

DYNAMO



Dynamic Architectural Memory On-line

Vocabulary

- Case-base Design (CBD)
- Case-based Reasoning (CBR)

CBR

- In case-based reasoning (CBR) systems expertise is embodied in a library of past cases, rather than being encoded in classical rules. Each case typically contains a description of the problem, plus a solution and/or the outcome. The knowledge and reasoning process used by an expert to solve the problem is not recorded, but is implicit in the solution (AIAI).

More on CBR

- Cased-based reasoning would aid in solving a new problem by using or adapting solutions or “cases” that were used to solve old problems.
- Uses Artificial Intelligence to collect and store information about past experiences.
- Modeled after the brains cognitive process of storing and retrieving information.

CBR and knowledge

- Can be abstract, generally applicable principles
- Can be concrete specific experiences (cases) (Riesbeck & Schank, 1989)
- Memory is constantly changing with each new experience (case)

Architectural Experience

- Having designed yourself
- Physically experiencing designs of others
- Second hand acquisition of knowledge thru pictures, drawings and texts about existing designs and objects

CBD

- Tool inspired by CBR
- A tool that uses the principles of CBR in its design
- DYNAMO is a CBD that uses CBR principles

What is DYNAMO

- Computer aid for architectures similar to a database but interactive and always growing
- Platform where different forms of interaction can take place and results are stored similar to our brains process of storage and retrieval
- Interactive workhouse, not a passive warehouse

DYNAMO – Goals

- Not just a memory-centered model of cognition which students mindlessly access and use.
- Nurtures the cognitive processes in the human designer's mind as it is being used
- Provides a platform for interaction and knowledge exchange between designers and designs
- Appropriate for designers at all levels

DYNAMO – why it works

- Based on the importance of concrete cases in architectural education
- Based on CBR theories that memory changes
- Free from human storage of information and retrieval error
- Uses a growing interactive database for nurturing a lifelong process of learning from existing design cases

Concrete projects in Design of objects



- Concrete cases rather than generalizations are relied upon heavily in the education of future architects

Concrete projects in Design of objects



- The particulars in a project give subjects the big picture view of the design. This would be lost if issues were taken up separately

DYNAMO and Memory



- Knowledge and insights are developed and renewed through interaction

DYNAMO supports 4 types of interaction

- Interaction between designs
- Interaction between human designer and computer
- Interaction between student designers
- Interaction between practice and education

Between Designs

- Dynamo has a core web of indices that allows retrieving and browsing between design cases (two objects). Projects are labeled with several features and linked to other projects with common characteristics

Designer and computer

Subjects not only use the web of indices to navigate thru cases in memory, but can change and improve memory by adding new projects and re-indexing as relationships between cases change.

Subject to student

- Serves as a collective external memory for the students and design teachers (Wegner, 1987)
- Gives subjects access to the design knowledge of experts outside the studio
- Has the potential to increase frequency and quality of subjects' dialogue.

Practice and Education

- Architects working in practice can draw fresh insight from student's work.
- Additions from outside practices keep students up-to-date on new problems and processes
- DYNAMO can build a bridge between education and practice

Conclusion

- DYNAMO does not perform any case-based reasoning, but does promote cognitive activity in subjects by actively developing student's design knowledge.
- DYNAMO stimulates students to learn from previous projects
- DYNAMO assures knowledge is gained in the same way it will be used

Conclusion

- DYNAMO promotes the kind of thinking that helps to learn in a better way from existing designs
- DYNAMO provides a framework for organizing knowledge much in the way the brain tries to organize information – by linking common characteristics

Implications for ID

- DYNAMO's modeling of the human brain's cognitive processes can be implemented in learning environments other than architectural design.
- DYNAMO and its affects on human processes of organizing information can be researched by Instructional Developers

References

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Wegner, D.M. (1987). Transactive Memory: A Contemporary Analysis of the Group Mind. In B. Mullen and G.R. Goethals (Eds.) Theories of Group Behavior, London: Springer Verlag, 185-208