

CBR IN CODE

REUSE

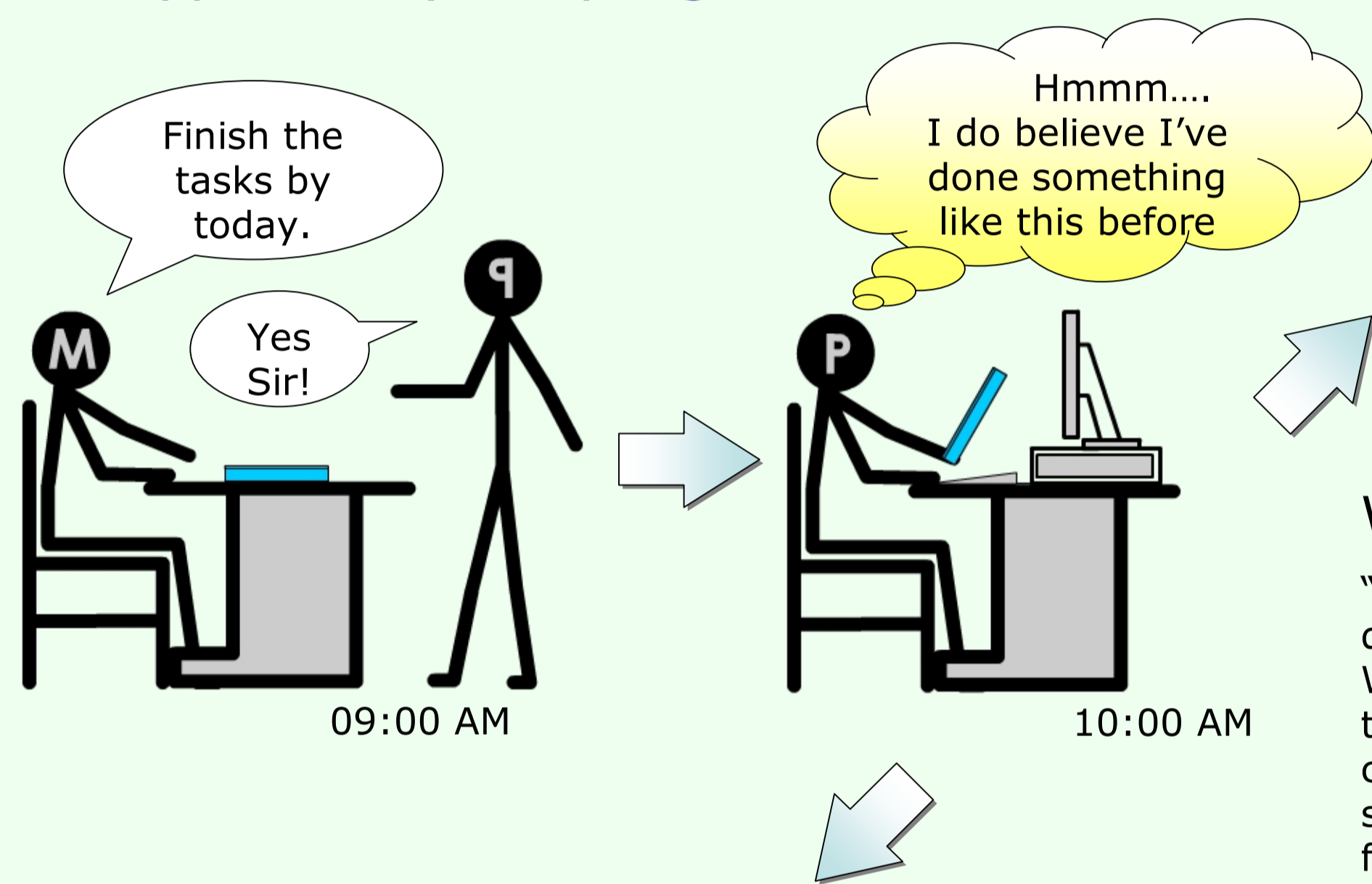
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Research Aim

Software programmers often find themselves in the situation where they knew they have a piece of code fragment that will solve the problem they are facing now, but they are unable to find it and reuse it quickly.

The purpose of this research is to allow developers reuse their previous work more efficiently through CBR tool support. This is achieved by storing code fragments into a database and apply CBR to retrieve them when required.

A typical day for programmer at office



Without CBR tool support



What is CBR?

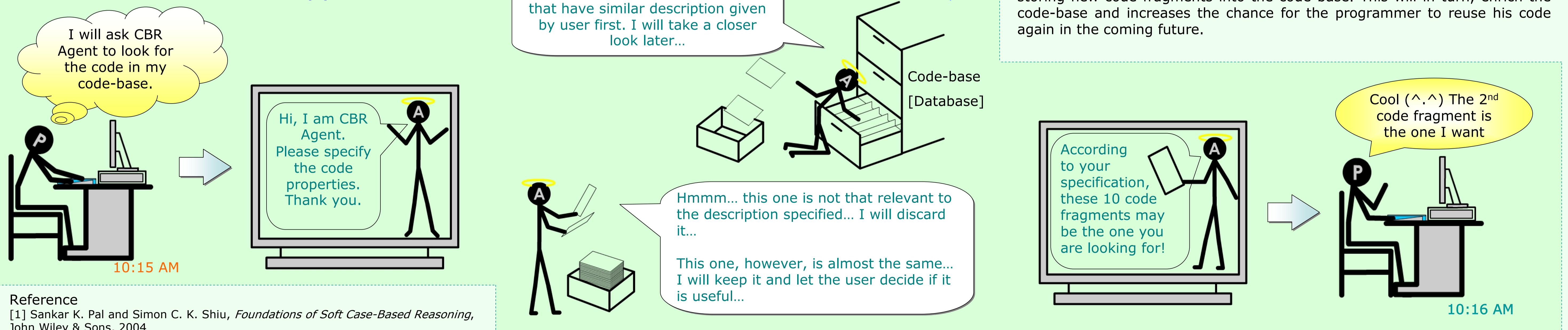
"Solving a problem using past experience" is a simple, yet sufficient definition for CBR (Case-Based Reasoning). The idea is not new at all! We employ this strategy all the time. For example, if you look closely at the title you will see that it is made from four distinct shapes. Each character is created based on past experience of how the shapes can be stacked up. In terms of this research the experience stored will be code fragments.

CBR Agent, in the diagram below, represents the process involved in retrieving past experiences. The agent will generally perform two distinct actions [1, 2]:

- >Retrieval: occurs when the agent collects all the relevant code fragments from the code-base based on user description.
- >Review: occurs after retrieval, at this stage, the agent will judge if a candidate fragment is similar to the specifications given by the user. If the candidate is very similar then the agent will keep a copy and let the user decide, otherwise the candidate will be discarded.

Apart from the two actions described above, the agent is also capable of storing new code fragments into the code-base. This will in turn, enrich the code-base and increases the chance for the programmer to reuse his code again in the coming future.

With CBR tool support



Reference
[1] Sankar K. Pal and Simon C. K. Shiu, *Foundations of Soft Case-Based Reasoning*, John Wiley & Sons, 2004
[2] C. Tautz, K-D Althoff, "Using Case-Based Reasoning for Reusing Software Knowledge", in *Proceedings of the Second International Conference on Case-Based Reasoning Research and Development*, 1997, pp. 156-165