CONTEXT MODELING: A CONTRIBUTION FOR DATA INTEROPERABILITY

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Number of Web pages with the word "context"

1996	750 000
2001	3 000 000
2002	16 000 000
2003	19 000 000

- Introduction
- Definition(s) of context
- Procedures and practices
- Contextual graphs:
  - Presentation
  - Dynamic of context
  - Explanation and incremental acquisition
  - Implementation status
- Key points

CONTEXT OF THE PRESENTATION

(ALSO KNOWN AS INTRODUCTION)

Context of the presentation

Examples:

- **need to switch between contexts**
- **inducing a false context**
- **the letter and the spirit of the law**
- **mismatch of contexts in History**

Failures in AI

The SEPT application

A UNIVERSAL DEFINITION OF CONTEXT?

Towards a definition of context

Two opposite views
A number of definitions
Our experience in studying context:

Towards a definition of context

Our experience in studying context:
- a working definition
- context and knowledge
- three types of context
- an example
- context construction
- heterogeneity of context

Towards a definition of context

A working definition:

Context is what constrains problem solving without intervening in it explicitly

Example in the SART application:

The occurrence time of an incident on a subway line is not relevant by itself, but the methods observed for incident solving are different at rush hour or not.

Our definition of context

Three types of context:

- **external knowledge,**
- **contextual knowledge, and**
- **proceduralized context.**

The dynamic dimension of context

Our definition of context

The proceduralized context is a part of the contextual knowledge that is invoked, structured and situated according to a given focus.

The proceduralized context may be compiled but can generally be elicited with the usual techniques of knowledge acquisition

An example

Suppose I say to a person that knows me:

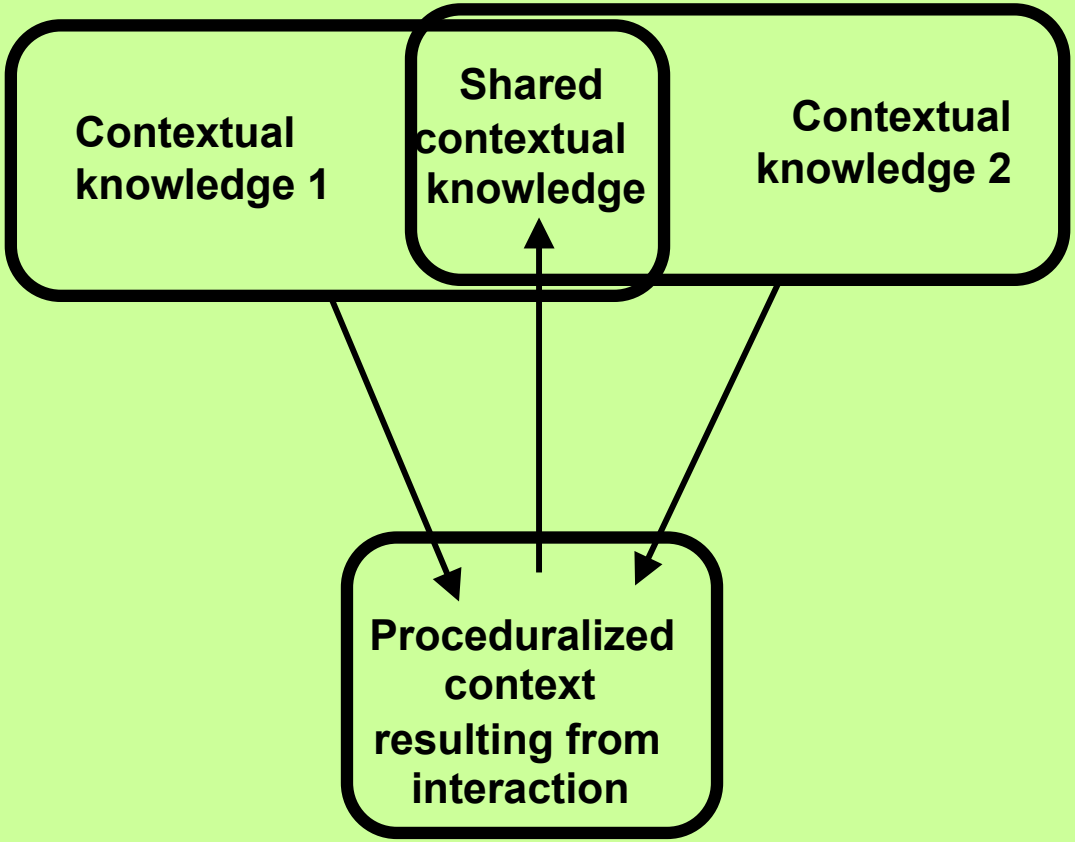
CK° : "In my lab this morning, I heard a lion roar."

What is unusual is the link between the two CKs:

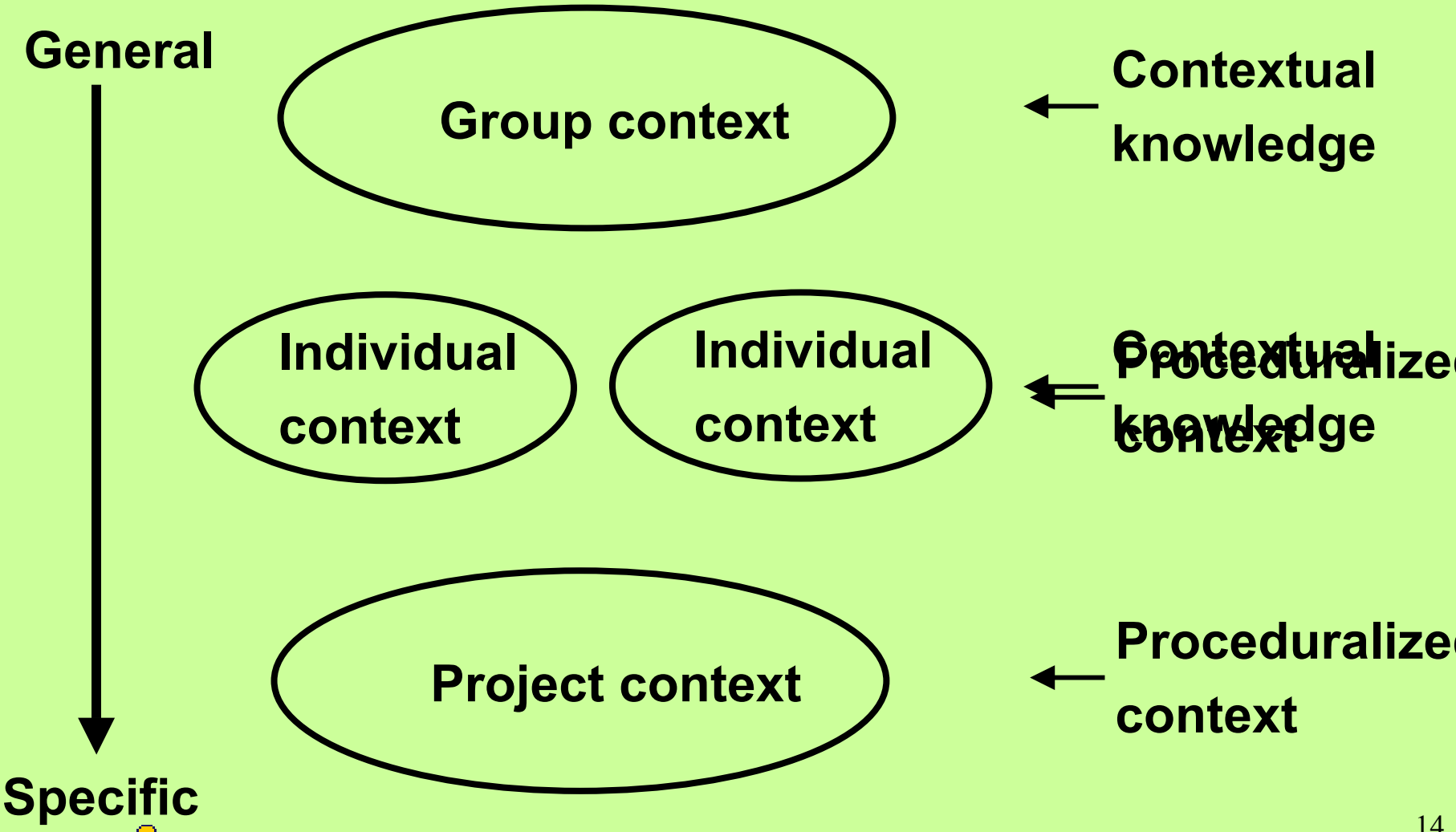
CK-a: I work in a CS department

CK-b: I heard a lion roar

Building of the proceduralized context



Layers of context



Contextual Graphs

Formalism: for what?

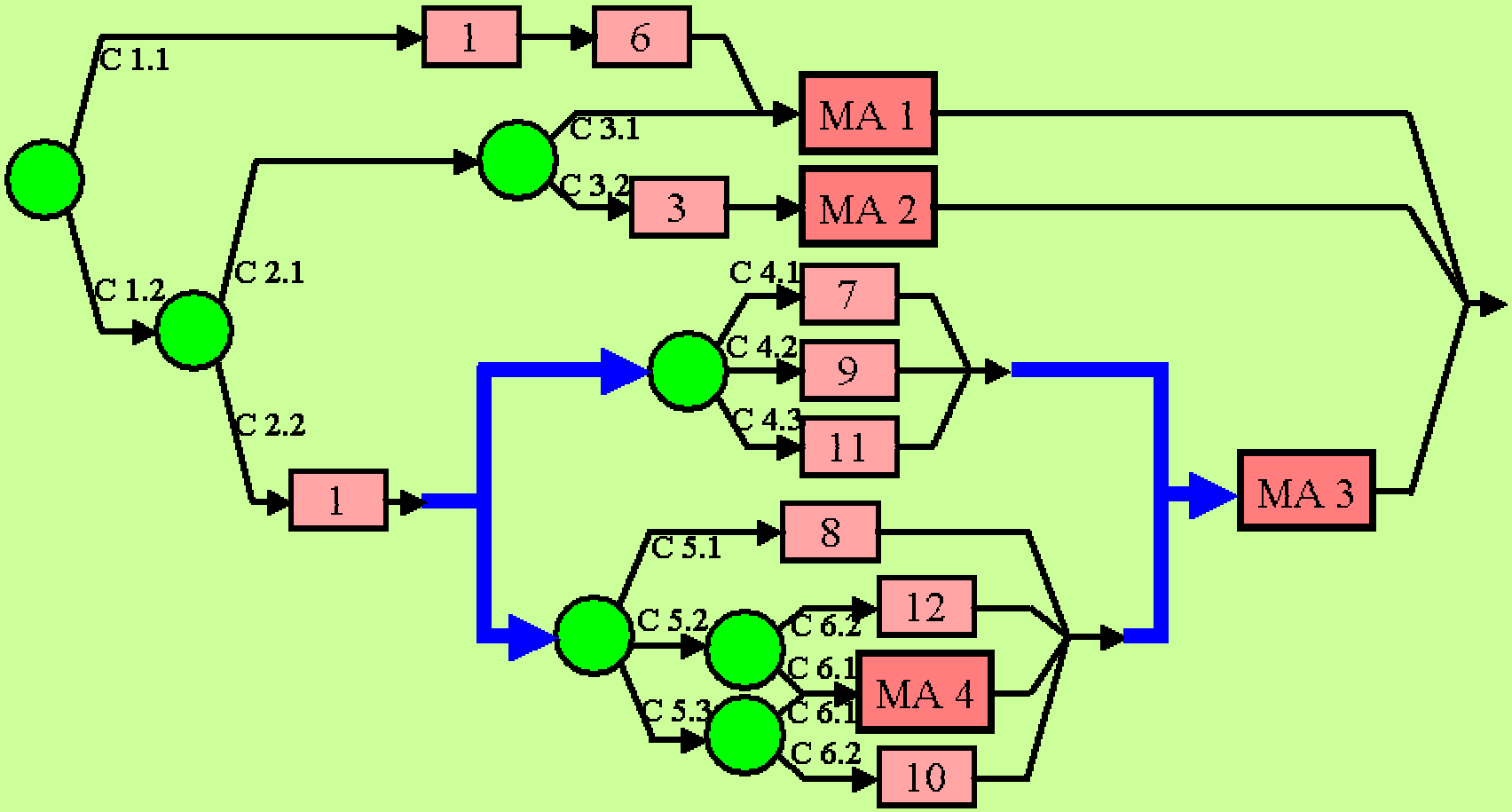
Contextual graphs represent:

- a temporal sequence of diagnosis and actions

- the different ways to reach a goal

- the elements for choosing the right action sequence

Formalism: An example

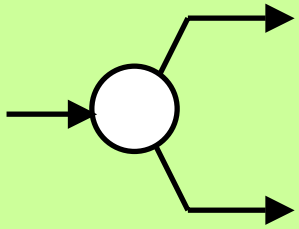


Formalism: The symbols

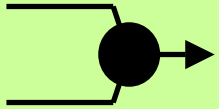
Action

Activity

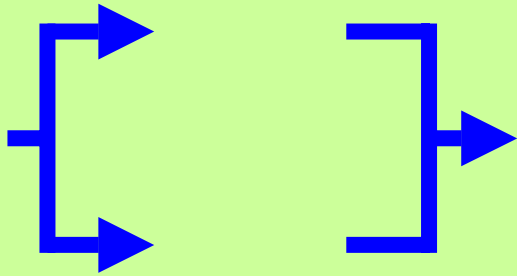
Contextual node



Recombination node

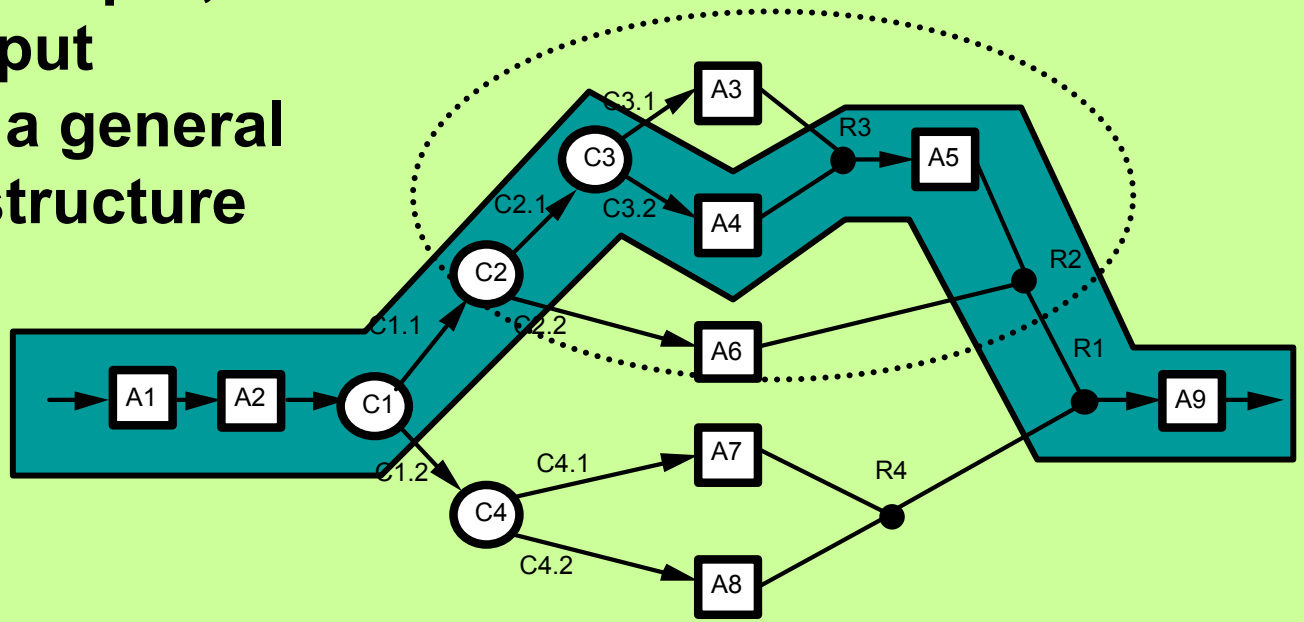


Parallel action grouping

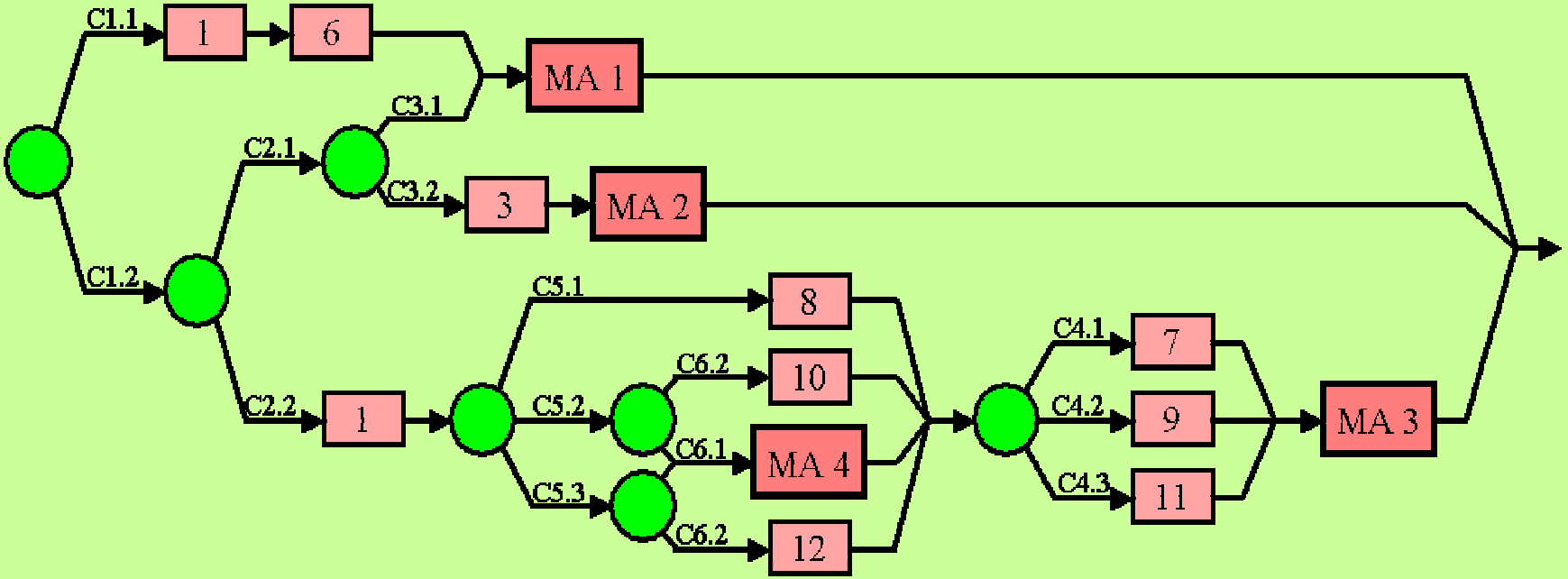


Formalism: Characteristics

Contextual graphs are:
- directed,
- acyclic,
- with one input, and one output
and with a general spindle structure



Formalism: Parallel action grouping



Key points

KEY POINTS

Key points

Context is relative to:

--> something (e.g. an item, a focus)

--> a point of view (observer, a goal)

Key points

A working definition:

Context is what constrains a reasoning without intervening in it explicitly

Key points

Three types of context:
External knowledge,
Contextual knowledge, and
Proceduralized context.

Key points

Context has a granularity with:
- contextual knowledge at one level and
- proceduralized context at a lower level

Key points

The dynamic of context is a movement between the contextual knowledge and the proceduralized context

Static and dynamic aspects of the context are intertwined

Key points

Contextual graphs constitute:

- a formalism tailored to the reality of the enterprise (procedures and practices, incremental learning capability)

- corporate memory: capitalization and multi-uses

- a basis for intelligent system development

Key points

Parallel action grouping: a limit of the representation or a problem of interwined levels of the representation?

Need to modify dynamically the contextual graph (e.g. the example of the coffee preparation)

Key points

Contextual graphs in AI are similar to the notion of schemes of action in Cognitive Science

A scheme of action is a mental unit to guide the action

For managing new situations by assimilation (integration of specifics) and accommodation (enrichment with new strategies)?

Propose a type of knowledge chunking for reasoning

CONTEXT DYNAMIC AND EXPLANATION IN CONTEXTUAL GRAPHS

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