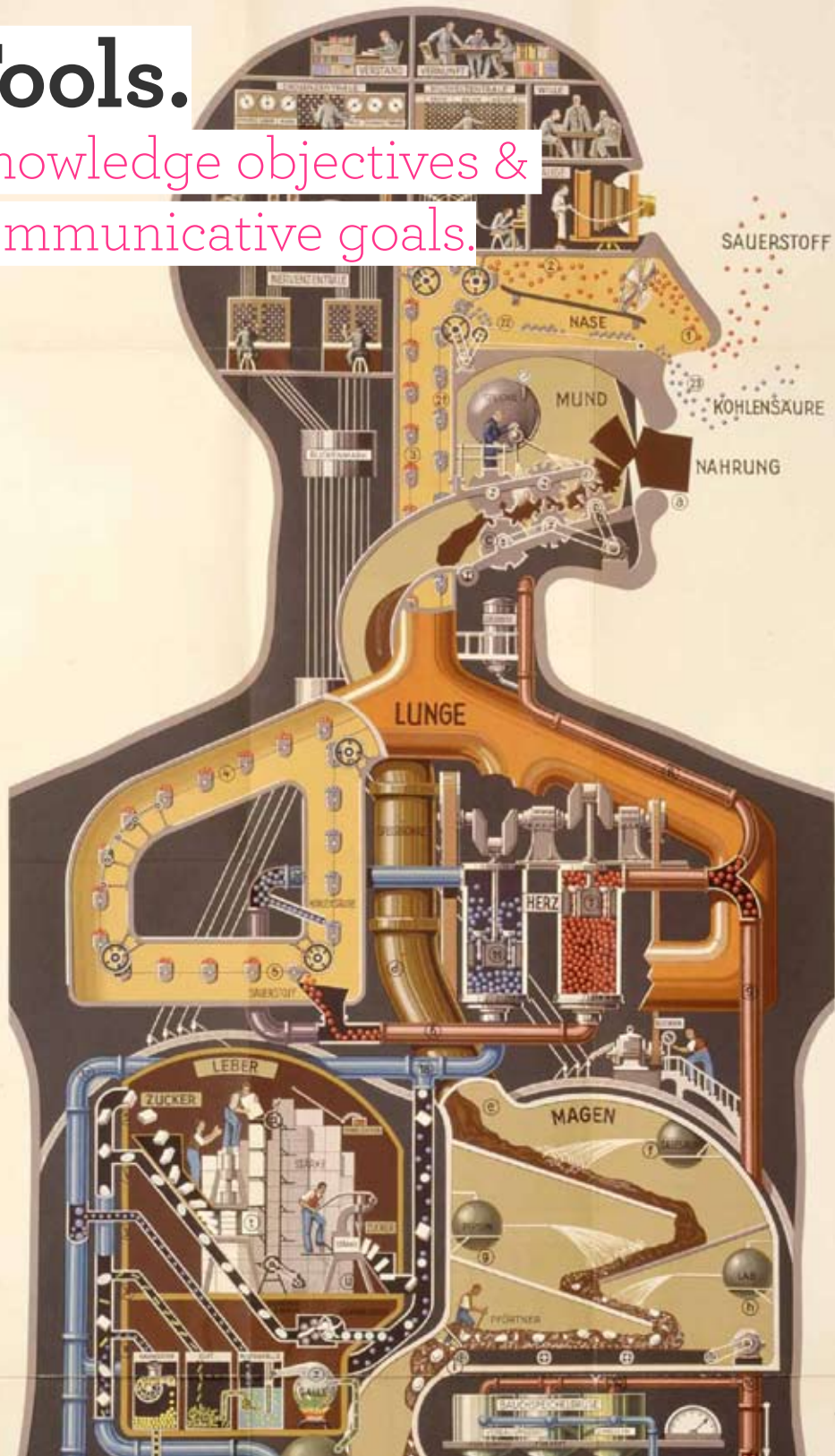
Synthesizing information in a goal-oriented way, **PRODUCING NEW KNOWLEDGE ABOUT THE SYSTEM IN WHICH INTERVENE.**

012. The **RESPONSIBILITY** of design.



# Tools.

Knowledge objectives & communicative goals.



013.

- \* **FRAMING** – the definition of the complex system **extension domain**;
- \* **GRAINING** – the definition of the threshold **accuracy and deepness** of the information;
- \* **SCALING** – the definition of **the viewpoint**.



# Where do we expect starting patterns of interactions change?

Framing & Wideness.

Complex systems are usually **open and interact** with the environment they live in.

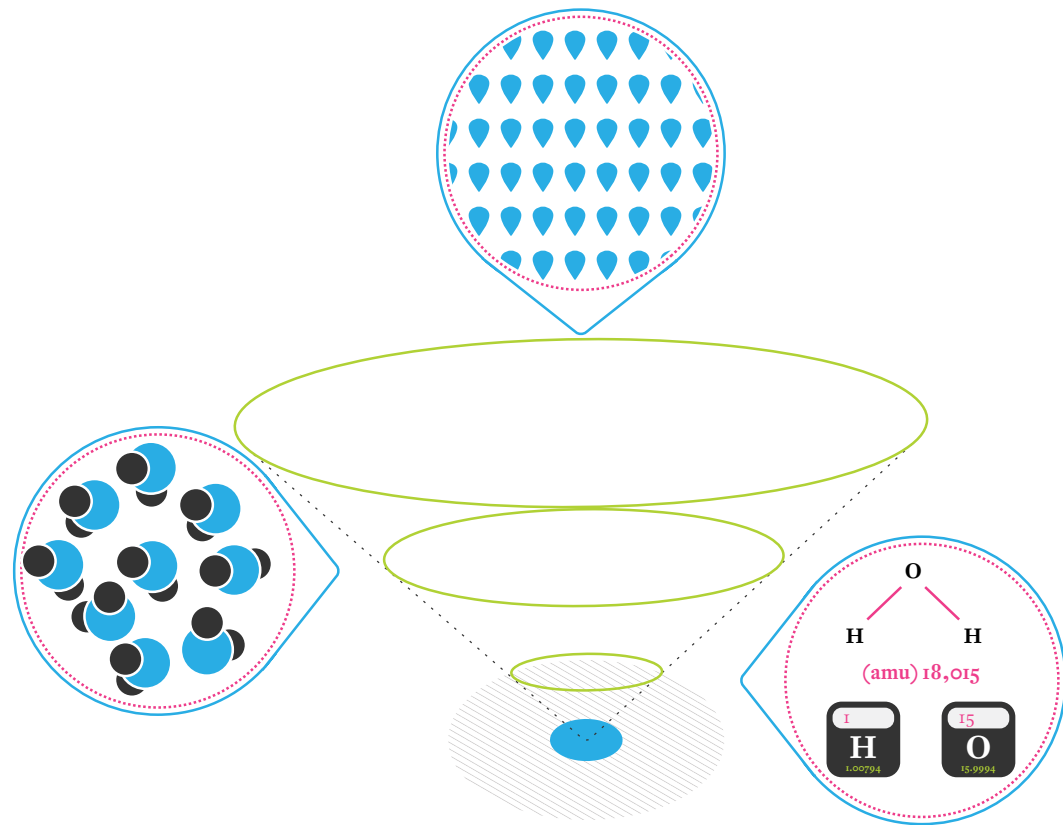
It is difficult to **CLEARLY DEFINE THE SPACE** where information should be gathered.

Framing should be related, also, to the **temporal dimension** of the system.



# Where is it expected to find regularities or irregularities?

Graining & Deepness.

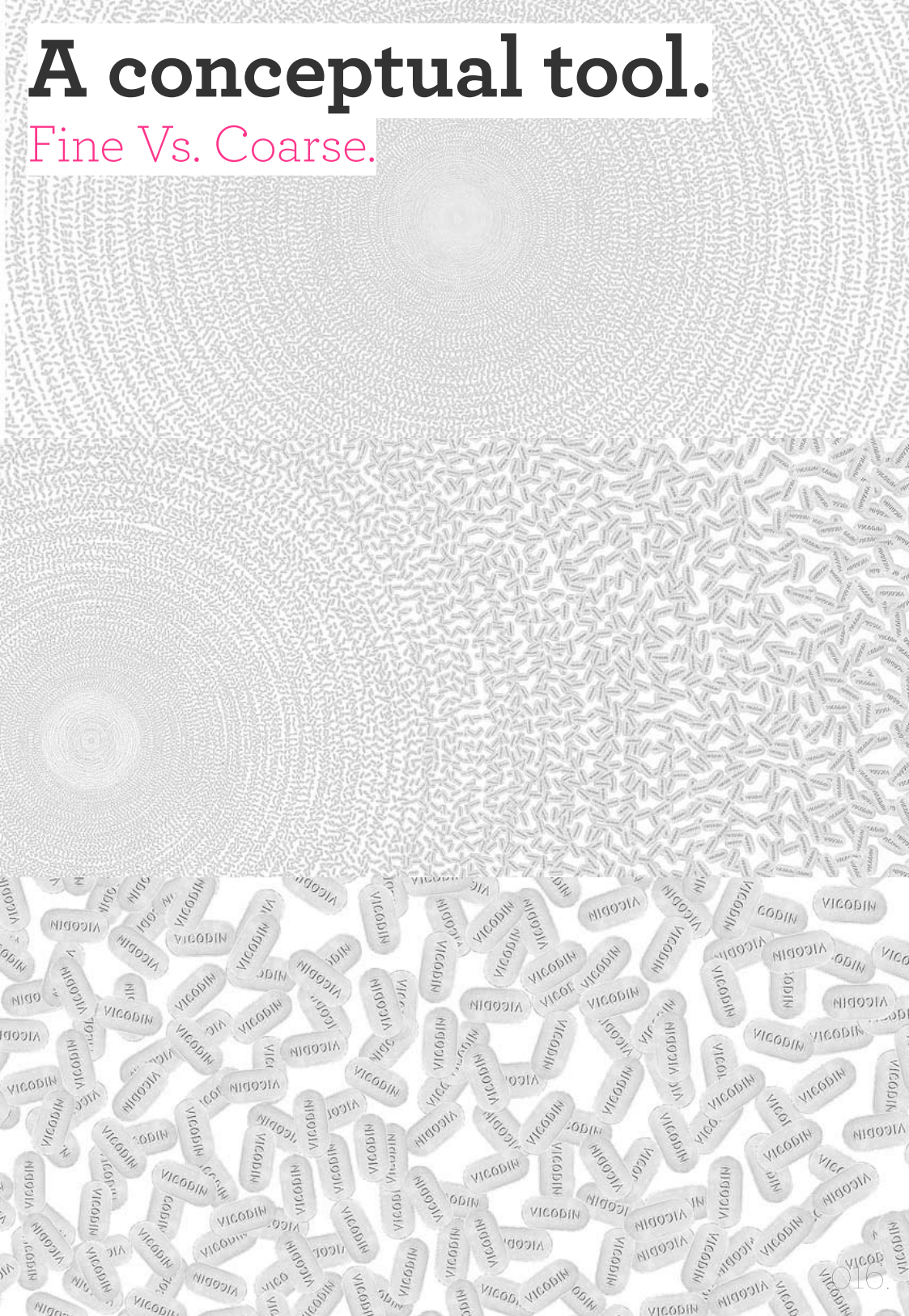


To set a **RESOLUTION LEVEL** is fundamental considering the amount of sensible data much greater than the **available, perceptible and intelligible** one.

015. To avoid the **information overload**.

# A conceptual tool.

Fine Vs. Coarse.



Fine-grained observations, **a near sighted** way to perceive rendering **detailed impressions**.

Coarse-grained observation, **a far sighted** observation rendering **rough impressions**.

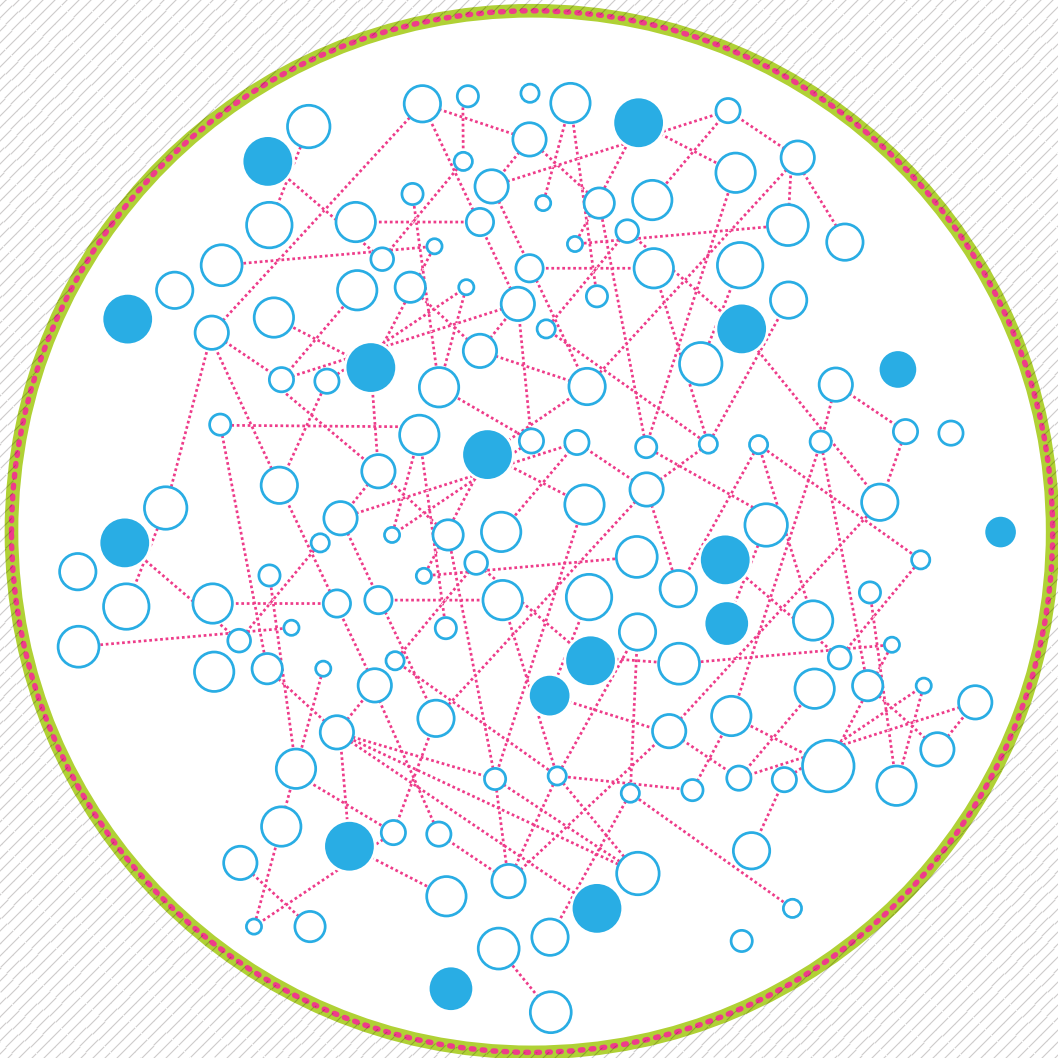
A sort of **THRESHOLD OPERATOR** acting on the data gathering deepness.

The process of graining **narrows** the amount of data should be managed by a diagram.



# What is the scene to be depicted?

Scaling and viewpoint.



A **cartographic** based approach.

It affect the visualization of the system in terms of generalization:

- \* **Amount of details** included
- \* **Simplification and selection.**



# An empirical verification.

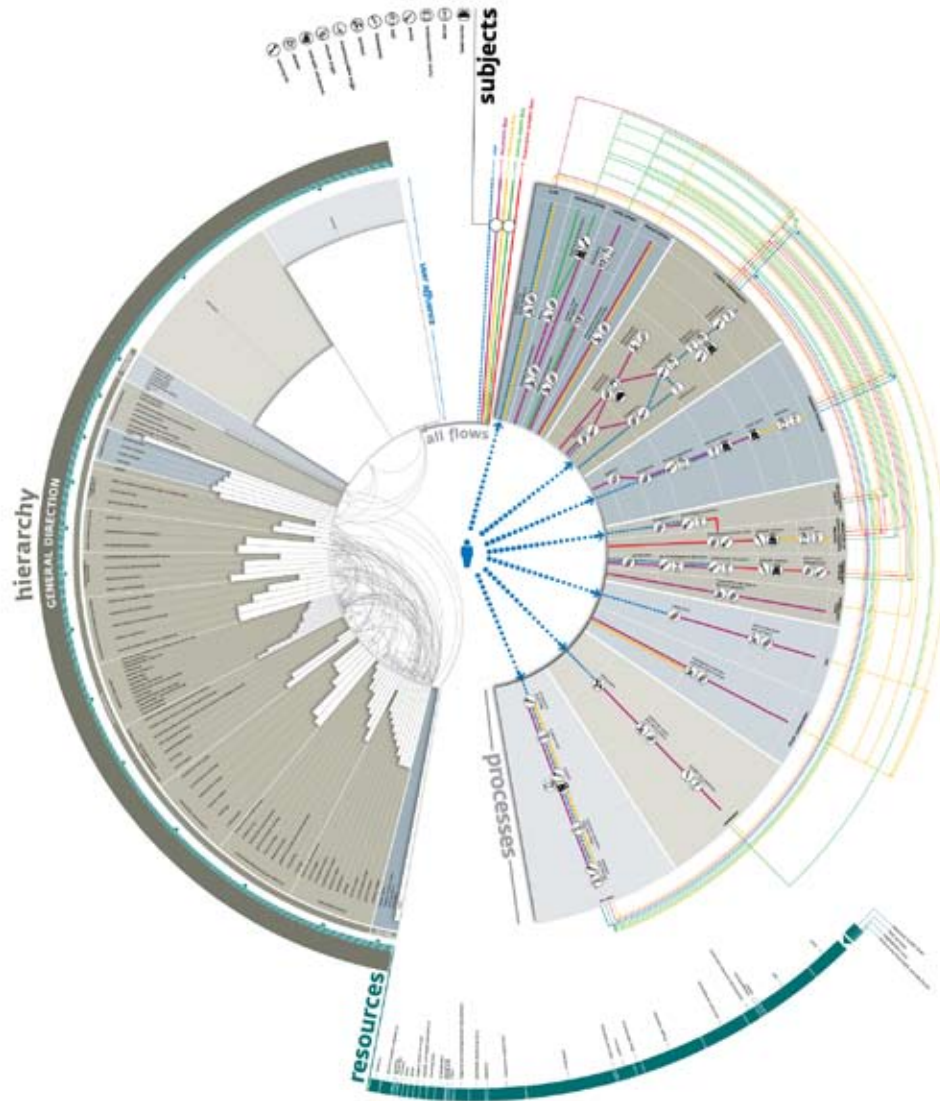
49 students 6 Complex systems.

Exploring **relevant socio-political issues** in order to produce a diagram able to identify some **POSSIBLE EVOLUTIONS** of the system.

- \* the Italian cinematographic system;
- \* the fashion system;
- \* the contemporary art system;
- \* the hospital - patient system;
- \* the Italian transportation infrastructure system;
- \* the Italian media landscape system.



# Framing... and model.



The hospital system framing it to the **physical bound** of an ideal hospital.

Framing seems to be reasonably **ATTUNED TO THE PURPOSE** of the system description.

# Framing...



In general, framing process has been determined by **SPATIAL LIMITS**.



# Framing...

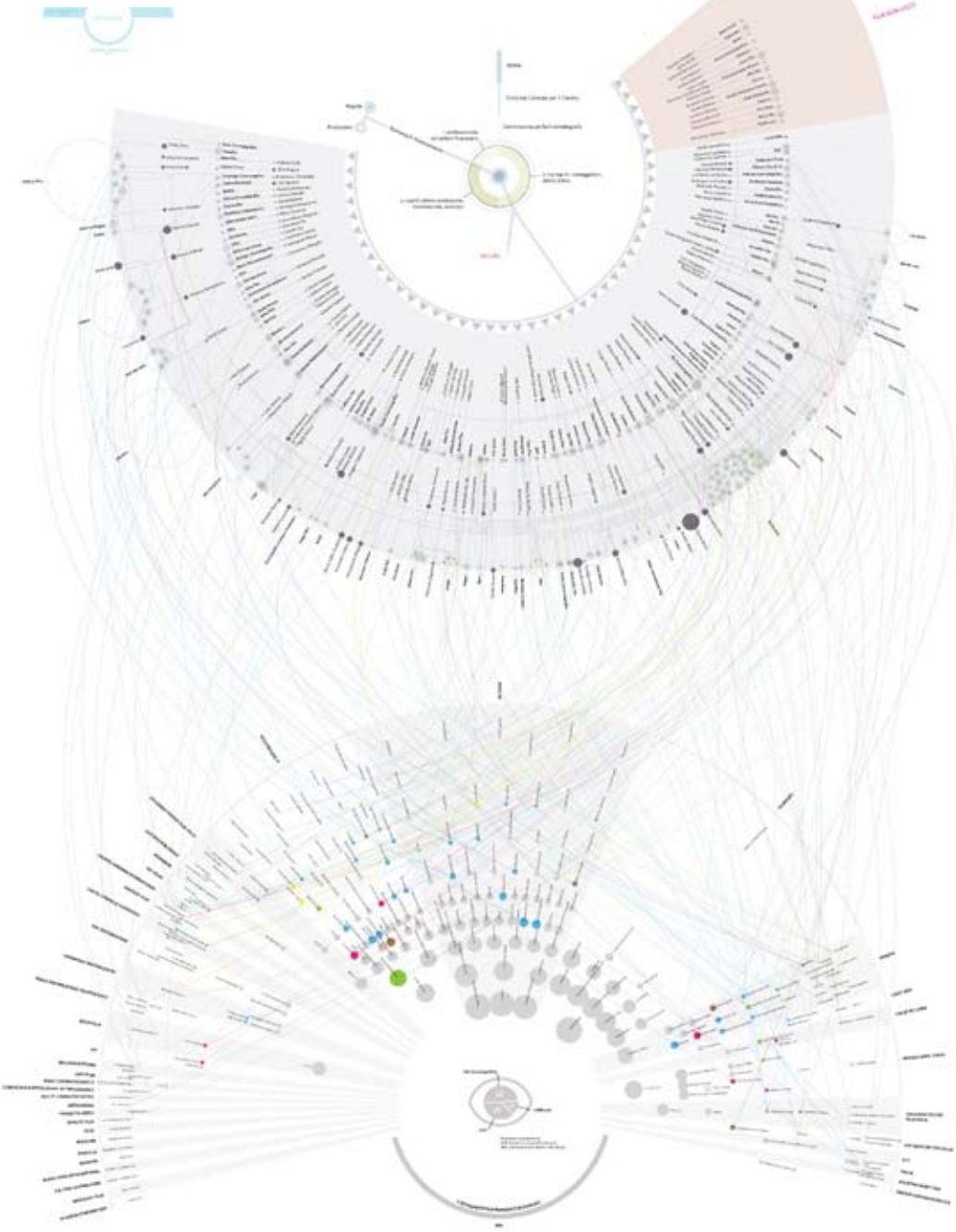
and some considerations.

## Cinema System

The map represents Italian cinema system, focusing on government funds regarding cinema production. Its primary focus on funding process is ordered by the cinema's financial flows as an input and output process. Government supports only cinema regarded as "national interest" principle, with the aim of boosting Italian cinema.

The flow board brings out cinema into a complex system with public and private players, but there is a lack of funding through the system because don't serve successfully to the audience, a flag for the cinema's crisis. Two different sub-system emerge, public and private, comparing for the same output, the audience, into a large network of relationships. Production, distribution and (eventual) promotion governs the process.

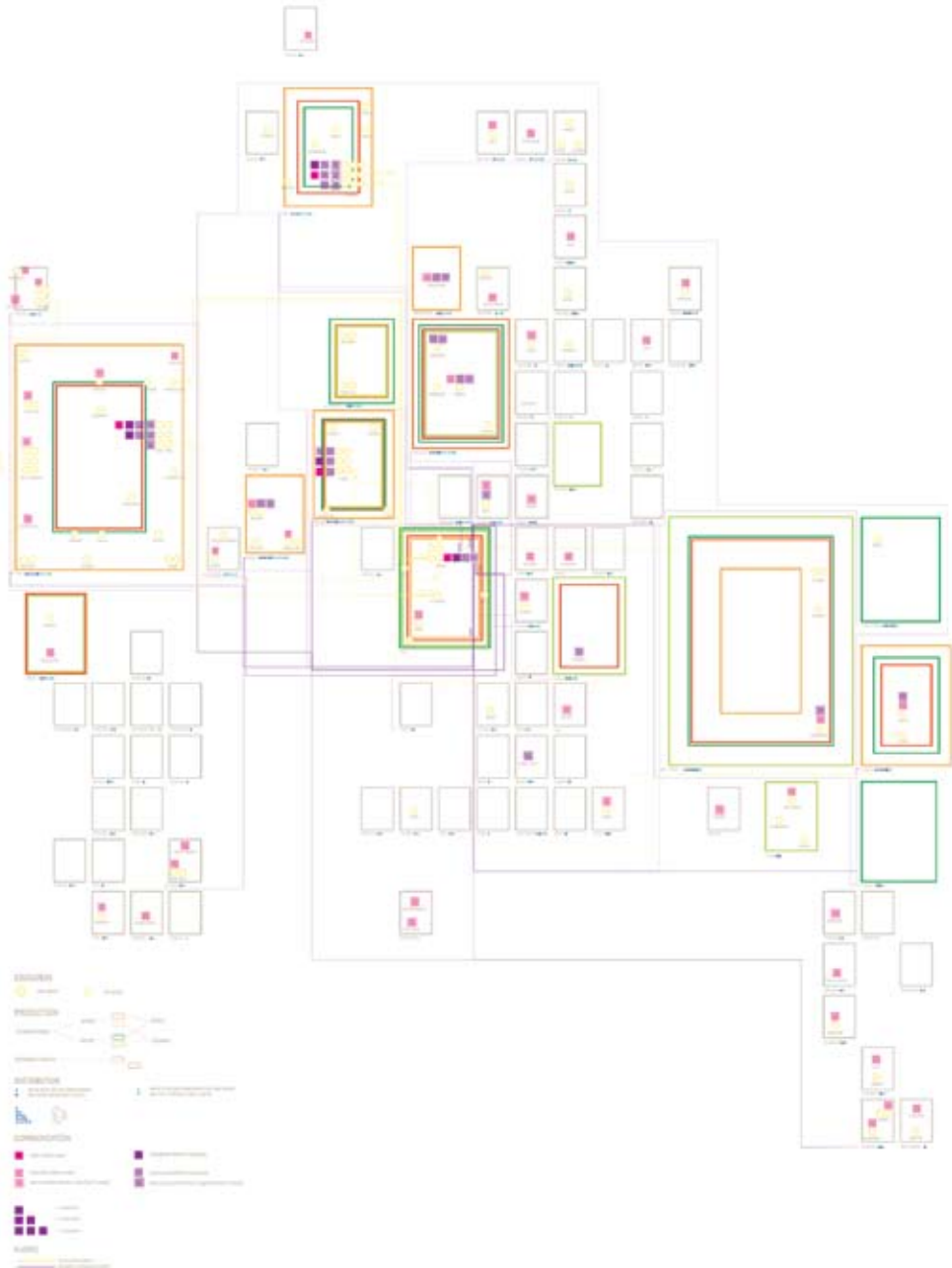
SARA BOLLANANI  
GIUSEPPE DI CARO  
BARBARA CARARA  
FRANCESCO CARALLO  
GIUSEPPE CARALLO  
FRANCESCO CARALLO  
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FRANCESCO CARALLO  
FRANCESCO CARALLO



In cinematographic systems, the frame **should be extended** not only to the production chain.

# Framing...

and some considerations.



The fashion system case introduced **time variable** into framing process.



# Framing...

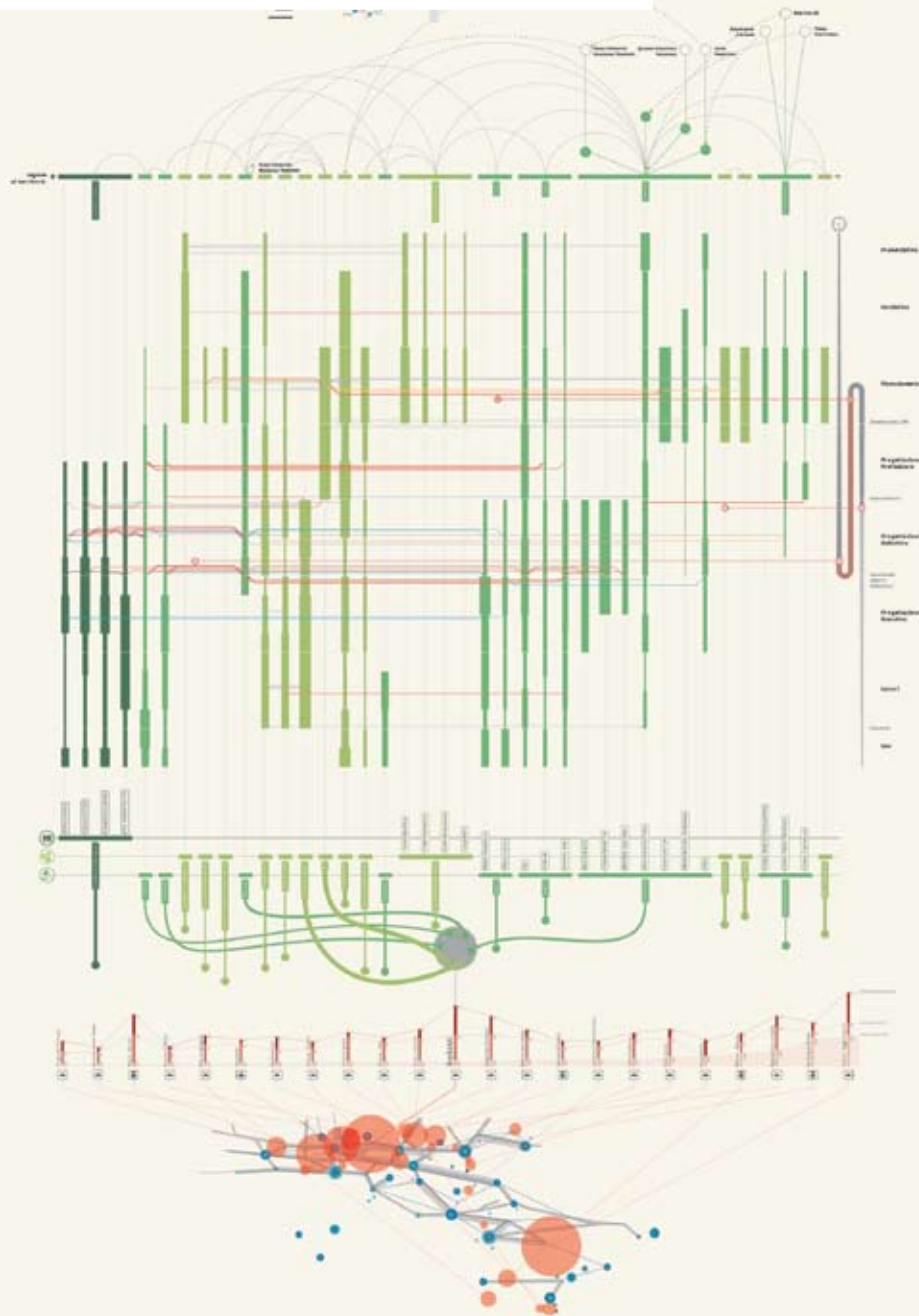
and some considerations.

**Transport Infrastructure System**

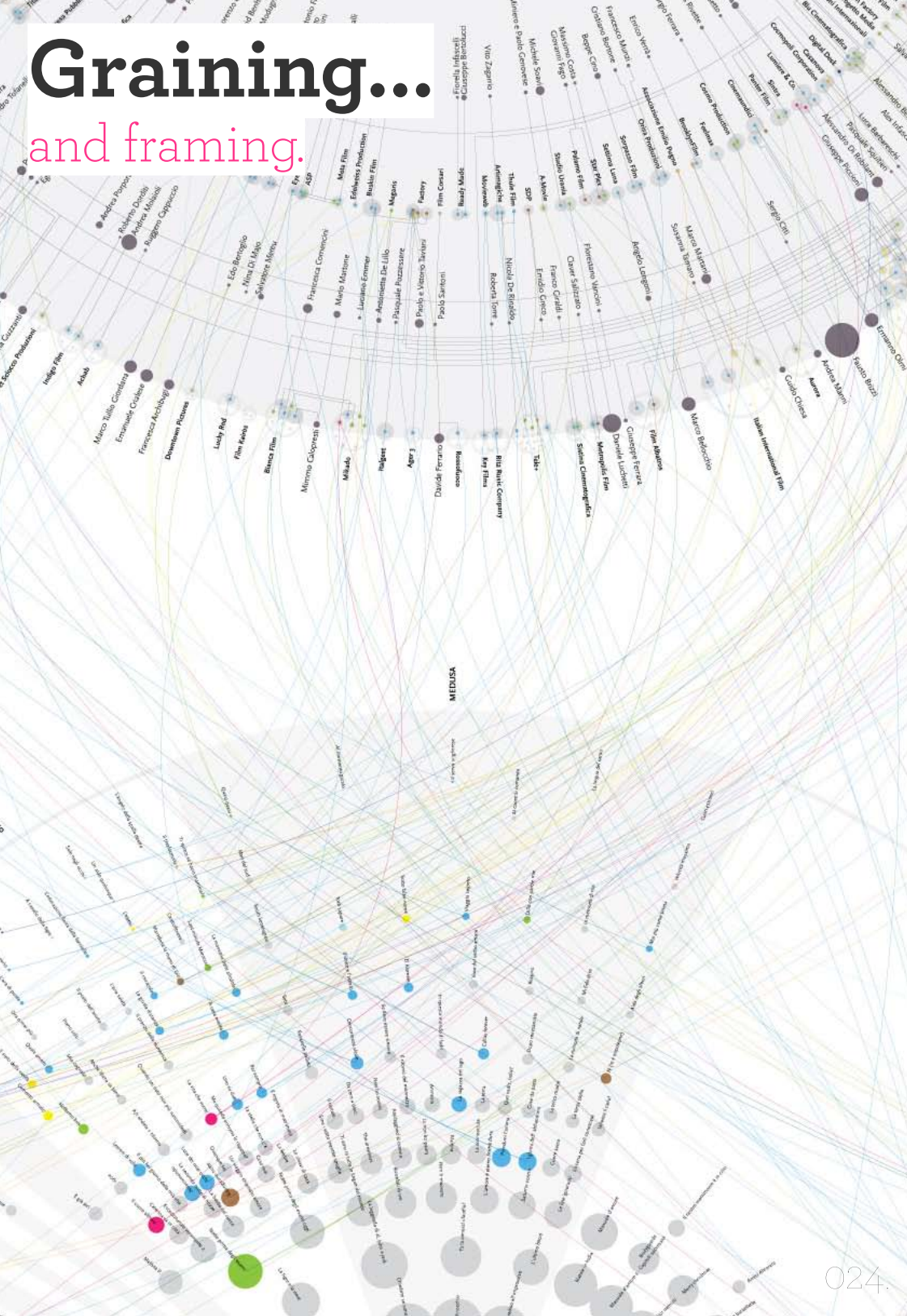
Analysing the transport system gives back a wide range in quantity and variety of forms and information available. We focused our work mainly on the infrastructure of systems and systems. We survey carefully between an existing and existing which new infrastructure needs at local level. It defines a point of time and information that regulates the system globally and their thinking.

As far as it is concerned about the analysis of new infrastructure systems, we have presented our first different roles may interact. In other words, how different can influence the system or the possibility that actually has developed given the existing system. We have therefore regard critical areas nationwide. Further RoadNet highway project we have identified the main globally and their thinking.

Statistical Methods  
Analysis of Variance  
Factorial Design  
Regression Analysis  
Correlation Coefficient  
Least Squares  
Nonlinear Models  
Time Series Analysis  
Markov Chains



In the infrastructure system the frame seems to be well defined.



# Graining...

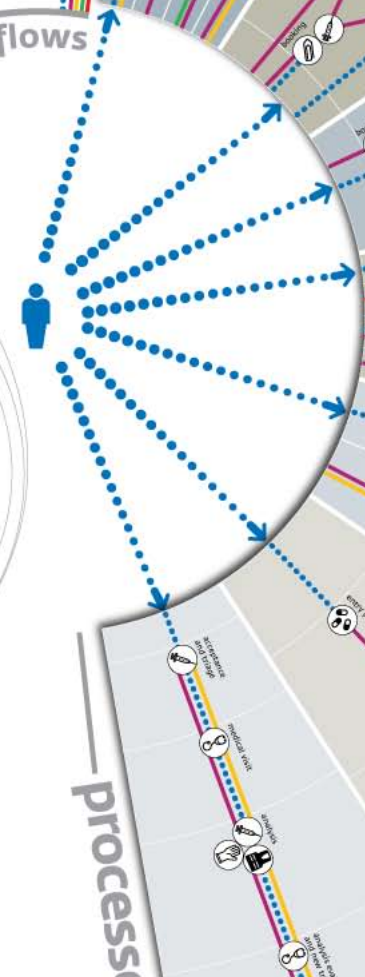
and framing.

Frames, not attuned to the purpose,  
**easily affect** graining process too.

The result is an **huge quantity** of  
single data **NOT RELATED** each other.



and framing.

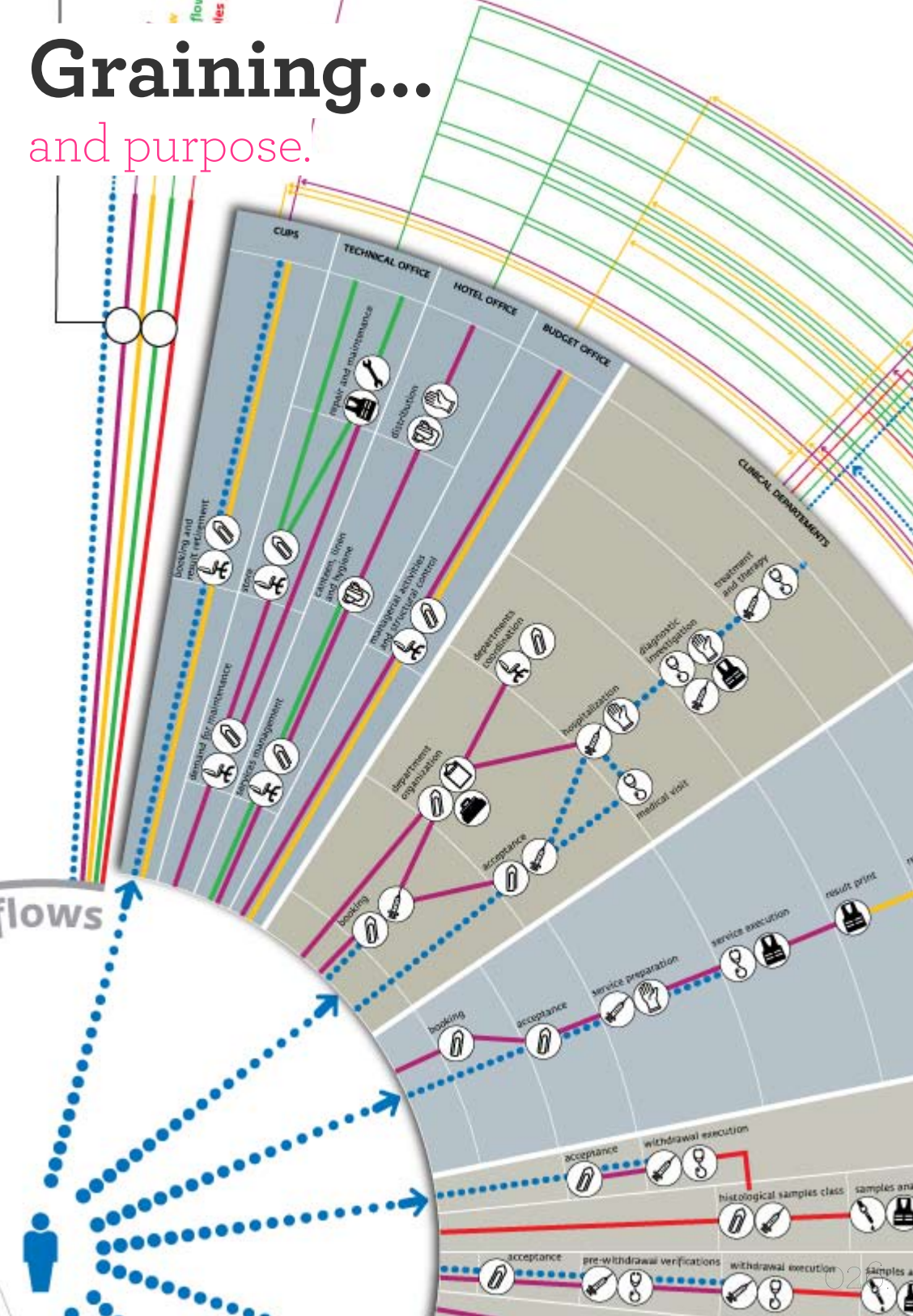


# The relationship between framing and graining is very close.

To understand which is the role of the patient in the hospital a **very coarse** level of grain has been required.

# Graining...

and purpose.

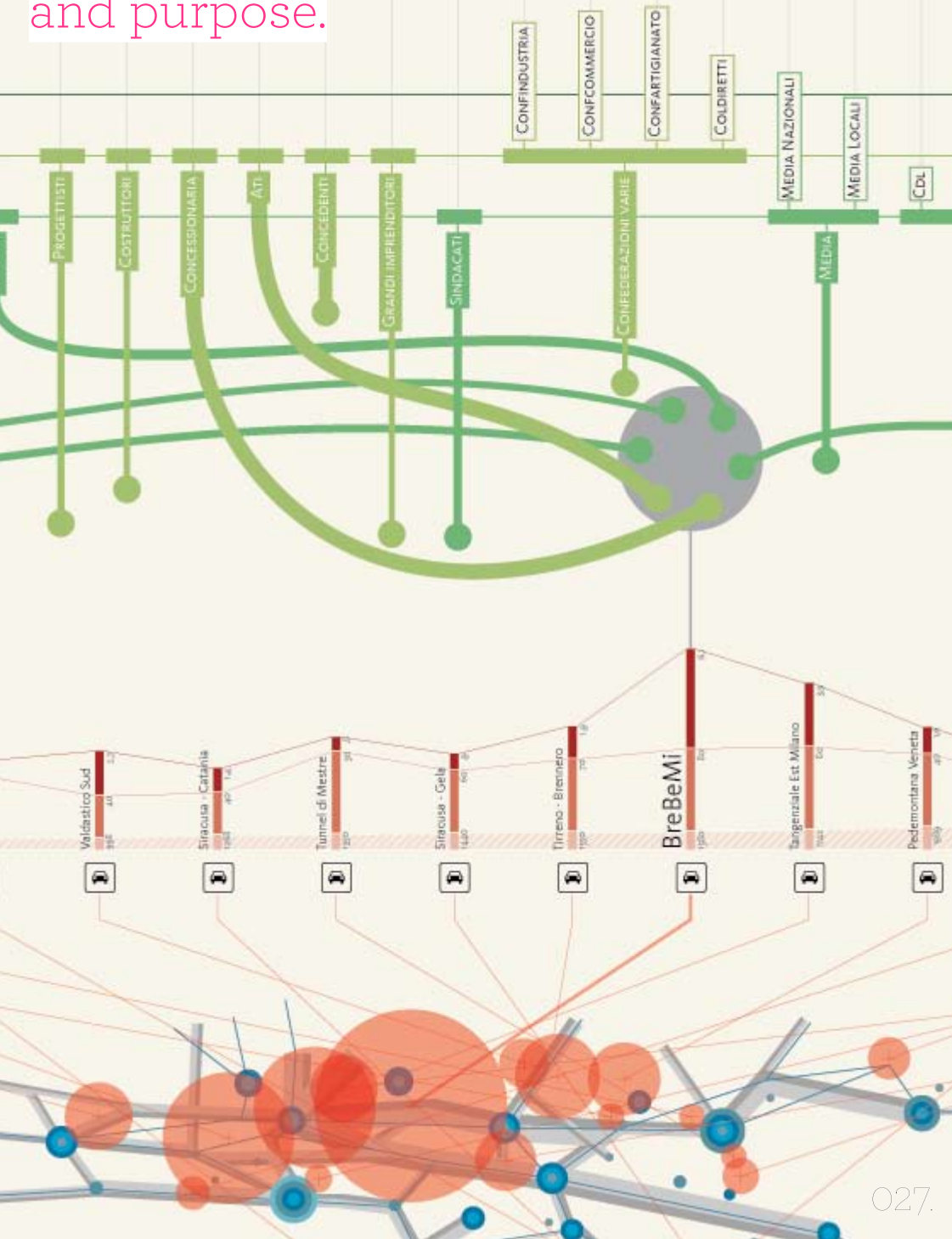


A finer graining level would have **compromised** the disclosure of the purpose.



# Graining...

and purpose.



In order **to control** the information graining some parameters have been set:

- \* the number of people involved;
- \* the percentage of project progress;
- \* the costs.

# Scaling... and difficulties.



## Contemporary Art

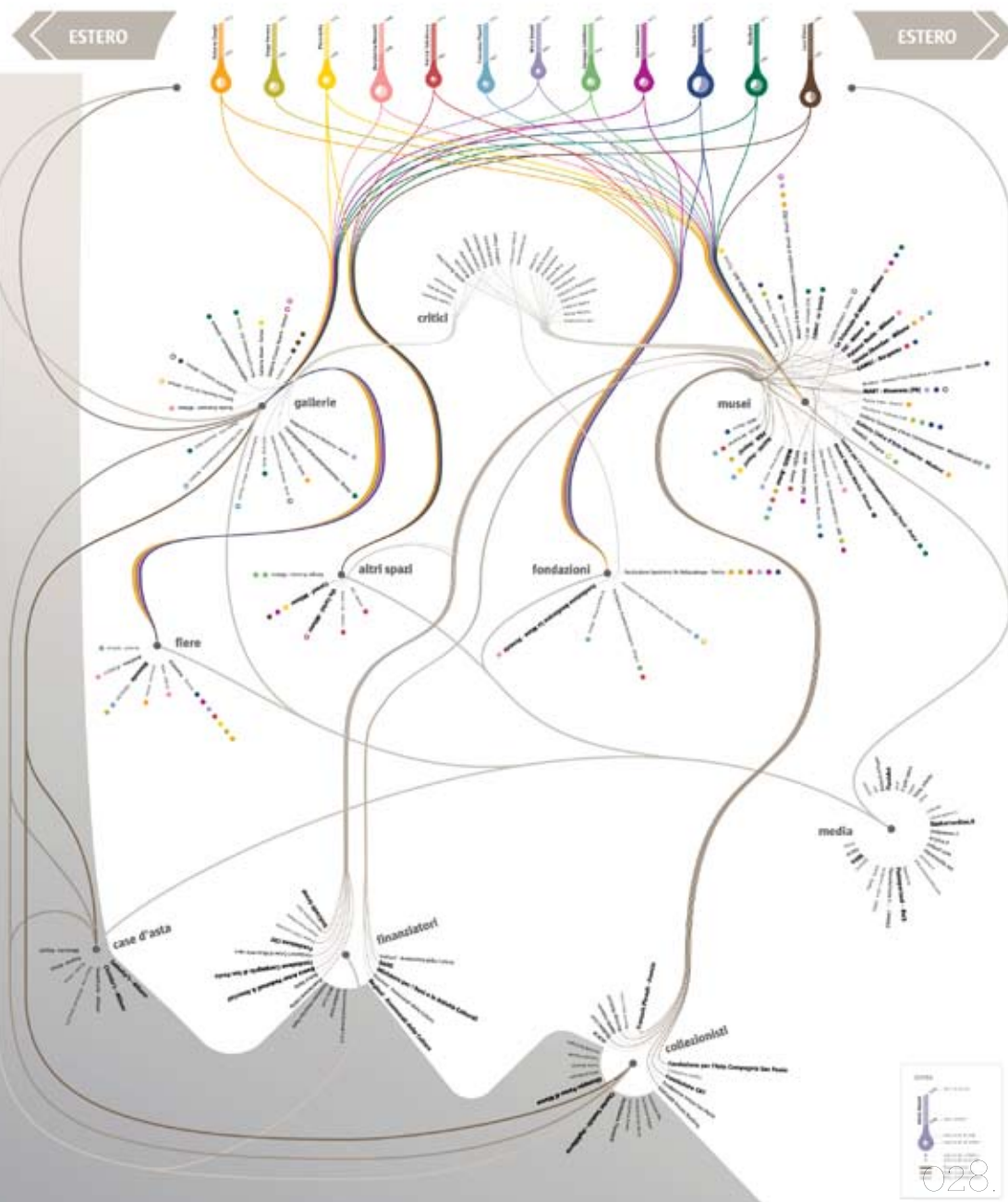
"For Contemporary Art there are therefore essential requirements needed: something created by someone and a process that results in a work setting that is an artistic frame, something like art."  
(A. Borsari, The Edge and Beyond, 2000)

It seems, in fact, that the production and enhancement of artistic is fundamentally by the logic of the market and the discourse on art. The map represents the system of Contemporary Art as being in the last few years from the point of view of critical breakthrough artists.

The artists are grouped by category and distance from the other according to their level of activity. The flow of information between the various actors (artists, galleries, museums, critics, etc.) is represented by the color of the lines.

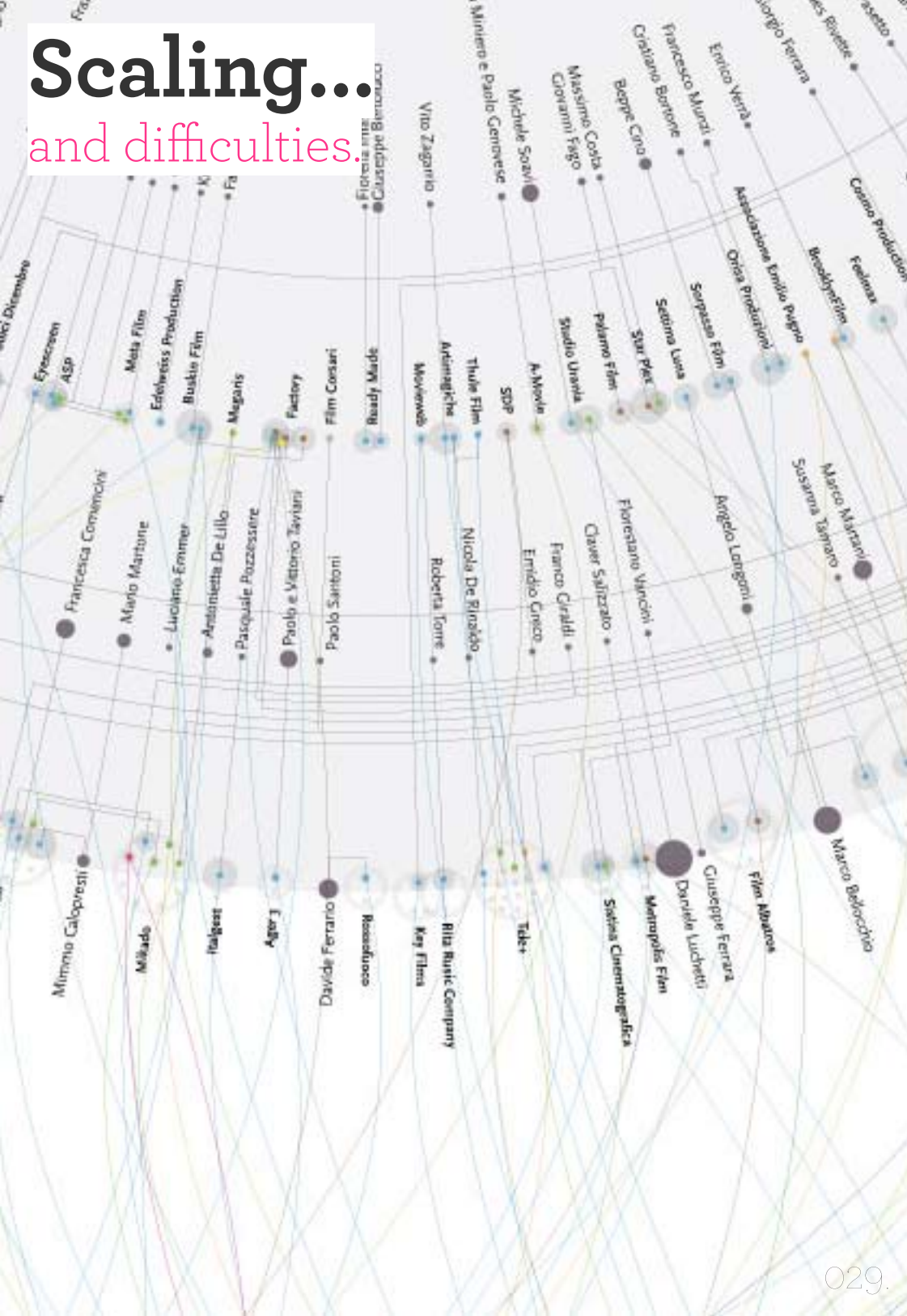
The representation of the system reveals how the process of defining value of the work is not independent activity by artists but involving different actors and how some dynamics of the system include authority building.

DANIELA BORSARI  
GIORGIO CLERICI  
CLAUDIO FATTI  
ANNA PACE  
DANIELA PIRELLA  
BORSARI & SCHIMMIELLO



A general bias to visualize the system  
as it was known:

- \* **TOO MUCH DETAILS,**
- \* **NOT ALIGNING THE DISTANCE**  
from the observed systems to the  
communicative goals pursued.



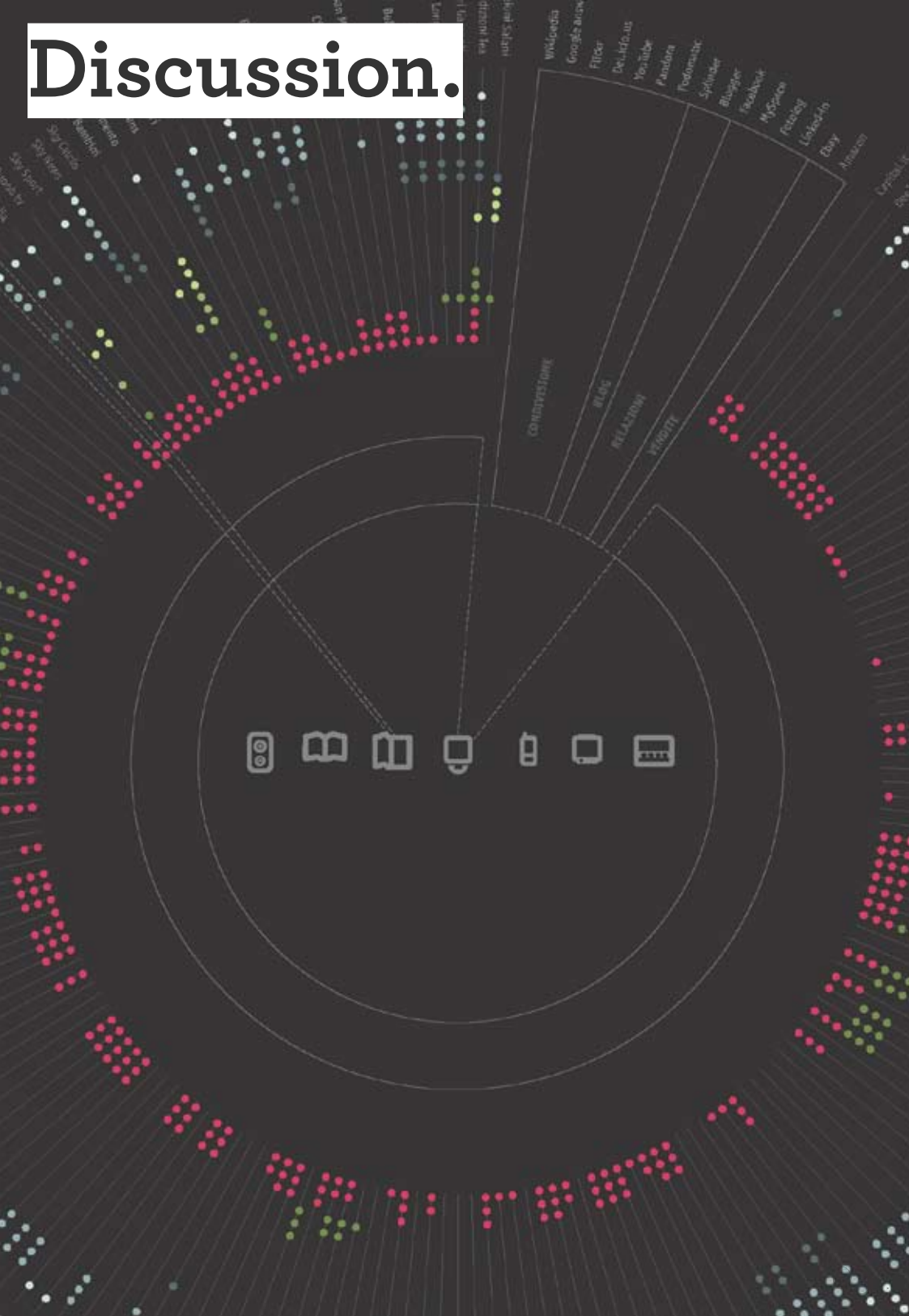
In the case of cinematographic system  
has been not provided any kind of  
scaling.



# Scaling... and coherence.

Some information has **not** been **aggregate** to clearly shown some of the analysis phase findings.

# Discussion.



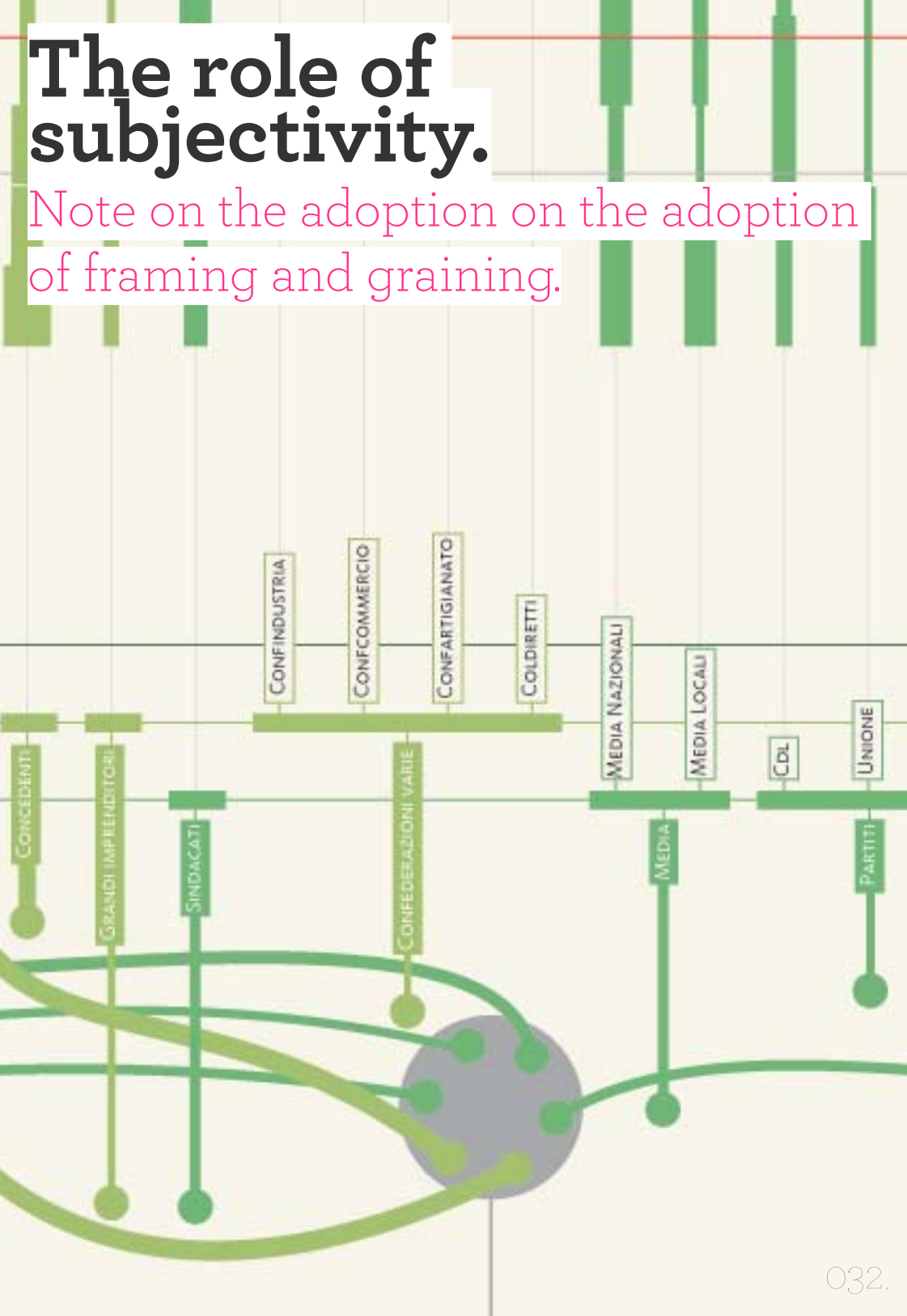
The experiments provided students a **clear reference to approach complex systems.**

**The expected data availability** affected too much the use of the tools, **influencing** both the effectiveness and the awareness in their use.

Some **difficulties** have to be noticed in the **communication** of the parameters setting **to external actors.**

# The role of subjectivity.

Note on the adoption on the adoption of framing and graining.



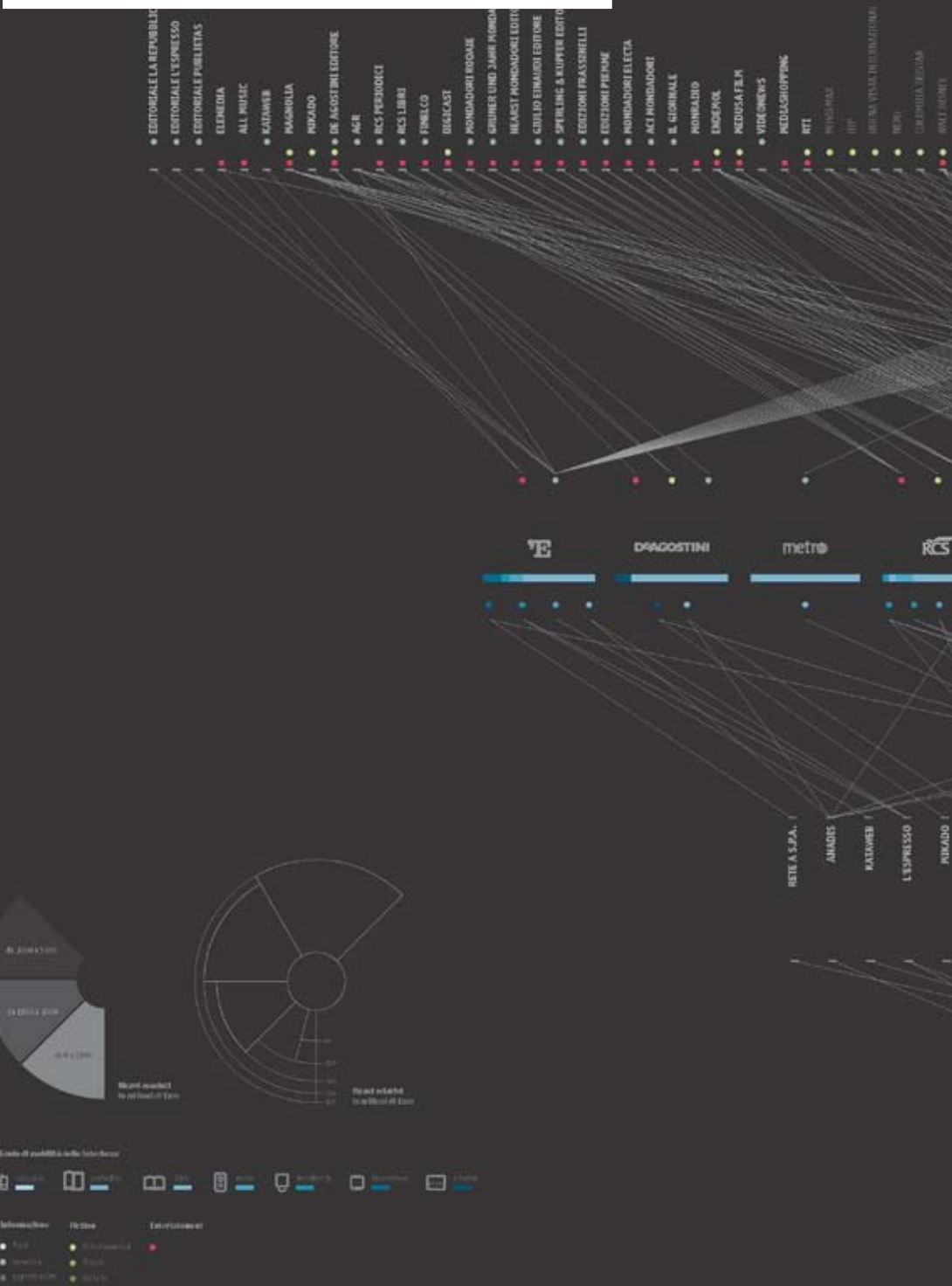
Any use of the tools is **related to who is attempting to describe the system** and affected by **biases, interests and vision**.

**The aim** and the meaning **have to be made explicit** in order to achieve a successful representation.

**EVERY REPRESENTATION HAS A COST FUNCTION OF THE DENSITY.**



## Further works.



To design proper **system to label** visualization.

A testing phase extended also to **non academic contexts**.

# THANK YOU.

[www.densitydesign.org](http://www.densitydesign.org)