

Knowledge Management Barriers: A Statistical Study of Hardware Development Engineering Teams within Restricted Environments

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Abstract : Knowledge Management (KM) is globally recognized as a crucial element in securing competitive advantage through building and maintaining organizational memory, codifying and protecting intellectual capital and business intelligence, and providing mechanisms for collaboration and innovation. KM frameworks and approaches have been developed and defined identifying critical success factors for conducting KM within numerous industries ranging from scientific to business, and for ranges of organization scales from small groups to large enterprises. However, engineering and technical teams operating within restricted environments are subject to unique barriers and KM challenges which cannot be directly treated using the approaches and tools prescribed for other industries. This research identifies barriers in conducting KM within Hardware Development Engineering (HDE) teams and statistically compares significance to barriers upholding the four KM pillars of organization, technology, leadership, and learning for HDE teams. HDE teams suffer from restrictions in knowledge sharing (KS) due to classification of information (national security risks), customer proprietary restrictions (non-disclosure agreement execution for designs), types of knowledge, complexity of knowledge to be shared, and knowledge seeker expertise. As KM evolved leveraging information technology (IT) and web-based tools and approaches from Web 1.0 to Enterprise 2.0, KM may also seek to leverage emergent tools and analytics including expert locators and hybrid recommender systems to enable KS across barriers of the technical teams. The research will test hypothesis statistically evaluating if KM barriers for HDE teams affect the general set of expected benefits of a KM System identified through previous research. If correlations may be identified, then generalizations of success factors and approaches may also be garnered for HDE teams. Expert elicitation will be conducted using a questionnaire hosted on the internet and delivered to a panel of experts including engineering managers, principal and lead engineers, senior systems engineers, and knowledge management experts. The feedback to the questionnaire will be processed using analysis of variance (ANOVA) to identify and rank statistically significant barriers of HDE teams within the four KM pillars. Subsequently, KM approaches will be recommended for upholding the KM pillars within restricted environments of HDE teams.

Keywords : engineering management, knowledge barriers, knowledge management, knowledge sharing

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