RESHAPING COMMUNICATION DESIGN TOOLS.

COMPLEX SYSTEMS STRUCTURAL FEATURES FOR DESIGN TOOLS.

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PhD. Students in Industrial Design & Multimedia Communication

Politecnico di Milano

01.

INDACO Department, D.com Research Unit

CONTEXT.

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CILLIERS P., 1998. *Complexity and postmodernism : understanding complex systems*.London: Routledge.

 TAYLOR M.C., 2001. The Moment of Complexity: Emerging Network Culture.

 Chicago: University of Chicago Press.

WALDROP M.M., 1992. Complexity: The Emerging Science at the Edge of Order and Chaos. New York: Simon & Schuster.

The level of interest in Complexity Science has been constantly increasing.

IT WAS BUILT AROUND AN INTERPRETATIVE PARADIGM.

02.

The interaction processes are able to form more **complex behaviours** and to change the **structural conditions** of the system itself.



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Hard sciences study Complex Systems, Design acts within them.

Acting within complexity is a process that implies to cope with wicked problems.

COMPLEXITY AND DIAGRAMS.

THOMPSON KLEIN J., 2004. *Interdisciplinarity and complexity: An evolving relationship.* E:CO, Vol. 6, N. 1-2.

PIZZOCARO S., 2000. Complexity, uncertainty, adptability: Reflections around design research. **IN DURLING D., FRIEDMAN K.,** Doctoral education in design: Foundations for the future. London: Staffordshire University Press



QUESTION.

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What does it mean to design for a highly unpredictable bottom up 05. system with non linear interactions?

DESIGN FOR COMPLEXITY.

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ZURLO F., 2004. *Della relazione tra design e strategia: note critiche*. **IN MANZINI E., BERTOLA P. (EDS).** *Design Multiverso*, Milano: Edizioni Poli.Design.

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Designer's key competences.

To see - understand frameworks; To show - visualize information; To fore-see - anticipate critically.

DESIGN FOR COMPLEXITY.

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The design ability of render and describe emerges as an answer to the need of orientation.

To see - understand frameworks; TO SHOW - VISUALIZE INFORMATION; To fore-see - anticipate critically.



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διαγραμμα DIÀ through + GRÀMMA sign.

Our definition of diagram includes all those artefacts (maps, scenarios, charts, storyboards, etc.) that have a **revealing capacity**, a diagrammatic **attitude finalized to the act of design.**

DIAGRAMŠ.

CORBELLINI G., 2004. Attraverso qualcosa di scritto. ANY 23 Diagram Work. In

"Parametro", N. 252-253.

HYUNGMIN P., 2002. The Portfolio and the Diagram. Cambridge: MIT Pres







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Diagrams as generative tools.

Operating devices able to reveal the weak links and the driving forces that can **facilitate (or hinder)** a design intervention.

DIAGRAMS.

DELEUZE G., 1981. Focault. Paris: Editions de Minuit

DELEUZE G., GUATTARI F., 1976. Rhizome. Paris: Les Editions de Minuit

ALLEN S., 1998. Diagrams Matter. VAN BERKEL B., BOS C. (EDS), Any Magazine,

N.23, Diagram Work.



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A graphic shortcut.

"It is a machine that is almost blind and mute, even though it makes others see and speak".

A diagrammatic design is not necessarily the one that uses diagrams, but is the one that **behaves as a diagram.**

DIAGRAMS.

DOSI G., MARENGO L., FAGIOLO G., 1996. *Learning in evolutionary environments.* Working paper. University of Trento, Computable and Experimental Economics Laboratory.



Diagrams are tools to reduce the gap.

KNOWLEDGE-GAP

The **incomplete or inaccurate representation** of the system.

PROBLEM-SOLVING-GAP The difficulties to **cope with project tasks.**

COMPLEX SYSTEMS AND DIAGRAMS.





For a new mindfulness.

The structural features of Complex Systems have been our key points to outline a methodology that **use diagrams** to offer designers a new **mindfulness** in the use of design tools.

METHODOLOGY.



ANALYSING. TO ANALYSE ELEMENTS.

CAPRA F., 1996. *The Web of Life: A New Scientific Understanding of Living Systems*. New York: Anchor Books.

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Complex Systems consist of a large number of elements.

TRACING A STRUCTURE OF THE SYSTEM UNDER EXAMINATION.

014.

An analytical process it is **not sufficient** to fully understand a Complex System, it consents to identify the system elements and their features.





5

ANALYSING. TO ANALYSE ELEMENTS.



landover baptist church joey skaggs tardetmkt society for a logo free TV franke stine the aesthetic meat foundation together we can defeat capitalism the grey sweatsuit revolution hyper redundant mart free words project Unamerican activities santarchy public space initiative casseurs de pub caspam SCCPP team 7 IPBnetwork social activism reclaim the streets mayday brainframes adbusters urbanised I'm changing the climate motivados esterni soy bomb nation bordergames dissidences communes mejor vida corp infokiosques BAP infiltration strano network luther blissett the wirled bank paysages de france sexyshock MDPI datablob stay free! 0100101110101101 ®™ark post consumer production antitrend.com corpwatch the sniggle conglomco RAP tactical media crew corporate watch chain workers are you generic? modern TV the ves men disinformation aarrg guerriglia mkt disinformazione new global vision candida false advertising IAA negativland popaganda buga up earth first! the detroit project

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ANALYSING.

TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING. TO SET A PROCESS OF COARSE GRAINING.



017.



Complex Systems are open systems. DEFINING THE SCALE OF THE DESCRIPTION.

Complex Systems lack explicit boundaries that are settle on to confine the system for a **particular purpose**.

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ANALYSING. TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING.

TO SET A PROCESS OF COARSE GRAINING.

GELL-MANN M., 1994. The Quark and the Jaguar. Adventures in the Simple and the *Complex*. New York:Freeman.







Complex Systems are open systems.

MAKING APPROXIMATION BY IGNORING DATAILS ON FINER SCALE.

It set the right level of details in order to maintain a **manageable** but **recognisable** image of the system.

ANALYSING. TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING. TO SET A PROCESS OF COARSE GRAINING. 620 TO MAKE A VISUAL DESCRIPTION. 250 G12 650 50 39 Si ai S 55:0 si 520 52:0 SEC 59:0 019.

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The field of Complex Systems is interested in relationships.

TRANSLATING THE STRENGHTS AND THE TENSIONS AMONG AGENTS.

Diagrams are the **typical instruments used by designers** to describe reality. Diagrams display **not only quantitative data** but also viewpoints, perspectives and values of the system observer.



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A political act.

THE POLITICAL NATURE AND THE PRINCIPLE OF RESPONSIBILITY

Each representation of reality are **intentionally structured** and thus **arbitrary, anexact and incomplete.**

The United States of America ANALYSING. TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING.

TO SET A PROCESS OF COARSE GRAINING.



TO MAKE A VISUAL DESCRIPTION.

PINPOINTING. TO RE-ARRANGE INFORMATION.

HEIJDEN VAN DER K., 1996. *Scenarios: The Art of Strategic Conversation*. Chichester: John Wiley & Sons.

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Complex Systems consist of individual agents clustered together.

CLUSTERING AND OBSERVING THE DENSITY OF THE ELEMENTS.

It is a process of **pattern recognition**.

ANALYSING.

TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING. TO SET A PROCESS OF COARSE GRAINING.

REPRESENTING.

TO MAKE A VISUAL DESCRIPTION.

PINPOINTING.

TO RE-ARRANGE INFORMATION.

TIMING. TO DEFINE HOW THE TIME HORIZON WILL BE. TO CREATE A MONITOR REGIME.



Complex Systems have a history, interaction are non linear.

MAKING PERIODICAL EXHAMINATION OF INTERVENTIONS.

Any analysis of a Complex System that ignores the dimension of time is a **synchronic** snapshot of a **diachronic** process.

ANALYSING.

TO ANALYSE ELEMENTS. TO SET A PROCESS OF FRAMING. TO SET A PROCESS OF COARSE GRAINING.

REPRESENTING.

TO MAKE A VISUAL DESCRIPTION.

PINPOINTING.

TO RE-ARRANGE INFORMATION.

TIMING.

TO DEFINE HOW THE TIME HORIZON WILL BE. TO CREATE A MONITOR REGIME.

TELLING.

TO IMAGINE FUTURES. TO BUILD UP COARSE-GRAINED STORIES.

GELL-MANN M., 1994. The Quark and the Jaguar. Adventures in the Simple and the *Complex.* New York:Freeman.

JONAS W., 2005. *Designing in the real world is complex anyway - so what? Systemic and evolutionary process models in design*. European Conference on Complex Systems Satellite Workshop: Embracing Complexity in Design, Paris 17 Nov.

SCHWARTZ P., 1991. *The Art of the Long View: Planning for the Future in an Uncertain World*. New York: Doubleday.

As future of a system are imaginative, transformation into stories helps coping with complexity.

CONCEIVING THE FUTURE AS PROJECTIVE SPACE.

Designers could consider the future as a source of creativity. A coarse-grained story is the set of all **alternative fine-grained stories** that **converge on a specific behaviour** of the observed and **diverge on** all the possible behaviours of **what is not observed**.

TO SUM UP:

TO ACQUIRE INFORMATION

1. ANALYSING: PARTS

to analyse elements to set a process of framing to set a process of coarse graining

TO TURN INFORMATION INTO KNOWLEDGE

2. REPRESENTING: RELATIONS to communicate visual descriptions of the system

3. PINPOINTING: CLUSTERS to rearrange information

TO MANAGE A DESIGN INTERVENTION

4. TIMING: HORIZONS

to define how far the time horizon will be to create a monitoring regime

5. TELLING: SCENARIOS

to imagine futures to build up coarse-grained stories

We do not replace traditional design tools, we suggest a different use.

TO DEVELOP THE ABILITY TO THINK IN A COMPLEX RATHER THAN COMPLICATED WAY.

TO VALUE EQUALLY CONNECTIONS AND ELEMENTS.

CREATIVITY AND INNOVATION.

TO CONSIDER THE SYSTEM UNPREDICTABILITY AS A SOURCE OF

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THANK YOU!