Knowledge Artifacts Evolution:
A Human-centered, Community-driven, Data-based Approach

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knowledge artifacts designed and created by human being

▶ not only: software, software components, software systems

▶ but also: learning, experience, retrieved information

example domain: online e-learning

- ► e-learning and online communities
- ► different learners have different goals
- ► learners' knowledge evolution
- ► collaboration among learners
- ► collaboration between learners and content providers
- ► collaboration among content providers

tools to facilitate
knowledge artifacts evolution

► human-centered: human interactions with support tools

► community-driven: knowledge communication among members

► data-based: information clustering and multi agents

Existing Approaches for Analyzing Community Activities

Community

generalization

simplification

$$\frac{\partial x}{\partial y} = x^2 + ax + by + c$$
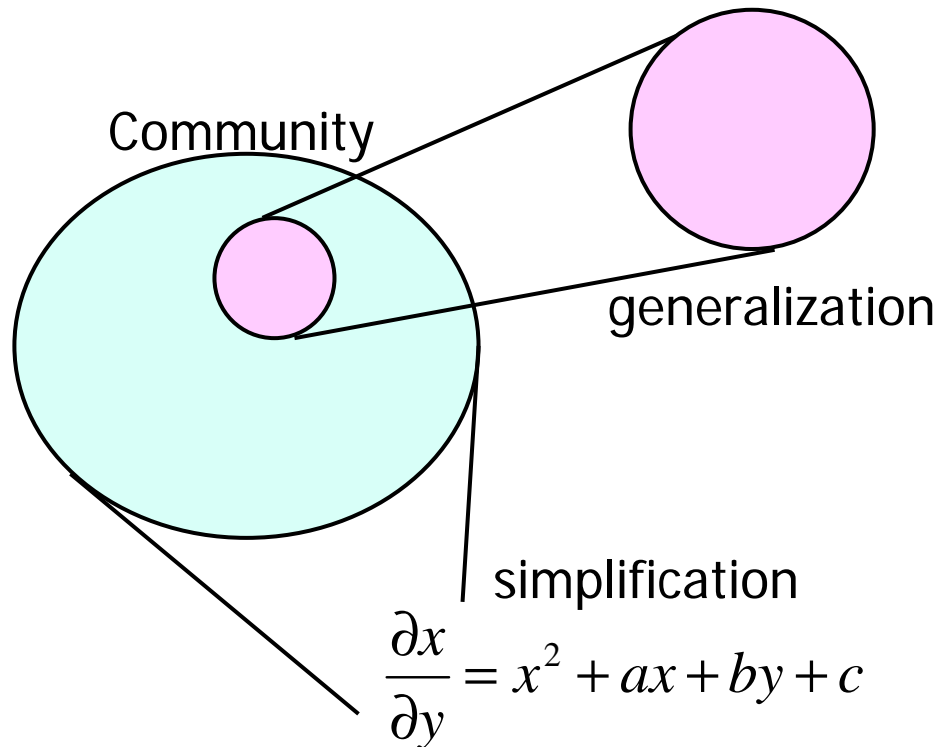
- **■** (1) "narrow" approaches: observe a tiny part of community activities and generalize the findings.

- **■** (2) "shallow" approaches: generate a simple mathematical model and simulate community activities based on the model.
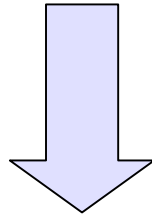
Both approaches need a pre-understanding of what to look for as a problem.
They are not adequate for uncovering emerging problems.

# Understanding Community Activities

■ In order to

- discover problems occurring in the community

- design new methods to support the community

■ We need to understand detailed activities of people in the community by analyzing

-knowledge artifacts that people create
-knowledge artifacts that people use
-the process of how people create knowledge artifacts
-the process of how people use knowledge artifacts
-interactions among the community members

UmCmModel

Multi-agent Simulation

Agent with a decision-making system which is made from the UmCmModel
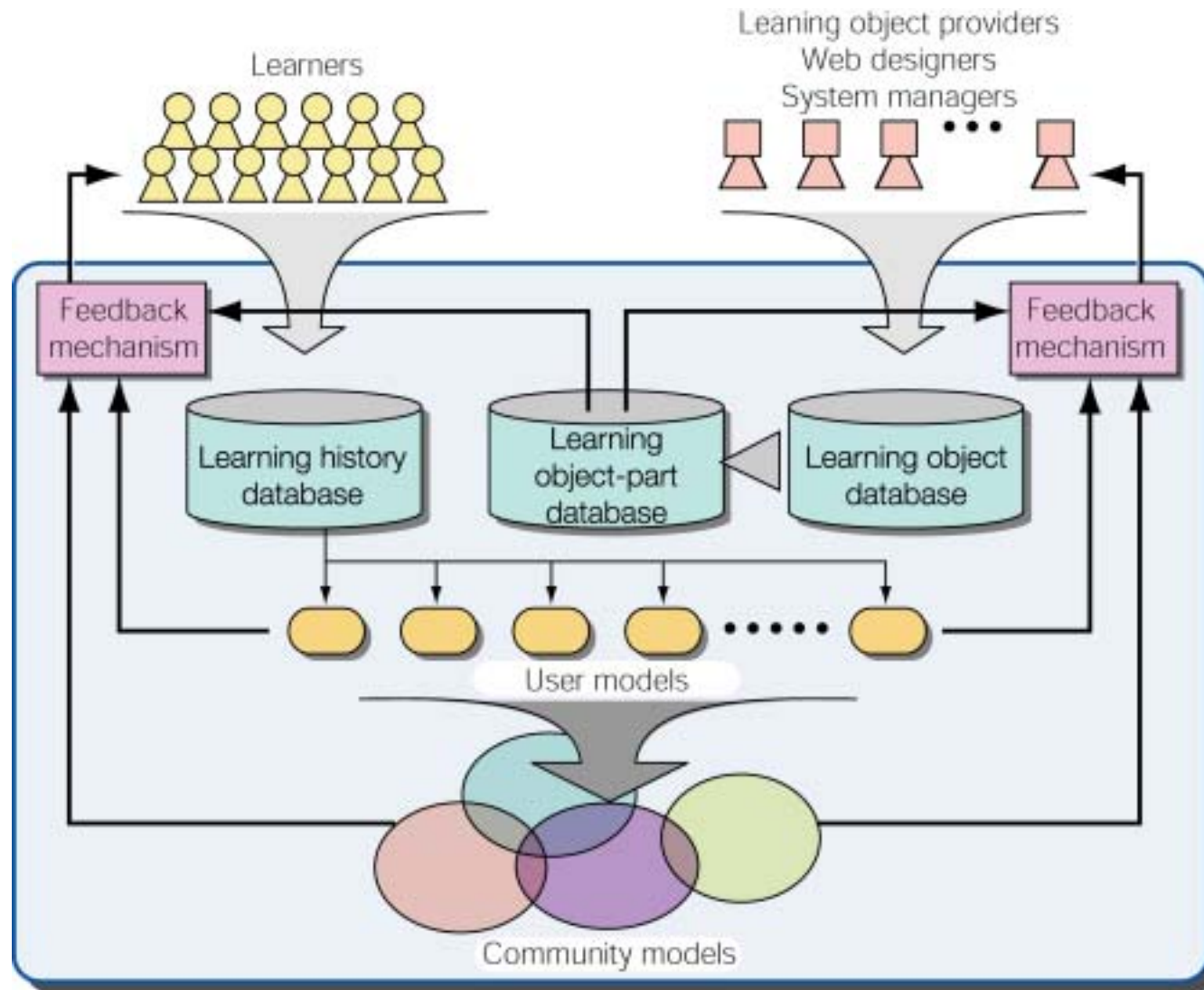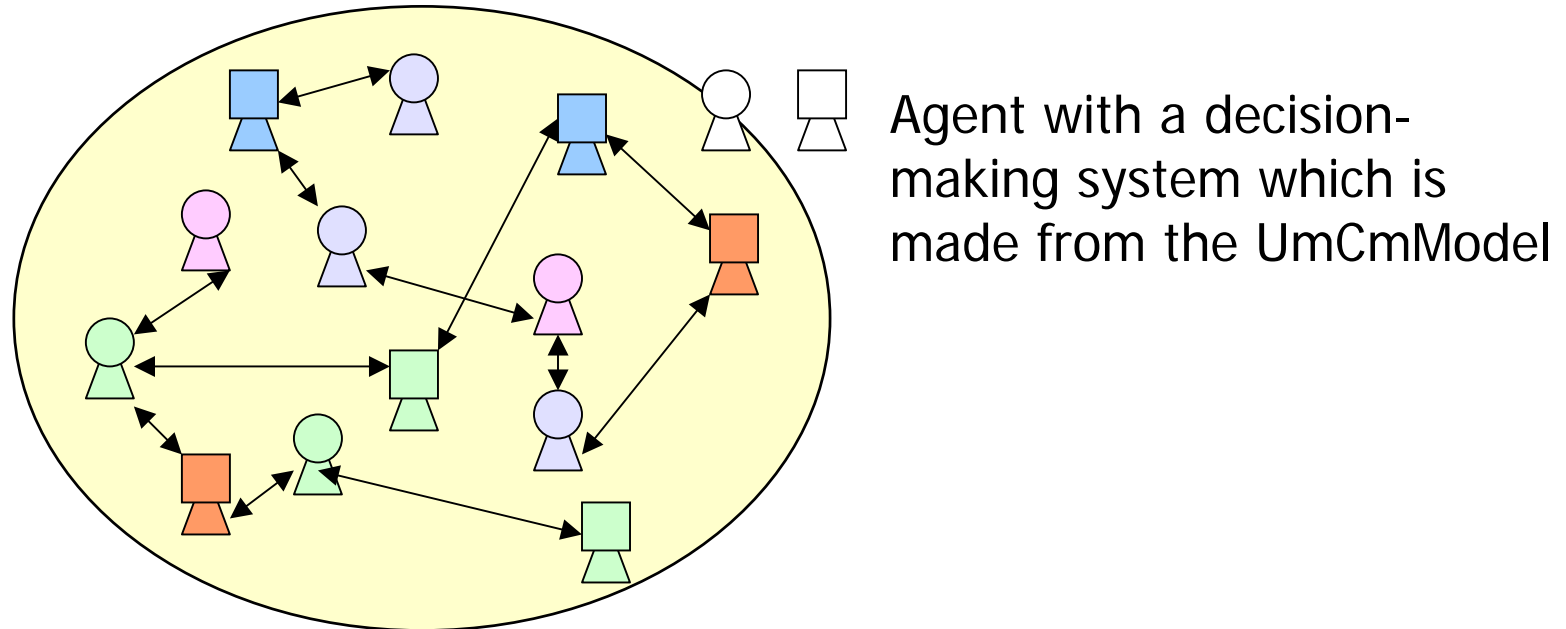
■ Multi-agent simulation environment

■ Through the multi-agent simulation, We can expect as follows;

    - Simulate what users are doing in the real world

    - Predict the users' behavior and the interactions among the users in the near future