Trace-based framework for Experience Management and Engineering

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Introduction / plan

≡ **Context**

≡ **Experience Management issue**

≡ **Activity reflexivity need**

≡ **Trace-based approach**

≡ **Applications in Experience Management**

≡ **Framework for Trace-Based Systems**

≡ **Conclusion**

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Context

- **Experience Management challenge**
  - Tacit knowledge in work situations
  - Identify, capitalize and reuse experience
  - Particularly the case in mediated work situations and high-level abstraction tasks

- **Focus on**
  - Digital Documentary Spaces
  - Complex Tasks
  - Example: Economic Intelligence on the Web

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Context

- **Digital Documentary Spaces**
  - A digital environment including a large sets of digital documents and the tools to manipulate them.
  - Web sources, Databases, Web pages, Blogs …
  - Search and collect tools, communication tools …

- **Complex tasks features**
  - High level – domain and web knowledge
  - Dynamic – evolutive process
  - Open-ended – unstable goal
  - Context dependent – depending on current situation

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Experience Management issue

- **Complex mediated tasks**
  - These tasks generate rich interactions which hold on the experience of <u>environment use</u>.
  - A few information about these interactions remain available in a digital space. Only the <u>results</u> of the activity are presents to users.
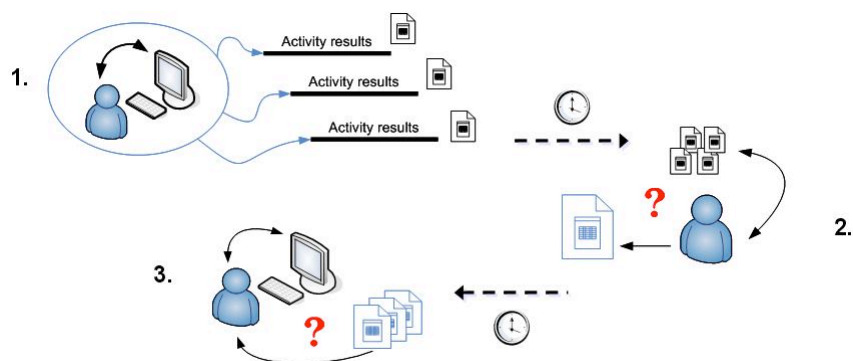
- **It's difficult to capture this experience because:**
  - Experience and knowledge are built <u>dynamically</u> through interactions with a system.
  - Users are not automatically <u>conscious</u> of their experience.

- → **Need of "activity reflexivity"**

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Experience Management issue

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Reflexivity need

≡ Reflexivity in task realization

- Difficult to <u>identify and remember</u> experiences, and then to capitalize it, share it, and reuse it.
- We can define <u>activity reflexivity</u> as the access to a representation of our own activity.
- Numerous works have shown the benefits of activity reflexivity, particularly in mediated environment.
  - Activity structuration

≡ What methods to provide reflexivity to users ?

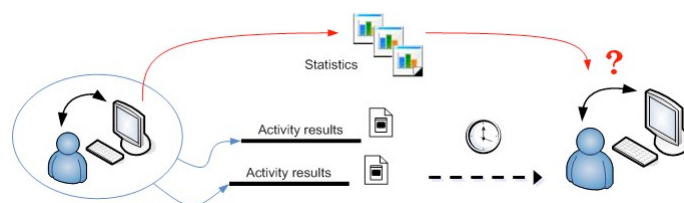- Quantitative *vs* qualitative approaches
- Trace-based approach

Reflexivity need

≡ Quantitative approach: Log-files

- To record raw machine events and find some statistics regularities and try to provide indicators to the user.
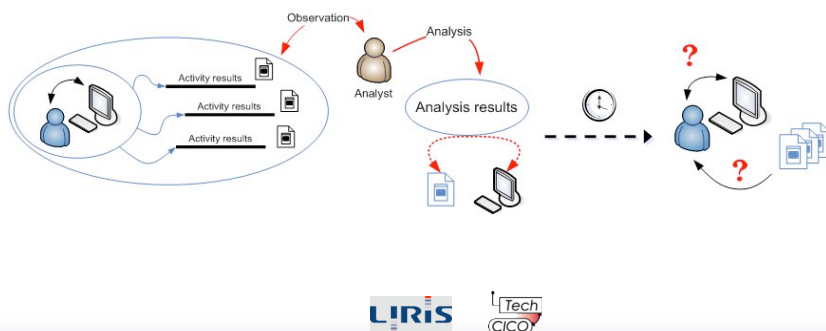- How to use global indicators in a particular task realization ?

Reflexivity need

Qualitative approach : Observation

- Observation performed by expert analyst.
- Important results with fine grain analysis but expensive and not continuous. How to gain from analysis results ?
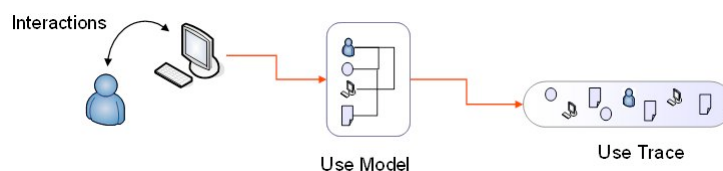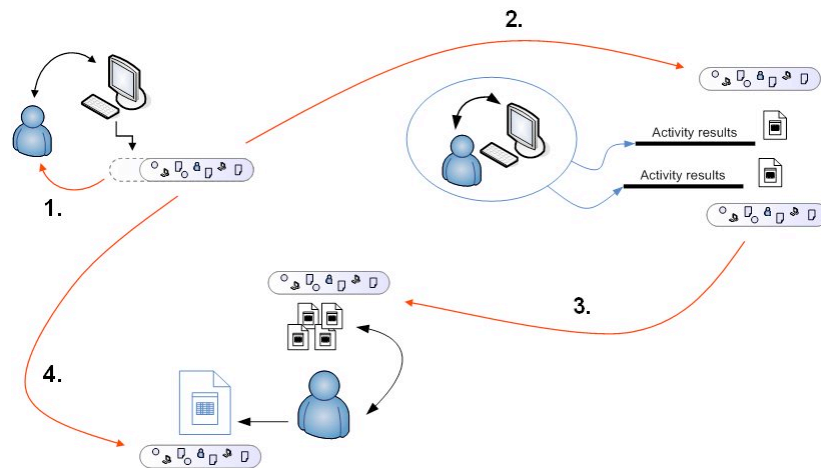
Trace based approach

Trace based approach

- We need a use trace which make sense in the involved task. We need it at a suitable abstraction level.
- The point is to create a model which defines interaction elements constituting the trace.
- The trace must be built during interaction by using this model.

Use Model   Use Trace

Trace based approach

Trace based approach

≡ **Important points**

- We propose a use trace with a <u>suitable abstraction level</u> to <u>make sense</u> for the system <u>and for the user in his task</u>.
- This trace is used to <u>provide reflexivity</u> in this task, and to allow the user being conscious of his proper experience.
- This provided support can be <u>a first step</u> in a Experience Management process.

→ What applications of trace based system can be proposed in Experience Management context ?

Applications

≡ Reflexivity and contextualization

- Each component is contextualized by the others in the trace.
- Example in a DDS: the trace can provide an access to the documents through their use.
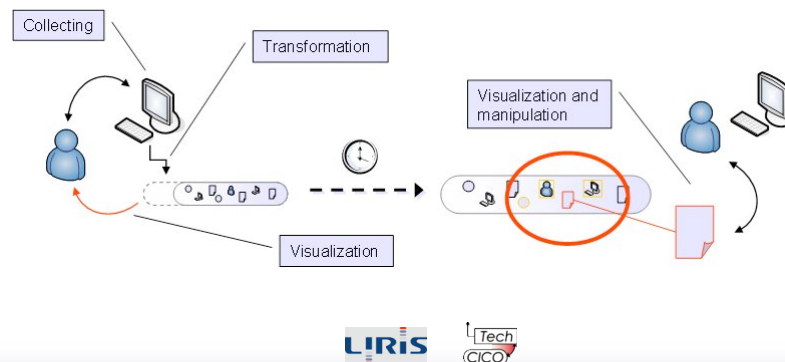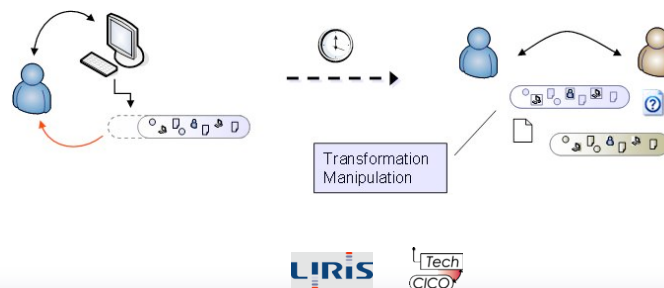

Applications

≡ Sharing experience

- The use trace is not the experience or a part of it. The trace is a support to deal with the experience of use, and firstly a mnesic support.
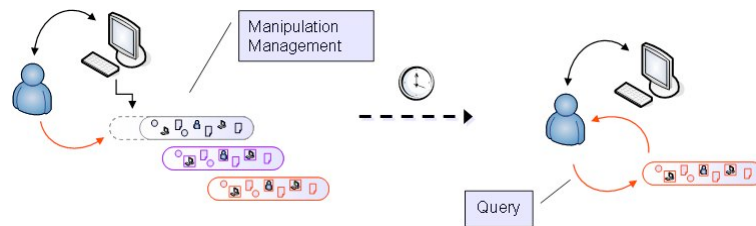- Support for sharing experience situations: memory project, formation, knowledge map …
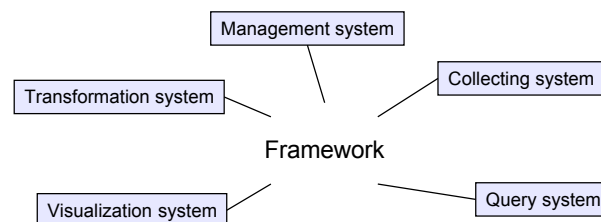
Applications

Reusing experience

- Significant episodes identified.
- Query trace base and compare to the current task.
  - The trace is not the solution, but a support in the task realization.

Manipulation Management

Query

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Framework

Generic Framework

- Various applications of Trace Based Systems (TBS).
- Need of a global framework.
  - Several systems have been identified, and can be used independently.

Management system

Collecting system

Transformation system

Framework

Visualization system

Query system

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TBS Framework

- **Collecting system**
  - Conversion of several tracing sources into a basic trace.
- **Transformation system**
  - Modify the trace by enriching or filtering by using a transformation model.
  - Modify the model of trace or update trace base.
- **Visualization system**
  - Techniques to display traces in a visual form allowing human's direct exploitation.
- **Query system**
  - To allow trace base exploitation
- **Management system**
  - To manage various models involved

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Conclusion

- **Outcome**
  - Complex tasks in DDS as a Experience Management issue.
  - Reflexivity question and use trace proposition.
  - Applications of a Trace Based System examples.
  - Presentation of a global framework for Trace Based Systems.
- **Future work**
  - Framework instantiations into various real Trace Based Systems
    - Several domains remain to be explored.
  - Visualization tools
    - To represent thick information in a narrow space.
    - To provide a support for reflexivity and interactivity with the trace.

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Thank you for your attention