

Chapter 14

A Closer Look at Concept Map Collaborative Creation in Product Lifecycle Management

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ABSTRACT

One of the greatest challenges of effectively managing knowledge in an organization is promoting seamless connections of operations between departments. Historically, information systems supporting operations have been developed with a specific department's culture in background. Therefore, connecting data, information systems, and people across the product lifecycle is an ongoing puzzle for organizations. Theorists and practitioners agree on the need to include employees' expertise and vision in this process. This chapter explores a tacit knowledge capture tool and a methodology to use it as a means to voice the interaction and negotiation among employees to support KM and IT strategy and development choices. Concept maps collaborative creation can provide a usability tool focused on meaning throughout the product lifecycle. A literature review of the challenges involved and of the proposed tool is presented, followed by a use case and the methodology for the concept map collaborative creation session, concluded with recommendations drawn from theory and practice.

INTRODUCTION

Product Lifecycle Management (PLM) aims to connect all the steps of creation, development and commercialization of a product. Businesses expect that the adoption of product lifecycle management translates into an increase in connectivity among the different departments involved, less faulty items and more rapid implementation of procedural changes, among other benefits. The implementation of the product lifecycle management paradigm requires the identification of the contact points among the existing departments, the impact of the deliverables generated by a team on the work of other teams and the knowledge of the data and information systems serving and being used by each department. As classification is a natural human reflex to understand the world, classifications focusing on each one of the developmental steps may already exist within the organization. These classifications might, however, reflect the thought paradigm that is particular to the department for which it was developed. Including existing classifications in the PLM effort would therefore have the benefit of creating a common perception of the whole product lifecycle, or at least of the common points among teams.

Before the implementation of a PLM initiative in an organization, the connections among departments, if they exist, happen in an informal way that is not supported by information systems. They are often poorly documented in policies or procedures. Informal collaboration implies the use of tacit knowledge such as knowledge about the common points and areas among departments, the organizational culture, and also refers to having personal contacts in other teams and having problem resolution capacity, among other elements. In that sense, a certain connectivity among departments or, at least, a certain knowledge of what is missing to create that connectivity already exists before the implementation of the product lifecycle management paradigm, even though this may not be documented. This connectivity, as well as the knowledge of the challenges in creating a more structured environment for this connectivity, is lost when the employees that hold them quit the organization. The preservation and use of this tacit knowledge has the potential to ensure the PLM transition is adapted to the reality of the organization.

Converting all this tacit knowledge into explicit knowledge is expensive and sometimes not even possible. Explicit knowledge requires the use of language and logic, which invariably leads to a reduction in the multifaceted nature of tacit knowledge. Modeling the interaction between tacit and explicit knowledge will however require some level codification of tacit knowledge. The challenge is to represent tacit knowledge in a fashion that is clear enough to lend itself to modeling without actually converting all of this tacit knowledge into explicit knowledge.

The term “tacit knowledge” refers to knowledge that has not been expressed in any kind of language (Nonaka & Takeuchi, 1995). “Explicit knowledge” addresses the knowledge that has been articulated to the extent that it can be understood without needing direct access to the holder of that knowledge. Consider a continuum of media that hold knowledge. Human minds would be on one extreme whereas documents would be on the other. The knowledge that resides in human minds is named tacit knowledge. To be codified, knowledge has to be exteriorized (made explicit) to some level, one that makes it possible to use natural language. The knowledge that was exteriorized to the level needed for codification allows for a more or less complete understanding of the topic without the need to talk to the original holder of the tacit knowledge. This study explores a medium that is between human minds and documents, a medium that requires a less difficult exteriorization process. This medium offers a range of possible meanings but depends on the original holder of the tacit knowledge to be fully understood. The somewhat exteriorized knowledge cannot be said to be explicit, as it is not independent from the tacit knowledge at its origins. It is therefore named “captured” tacit knowledge, to convey the meaning of an incomplete

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