Proposal

The Desired Features of Software Architectural Knowledge Management Tools

Zengyang Li

Software architecture plays an important role in managing the complex interactions and dependencies between stakeholders and serves as a reference artifact that can be used by stakeholders to share knowledge about the design of a system. Architecture also facilitates early analysis of the system, especially with respect to quality attributes and maintainability of the system.

In the last decade, research and industry have primarily considered a software architecture as a high level design captured in sets of components and connectors that can be represented using various viewpoints. In recent years, there has been an increasing awareness that not only the architecture design itself is important to capture, but also the knowledge pertaining to it. The so-called architectural knowledge (AK) is a set of relationships between decisions, people, architectural design, and processes. Hence, AK may contain alternative solutions, significant entities from the problem space (such as key stakeholders' concerns), technology constraints, business information, and general knowledge (such as design patterns).

Because the architectural knowledge that is both produced and consumed during the architecting activities is voluminous, broad, complex, and evolving and thus cannot be manually managed by the architect. To facilitate managing architectural knowledge, some architectural knowledge management (AKM) tools were developed for this purpose. However, there is not a consensus about what features an architecutral knowledge management tool should support.

By reviewing selected papers with regard to AKM tools, this paper summarizes a set of knowledge activities and and use cases which an ideal AKM tool should support in the architecting life-cycle. Then, we focus on the architectural knowledge sharing and illustrate seven desired properties an AKM tool should possess by considering the characteristics of architecting. Finally, we will discuss some questions about openness level of architectural knowledge and the quality of architectural knowledge and we hope this discussion will be valuable to the design and development of future AKM tools..

The field of research: software architecture
The specific focus: the desired features of AKM tools
Expected findings: the AK activities and use cases an ideal AKM tool should support; the desired properties an ideal AKM tool should have in terms of AK sharing; the openness level model of AK