JAIST Repository
https://dspace.jaist.ac.jp/

Title	Creativity Assistants and Social Influences in KJ-Method Creativity Support Groupware
Author(s)	VIRIYAYUDHAKORN, Kobkrit
Citation	
Issue Date	2013-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/11339
Rights	
Description	Supervisor:Susumu Kunifuji, 知識科学研究科, 博士

JAIST
JAPAN
ADVANCED INSTITUTE OF
SCIENCE AND TECHNOLOGY

Japan Advanced Institute of Science and Technology

Abstract

Creativity support groupware is a multidisciplinary endeavor that is the combination and the intersection of the fields of creativity support system and computer-supported cooperative work. The goal of creativity support groupware is to understand and construct an efficient groupware that to maximize the creative power of a group of users through the excellent groupware design and the various creativity promoting techniques.

With the popularity and excellence of the KJ-Method creativity technique, we developed the “Gugeek” KJ-Method creativity support groupware for enabling people who live in a different place and have different available time to perform group KJ-Method activities on the largest computer network nowadays, the Internet. The Gugeek is a Web application developed by JavaScript and modern Web development technology which allows to be easily accessed from any personal computers and mobile phones. Gugeek can store and organize the discovered ideas and can guide the group of users to thinking systematically by following the framework workflow of the KJ-Method creativity technique. For pursuing to the next level of support, the Gugeek groupware enhances the team creativity performance by using various creativity assistant modules in both divergent and convergent thinkings.

Creativity assistants proposed in this dissertation support user in the generative level, which can automatically suggest users some relevant information to promote the creative thinking performance of users. Creativity assistants read all information about problem topic from the input information (the previous discovered ideas) and external knowledge-base, compute for generating helpful suggestions, and show them to user on the groupware’s screen.

For enhancing the divergent thinking capability of a user, we proposed a divergent thinking assistant modules based on the associative search engine GETA queried through the Wikipedia knowledge-base. The GETA can dynamically computed for discovering relevant information associated with the problem topic. We found that the proposed divergent thinking assistant modules can promote the idea association performance in divergent thinking around 34% in the number of useful idea, and can improve the number of perspective and the number of original idea around 19%.

We also proposed a novel technique for enhancing the convergent thinking capability of a user as well, an automatic category naming based on the knowledge-based automatic topic identification on the general ontology such as the YAGO and Wordnet ontologies are proposed. Given an untitled category in a KJ-Chart, the knowledge-based automatic topic identification computationally select a concept in these ontologies that most covers all concepts in that category with the highest specificity as a title of that category. We found that using our proposed method and the existing topic selection techniques can automatically predict the category title of the untitled group of labels around 44% and 49% for noun and verb topics respectively.

Another perspective that affects to the efficiency of the proposed KJ-Method groupware is the social influences among team members during the groupware use. Since they have a strong impact to the team creativity, they should be also carefully considered. In this dissertation, the two major social factors that are team communication method and team characteristic are focused. The team communication method is a way to communicate among team members. It is intensively used during the team discussion. The team characteristics are a trait of a team derived from characteristics of individual members. They are basis of team creativity and team collaboration.

For the team communication, we found that the proposed chart interaction method, which is an unique way to communicate among team members via the Gugeek creativity support groupware, is the most suitable method for the KJ-Method creativity support groupware since it promotes the team creativity most compared to others. We also performed the experiments to understand the formation of team members that contribute to the team characteristics to yields the highest team creativity. We discovered specific rules and patterns in selecting team members for building a creative team that maximize the highest team creativity performance during the groupware use.

According to these discovered knowledges, the efficiency of KJ-Method creativity support groupware can improve dramatically by the creativity assistant modules and the excellent groupware design that induces positive social influences to the team creativity. The high performance KJ-Method creativity support groupware with generative support modules can significantly promote the creative thinking capability regardless problem topics and problem complexities with the helps of high-performance computers. It can promote the creative thinking processes of all human users, which can significantly accelerate the innovative and scientific advancements for all humankind in near future.