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The Design of Group Distributed Brainstorming System by Spatial Arrangement of Ideas

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Groupware is expanding its focusing area from improvement of efficiency of cooperative works to support of creative activities, and creativity support systems are expected to become the first embodiment of it.

Human creativity's processing model is divided into four phases of divergent thinking, convergent thinking, idea solidification and evaluation. Among them, divergent thinking is the phase to clarify the problem and collect related information. Many conventional methods have developed in this research area. Brainstorming is one of the most major methods of group idea generation, following four rules of prohibition from criticizing, respect of quantity of ideas than quality, unrestricted thinking and encouragement of combination.

In this thesis, we propose a distributed brainstorming system, "Idea Canvas." This system has two features, those are a diagrammatic interface and a mutual information presentation system. Each member of group can input and arrange his (her) ideas spatially on the diagrammatic interface, on which the member can reflect the flow of thinking freely. Spatial structure analysis engine in the mutual information presentation system analyses the arrangement of the user's ideas and extract a group of related ideas. Extracted the group of ideas will be sent to the other users' diagrammatic interface through a information server by the function of the mutual information presentation system.

We also made a preceding experiment to verify effects and usage of the diagrammatic interface in this research and confirmed that users of the diagrammatic interface usually compose clusters by put subjectively related ideas closely. Based on the result, we

designed the mutual information presentation system with the spatial structure analysis engine by extraction of clusters. Following them, we made a evaluation of the implemented IdeaCanvas system and confirmed the effect of the mutual information presentation system to promote the user's divergent thinking and decrement of the mental difference in asynchronous use.