



E/S AOA Embedded System Artifact Organization and Adaptation Framework



Doctoral Thesis : Research and Development of a Knowledge Management System (KMS) for Embedded Systems Development

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1. Objective

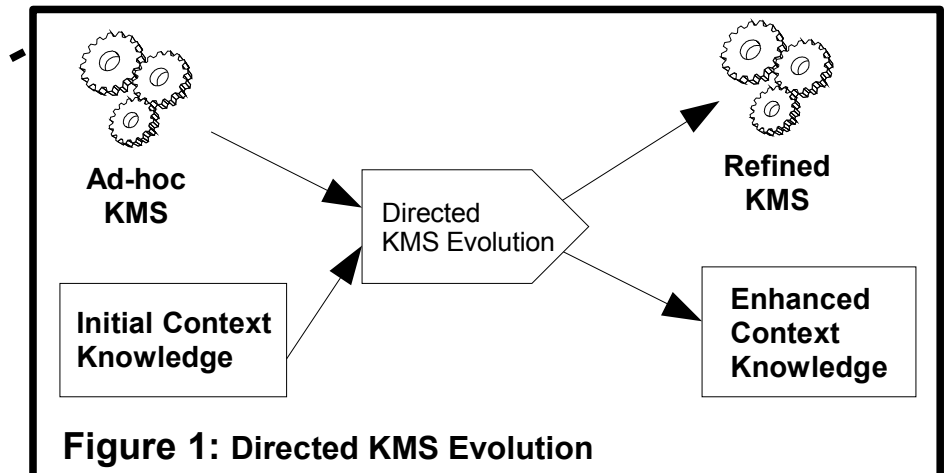
Develop a framework for evolving a knowledge management system [Drucker, 1998] for managing Artifact Organization and Adaption (AOA) knowledge, a specialized form of technical knowledge that occurs during the implementation phase [Schach, 2005] of a development project. The methodology is applied and tested in the context of developing embedded systems.

2. Terminology and Background

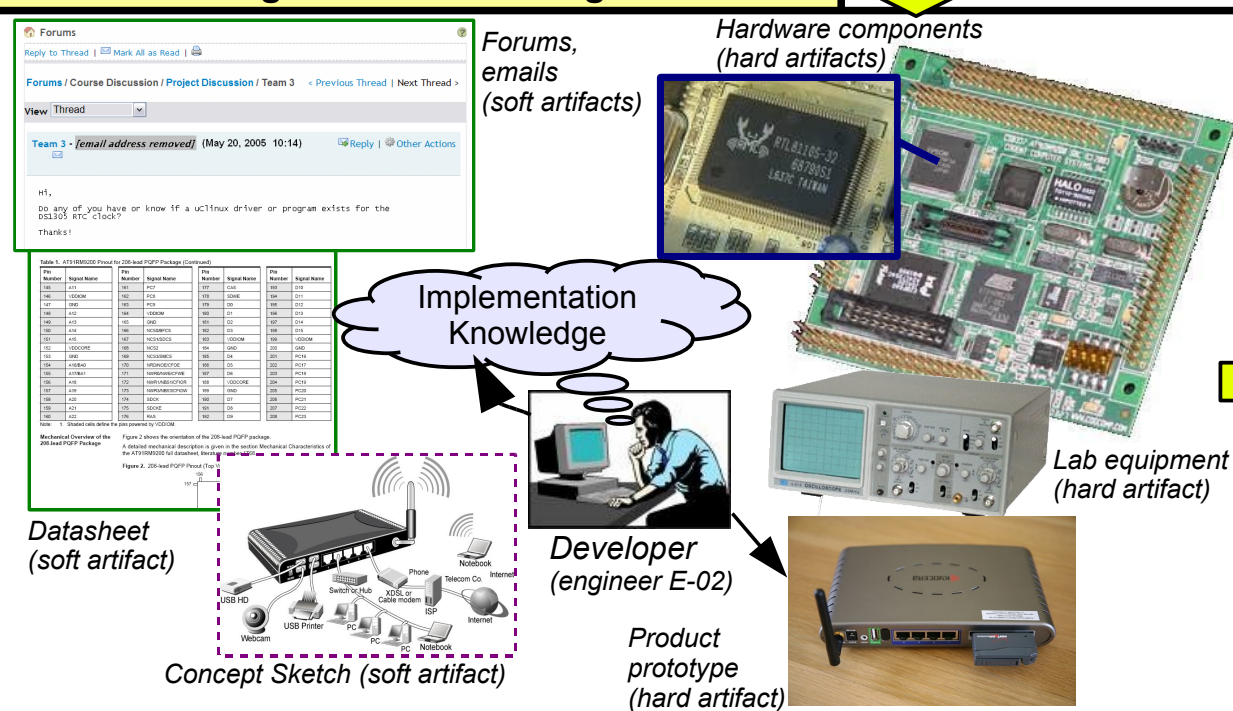
Knowledge exists in the mind of a person, and gets there through the interpretation of information [Debowski, 2006]. A knowledge management system (KMS) involves people, processes and artifacts of an organization and how these work together to support the creation, capture, storage and dissemination of knowledge in the organization [Holsapple, 2003].

3. Focus: ESAOA Activities

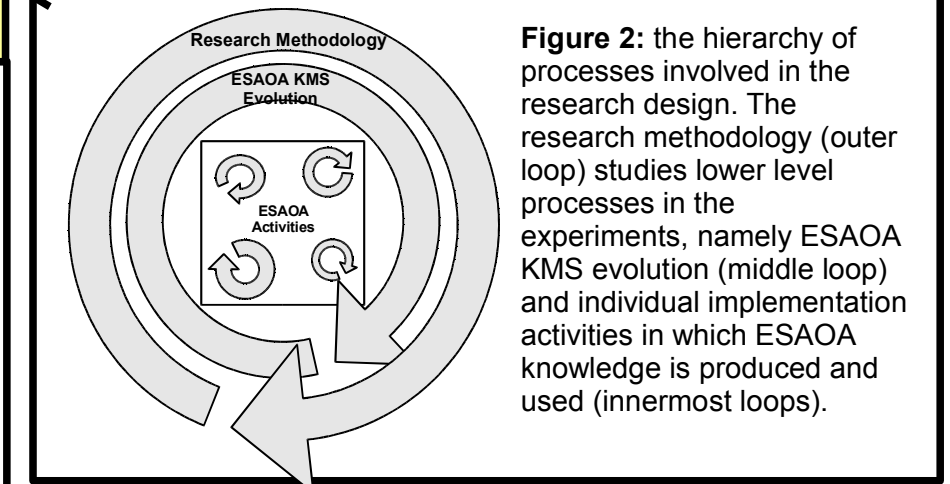
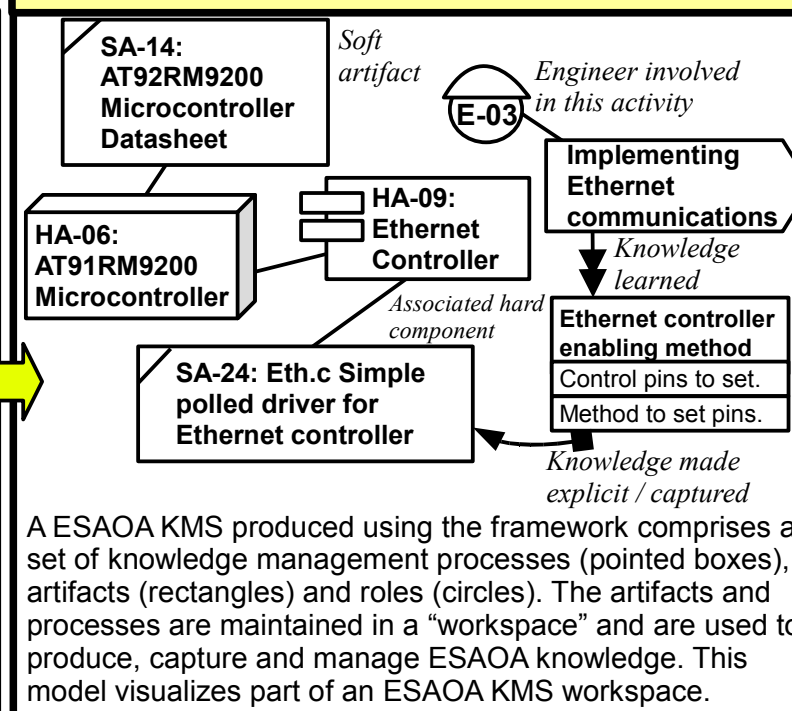
A KMS exists for any form of knowledge work (e.g. Embedded system development). This thesis focuses on moving a group of engineers from using an *ad-hoc* KMS that evolved naturally towards a refined KMS through a process of “directed KMS evolution” (See Figure 1). Knowledge management, like knowledge itself, is highly dependent on the type of knowledge work involved. Therefore, to evolve a KMS, detailed study of the knowledge work is needed, to achieve trade-offs and produce specialized knowledge management methods and tools. This project focuses on a specific form of knowledge work, referred to as embedded system artifact organization and adaptation (ESAOA) activities. These activities are closely associated to an engineer’s knowledge of development tools and product components used to construct an embedded system (see below). The research design (Figure 2) focuses on how developers organize and adapt implementation artifacts to create, capture, store, and share knowledge of product components and the use of development tools to implement a product. The results are used to improve the design of the ESAOA framework for managing embedded systems knowledge.



4. Researching ESAOA knowledge



5. Representing & evolving an ESAOA KMS



References

Drucker, P., et. al (1998) *Harvard business review on KM*, HBS Press.
Holsapple, C. (2003) *Handbook of KM*, Springer, New York, NY.
Schach, S. (2005) *Object-oriented and classical software engineering*, McGraw-Hill, Boston, MA.
Winberg, S. (2007) *Productive vs non-productive knowledge acquisition in embedded software development*. In *International journal of Software engineering and knowledge engineering*, 17(4), New Jersey.