

WICSA 07 Tutorial

Architecture Knowledge Management: Concepts, Technologies, Challenges

Ian Gorton Ali Babar

January 6, 2007, (Half Day – AM)

Modern software systems are typically built by acquiring and integrating various components developed by commercial or open source entities, whose teams are commonly geographically distributed. Capturing the technical knowledge, contextual information, and rationale surrounding the design decisions underpinning the system architectures and software components can greatly improve the software development process. If not managed, this critical design knowledge is implicitly embedded in the architecture, becoming tacit knowledge which erodes as personnel on the project change. Moreover, the unavailability of architecture knowledge precludes organizations from growing their architectural capabilities.

In this tutorial, we highlight the benefits and challenges in capturing and managing software architecture knowledge for supporting an architecture-centric software development process. We discuss various approaches to characterize software architecture knowledge based on the requirements of a particular domain. We describe various concepts and approaches to manage the software architecture knowledge from both management and technical perspectives. We also demonstrate the utility of captured architecture knowledge to support software architecture activities with a case study covering the use of architecture knowledge management techniques and tools in an industrial project. The specific architecture knowledge management technology used during the tutorial is BRedB, a software tool developed in National ICT Australia. Finally, the ways in which Wikis can be used to manage architecture knowledge are discussed.