

A Collaborative Methodology for Tacit Knowledge Management-Application to Scientific Research: A Critique Paper

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Abstract—The location of tacit knowledge is inside of the human brain. It is correlated with the understanding, skills, and experience of someone. Tacit knowledge usually unstructured, not have a formal language, it is very difficult to understand, transfer, and represented that to the public. This knowledge is generally not documented because it is still there on the expertise or personal experiences of someone. The critique will discuss about collaborative methodology for tacit knowledge management in application to scientific research, which is written by Mezghani, Exposito, and Drira. In the paper which criticized, proposed a generic two step methodology that will overcome human barriers when capturing the domain expert. The aim is for formalize a scientific knowledge research in context of network and communication field based on generated ontology.

Index Terms—Tacit knowledge management, collaborative methodologies, human barriers, domain expert, generated ontology.

I. INTRODUCTION

In case of knowledge management, there is a lot of kind of knowledge that we can find and elaborate. This kind of knowledge can be used in organization and research purposes. All of the knowledge can we call as “treasure” to maintain a effectiveness and efficiency to optimize organization and research condition. One of the kinds of knowledge that can be used is tacit knowledge.

Actually, the “location” of tacit knowledge is inside of the human brain. It is correlated with the understanding, skills, and experience of someone. Tacit knowledge usually unstructured, not have a formal language, it is very difficult to understand, transfer, and represented that to the public. This knowledge is generally not documented because this knowledge is still there on the expertise or personal experiences of someone.

This leads to paper titled “A Collaborative Methodology for Tacit Knowledge Management-Application to Scientific Research” by Emna Mezghani, Ernesto Exposito, and Khalil Drira, a paper which criticized. It proposed a two steps methodology that will overcome human barriers when capturing the domain expert. The aim is for formalize a scientific knowledge research in context of network and communication field based on generated ontology [1].

There are a lot of things that we must give more attention when we use collaborative methodology for tacit knowledge management. Such as, condition, availability, and the relevancy significance of the tacit knowledge resources, correlated with the needs and requirements of research and organization. In addition with the human barriers, researchers must clearly represent it clearly. Whether in resource of the

tacit knowledge itself, or whether there are other external factors that affect a situation, so researchers decide that as human barriers.

II. SUMAARY

Scientific research knowledge team such as articles, internal team reports, figures, tables, and video representing demonstration embedded in unstructured documents. Knowledge as the important thing to be capture, must been encapsulated, so the research team can cultivate it as knowledge base. It means, the knowledge treasure of research team overspread in every research aspect and not well documented. When team will collect the knowledge, also increase time consuming, energy, even cost overruns. In addition, an human barriers also predispose and hamper when extracting and sharing the expert tacit knowledge. To cover that problem in scientific research, collaborative methodology for tacit knowledge management-application to scientific research proposed [1].

The methodology is based on top down approach which is mainly composed on two steps. The first step is knowledge organization. This step is corresponds to conceptualizing and representing the knowledge in an appropriate format. Second step is knowledge acquisition and reuse, allows the users collaboratively producing and consuming the knowledge [2] [3]. The output from this collaborative activity is to a make a Core Reference Technology (CRO) to describing generic concept and relation based on formalized requirements. Furthermore, specializes these concepts to reflect domain expert skills and knowledge repose their collaboration, and generates Domain Specific Ontology (DSO). The main contribution of this methodology is to avoid conflicts and human barriers related to the personality characteristics when communicating with experts. The proposed methodology inspired from incremental approach, where the knowledge structure divided into part-part step, such as:

- Expert divided into groups. Each group includes experts working on the same research area [4].
- For each group, individual meetings with each expert are organized to discuss with him/her, to formalize his/her vision and to acquire as much as possible knowledge about his/her works [5].

By this way, problems such as being influenced by colleagues high in extraversion, and avoiding conflicts with colleagues high in neuroticism are covered. Furthermore, according to the expert character, different methods and questions are adopted to extract his/her knowledge. For example, the knowledge engineer reviews some relevant publications of the expert and extracts a set of keywords that help animating the discussion in order to deal with problems pertaining to people less in agreeableness or less in extraversion.

The CRO is used when discussing with experts to converge to a unified model. By repeating the processes, different

models are generated. Afterward, for each group, the different versions are aggregated provide a unified ontology schema which is approved and validated by the experts of this group. The final versions of all the groups are integrated in order to generate the Domain Specific Ontology (DSO) that reflects the team directions and interests, and formalizes its experts' visions during the design process.

Especially, the authors work planning depend on semantic web technology then supply a user friendly interface that allow collaborative authoring and annotation between team member. It is a nature of virtual knowledge intermediary that be related team knowledge in a method that can be easily reused.

A. Use Case Application: Scientific Research Management.

At this step, Authors recognize the scientific research activates core ontology (SRACO) that figure the common concepts related to the scientific research management independent from the team needs. Then, frame the SARA research team skills and expertise in the context network and communication domain. Inference of use this methodology is the network and communication research domain ontology (NCRDO).

B. Evaluation.

Furthermore, to evaluate the efficiency of the proposed methodology, authors raised a proof of concept implementing, The Network and Communication Research Domain Ontology (NCRDO). Proposed methodology presume into reckoning human barriers and use multilevel oncoming to inflict core ontology describing prevalent concept, and domain specific ontology portraying the expert skills. Semantic web platform used to manage team experts tacit knowledge, and future work will focus on the knowledge maintenance and reasoning.

III. CRITIQUE

According to paper which criticized, authors claim that tacit knowledge can be shared by communicating in team members each other. Actually, tacit knowledge can be shared to other team members in another way.

Such as, give the systematic and analytic overview of the knowledge sharing mechanisms in the project teams, give a summary of the selected articles of knowledge that members have, exploring some primary challenges in the field of the knowledge sharing in project teams and presenting the guidelines to face the existing challenges, outlining the key areas where future research can improve the function of knowledge sharing in teams [6].

The authors claim can make formal scientific research knowledge in the context of network and communication research field with their methodology. It would be better if authors give a clear parameter/indicator or a comparison between non-formal and formal scientific research knowledge. If authors make that, can give a clear explanation about what is formal scientific research knowledge, because tacit knowledge (knowledge that been a focus in research) is seldom to be classified as formal or non-formal knowledge. It is very difficult to make a classified of tacit knowledge if the aspect is about formal or non-formal knowledge.

About human barriers that authors claim. There is no deep explanation what is a human barriers in event of sharing a tacit knowledge. Authors only claim is truism that each person has his/her specific character and manners to communicate and express his/her knowledge. Studies in psychology have shown

that knowledge sharing behavior among individuals is influenced by personality traits.

In addition, to avoid barriers related to social and psychological dimensions, authors claim that the methodology adopts an incremental approach in which the identification of the knowledge structure is decomposed into sub-steps. The problem is, what is guarantee that incremental approach can overcome to avoid that barriers. It would be better if authors give a comparison about effectively approach to avoid barriers, in incremental or in non-incremental approach, the will prove that incremental approach is the best approach to avoid barriers related to social and psychological dimensions.

About the divided an expert in groups, each group includes experts working on the same research area. Then, for each group, individual meetings with each expert are organized to discuss with him/her, to formalize his/her vision and to acquire as much as possible knowledge about his/her works.

It means, when doing this activity, research team must ascertain all of the team member specialization, needs, requirements, and readability. The aim is to make a right decision divided groups, where expert can be harmonious with all of the members in that divided groups. So when discuss is obtain, there is a comfortable between all member.

Authors presented the result of applying this methodology for managing the scientific research activities and developed a semantic web platform to manage team expert tacit knowledge. The proposed methodology has been evaluated based on user feedbacks and their quality of experience.

It means, focus of the tacit knowledge is on the expert. Actually, if the focus is the expert, maybe members can give their tacit knowledge by the knowledge capturing system. Its can elimination the first step where member must discuss with expert then expert will make a conclusion for that. But with knowledge capturing system, knowledge from member encapsulated via system, then expert will formulate that as core reference ontology, it can save a lot of time. Also provide the documentation process more easily and valid.

IV. CONCLUSION

At the paper which criticized, combine several methodologies to capture the expert tacit knowledge. It is very complex and covering various aspects of a research team domain such as, the members, resources, condition of knowledge resources, and all of aspect that can influence the result of every step need to be done. It means, for the feedback and suggestion, when do the collaborative methodologies, all of the aspect must do well and appropriately. For the first step, it can be done more easily if the member can collect their tacit knowledge just by the system. Also the paper which criticized claim that their future work is will focus on the knowledge maintenance and reasoning. But if author can make a documentation in every step that proposed, it will help about the maintenance issues, and for the reasoning, focus of the research can do in each members of research team.

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