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Structuring Short-Term Organizational Memories by Argumentation Based Transient-Scenarios

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introduction

Research work aim at capturing and making available **organizational memory** referring to organization emerging when developing spatial plans environmentally oriented

Referring environmental planning domain a **conceptual model** describing the production and use of both short-term and long-term organizational memory is presented

Focus on the role of argumentation in explaining the **rationale of decisions** occurring all along the decision making process

Use of **argumentation models** to partially explain the evolution of what we are going to call process scenario

In **environmental planning domain** decision making processes

- are often carried out in collaborative knowledge intensive environments
- deal with 'wicked problems' that need argumentation processes to allow the problem situation to be explored and possible action solutions to be discussed by stakeholders

Argumentative contents are common forms of practical reasoning among stakeholders and their role is to explain knowledge created and used during interactions and make it explicit

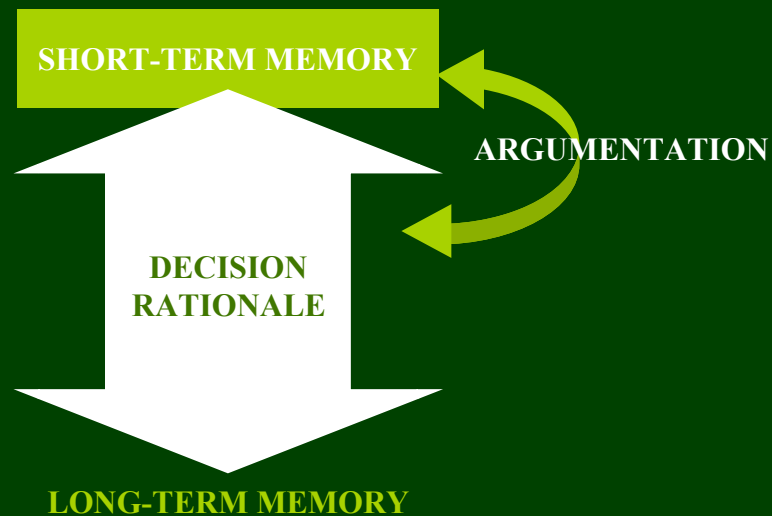
In general:

long-term organizational memory refers to those structures and contents of organizational memory being stable like values, principles, cognitions shared throughout the organization

short-term organizational memory represents essentially working memory, is deeply related to a specific decision making process and is relevant for supporting the decision process itself

Short-term memories are evolving entities supplying contents and knowledge to **long-term memory** throughout other mediating memories

A relevant mediation role between the **short-term memory** and the **long-term memory** is played by the **Decision Rationale (DR)**, considered as a special kind of intermediate memory



DR is a representation of the reasoning behind decisions

In **environmental planning** decisions are reached by means of collaborative decision making process involving multiple actors, with multiple needs, values, objective and interest the representation of Decision Rationale need to pass by capturing and structuring of argumentative contents produced

Argumentation is crucial due to its role both in:

- ✓ making Decision Rationale explicit, and
- ✓ explaining modification of the short-term memory along time

Memory as process

In environmental spatial planning

- decision making processes aim at developing spatial plans which are sort of **future scenarios** containing strategic prescriptions
- to keep trace of the assumptions, values, experiences, conversations, and decisions as they evolve along time enable reflection for the action-oriented **scenarios development**

Scenarios are continuously evolving throughout the argumentative dynamics of stakeholders interactive work

the interest is not only in knowledge in itself but also in the underlying context of knowledge and the process that created it at the time it is created

We defined them '**process-scenarios**'

process-scenario

- ✓ is a scenario which evolves together with its related decision making environment and with the action itself
- ✓ includes a process-memory and a short-term memory

The ***process-memory*** represents an evolutionary stepping stone to long-term organizational memory: it is the “Design Rationale” as the reasons behind environmental planning decisions

The ***short-term memory*** has got an operative role:

- ✓ it represents the support of the operative environment where decisions are made
- ✓ it contains, at the generic time t , the current version of the environmental scenario and the whole cognitive content developed, acquired and created referring to that version

We defined such an operative short term memory a ***transient-scenario***

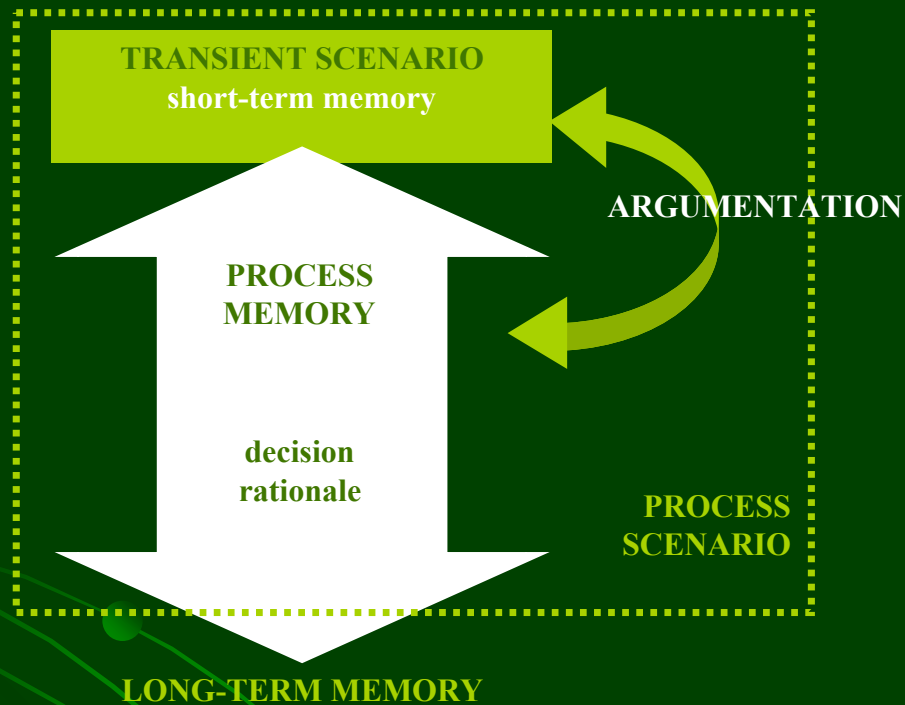
In environmental planning processes a **transient-scenario** contains:

- **the current version of the plan** (a textual part and a cartographic image of the environmental planning area) and
- the whole set of observations, comments, micro-decisions, and suggestions (**argumentative contents**) produced throughout the interaction and not yet deliberated by the stakeholders.

A *transient-scenario*, at the generic time t:

- takes a picture of “current” knowledge
- is the platform where information and knowledge are collected and referred
- captures the context of specific ideas, decisions, and actions created by the stakeholders involved
- is a knowledge “container” facilitating experimentations on and modifications of contents themselves
- supports the knowledge representation in a dynamic format through its transactions with time

The proposed conceptual model



process-scenario:
the evolutionary stepping stone
to long term organizational
memory from

transient-scenario:
the working memory initiating the
structuring of knowledge
fragments being, later on, stored
in the process-scenario

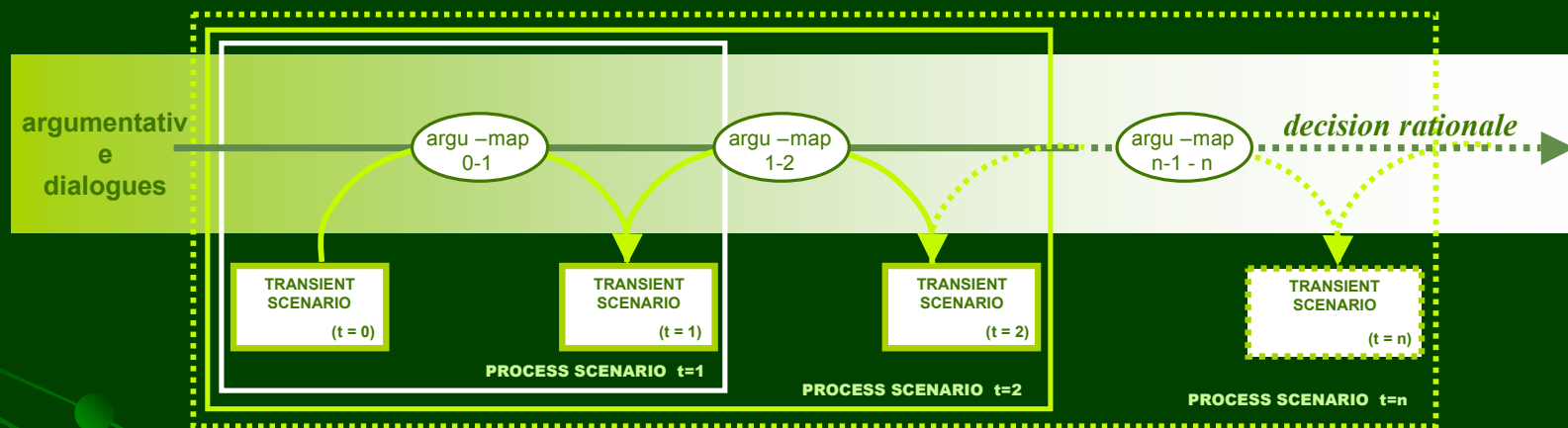
transient-scenarios collect and organize information and knowledge to be structured by a Decision Rationale support system and then dynamically represented and stored in the ***process scenario***

If we imagine the **process-scenario** structured by the sequence of transient-scenarios, the links between one transient-scenario and the subsequent one is represented by argumentative-maps (argu-maps)

argu-maps are asked take memory of argumentative dialogs, to explain and part of the scenario evolution

Transient-scenarios and argu-maps give shape to the process-scenario in form of Decision Rationale as a tool mediating between short and long-term memory

The process scenario development



In the perspective of an ICT system supporting this conceptual model it is necessary:

- to take into account a content repository and a context repository, both structured and organized in a process memory
- to sustain a **dynamic representation of the memory** of the organizational field of intervention
- to manage a process memory including both the **knowledge evolution** and the **argumentative base** explaining such evolution

The development of the ICT system would be supported by:

- a work space **managing** the argumentative **dialogue** (to capture and explore knowledge) (i.e. electronic forum, virtual meeting rooms and e-mailing systems)
- **Decision Rationale tracing** support (argu-maps as an argumentative model to structure knowledge)
- a representation of all contents composing the scenarios (i.e. GIS systems showing cartographic images, text viewer or hypertext connecting the database)

In the following we focus on the argumentative model

Tracing Decision Rationale

Actors can handle the deliberative process throughout either face-to-face meetings or remote interactions in which each stakeholders arguments his/her personal position about specific planning issues

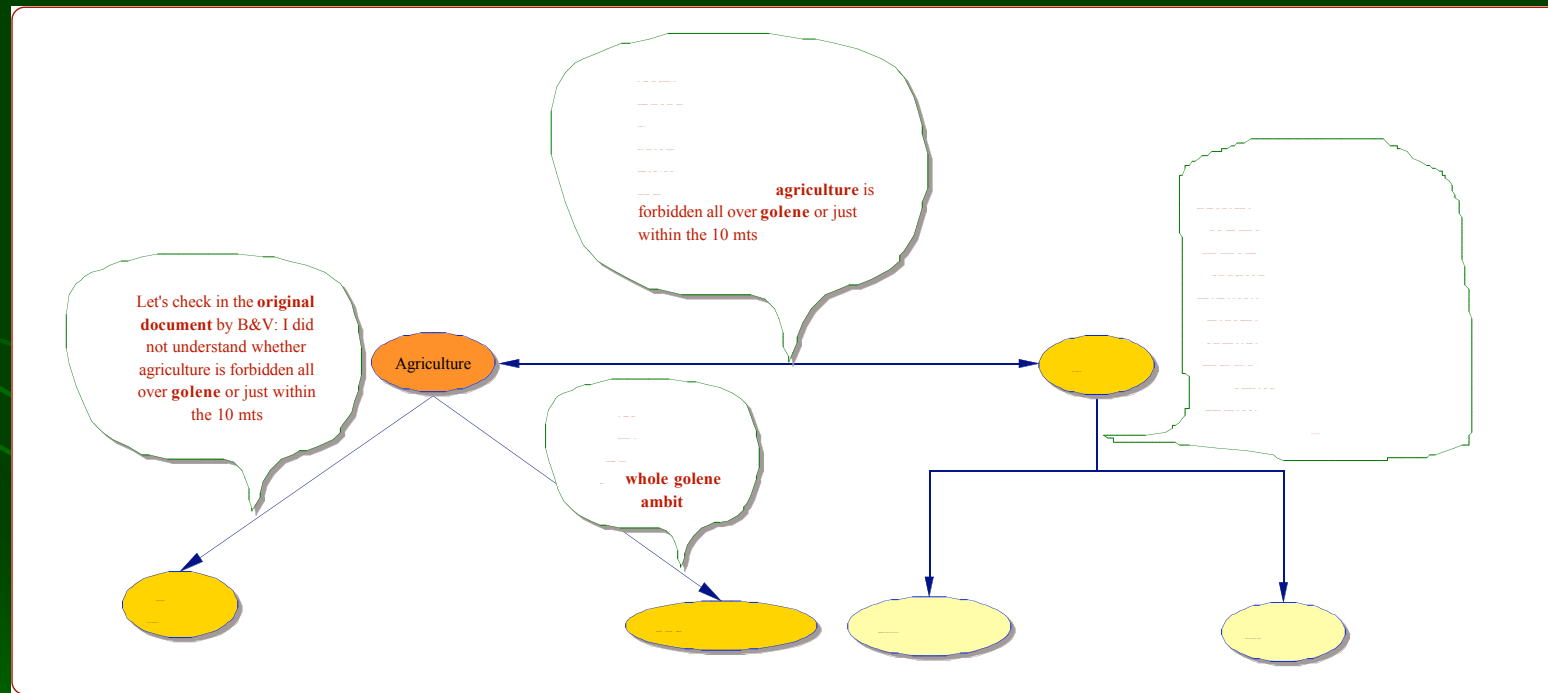
In the field of artifact design the need to keep trace and reuse the knowledge generated during the design collaborative processes is attributed to **design rationale**

Transpose methods, conceived for design artifact, to decision environments characterizing environmental planning processes

The accent is given to decision steps and argumentations generated during collaborative interaction of stakeholders

Our attempt is to convey argumentative contents into **argumentative-maps** representing special *cognitive maps* keeping trace of the reasons and events inducing a transaction between two subsequent **transient-scenarios**

In the following we show an example of **argu-map** structuring and representing a specific discussion



Argu-maps have to be structured and deduced according to two main objectives:

- to explain, partially, the transaction between subsequent *transient-scenarios* namely, to justify, in a simplified structure, the evolving way to look at the problem at hand
- to give a synthetic and more easily explorable representation of the Decision Rationale

Argu-maps enhance the Decision Rationale role to be a collaboration means:

- supporting stakeholders in gaining awareness about the evolving scenario
- structuring the short-term memory used from the emerging organisation to explore different possibilities and to reach shared micro-decisions
- supporting and explaining reflection/ action activities all along the planning process

Preliminary considerations and future agenda

The conceptual model proposed derives from experiences and observations carried out in the environmental planning domain and focuses on potentials of knowledge management in supporting the creation, management and use of evolving organizational memory in collaborative decision support systems.

Generalizing could be valid in those domains where:

- ✓ decision making is characterized by collaboration and knowledge intensive interaction among stakeholder
- ✓ strategic planning activities are carried out in a futures visioning approach
- ✓ the dynamics of organizational memory is relevant for knowledge management and decision support

We can also remark that:

Argu-maps can be considered valuable tools for process memory exploration since they provide the structure for the user to explore and interpret the contents of that memory (argu-maps represent a sort of self-reflection tool helping users to reach a better awareness about his own and the group's cognitive path)

Argumentation, produced during the collaborative planning process, **produce Decision Rationale knowledge** that is captured as informal knowledge and represented in form of argu-maps

Future research challenges can be:

- exploring new tools to **capture knowledge flows in their complete forms** (not only explicit like texts or vocal, but also tacit such as gesture, nods and looks which are also parts of human communication)
- to assist argu-maps with an argumentative model having more **easy and quick inference rule** and able to **manage complex ontology**



Thank you

Anna De Liddo