

# **Input Information Complexity and Information Processing in GSS-based Virtual Work Groups: An Experimental Investigation**

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## **Extended Abstract**

The issue of information overload in individual decision making has received considerable attention in prior research. Cognitive processing limitations shape the way in which individuals process information and deal with information complexity, particularly in information overload conditions. Surprisingly, information overload has received little attention in GSS research. In addition to the raw data available for decision making, GSS teams have deal with additional information generated by the group in the course of its deliberation, suggesting that GSS groups are more prone to information overload conditions. The literature on information overload in individual decision making suggests that as the decision maker becomes overwhelmed by the amount and complexity of information received, he or she starts to ignore some of the information and works with only a subset of the information available. This is manifest as an inverted U-shaped curve describing the relationship between information processing and information complexity, wherein the individual initially process more information as the complexity increases, but after cognitive process limits are reached, the level of processing starts to dip. This paper seeks to examine whether a similar pattern applies in the group decision making context, i.e. do groups initially respond with greater processing as the input volume and complexity increase, and then start to be more selective when overload conditions are attained? Further, if appropriate decision aids are made available to the group, is the processing ability enhanced, such that the information overload conditions occur at higher levels of information complexity?

This paper attempts to answer these two questions. Relevant literature in information processing limitations in light of input complexity is reviewed. Based on these theories, two propositions are formulated to address the questions. A study involving 54 teams performing a group decision making task involving cognitive conflict was conducted. Half of these groups had access to a decision making aid that was expected to enhance their ability to process information. Information complexity was operationalized in two ways – information volume (representing the total information content accessed during the decision making setting), and information diversity (representing the number of unique pieces of information accessed as a fraction of the unique pieces of information available). Information processing was also operationalized using two measures – information flow, and decision time.

The results indicate that information overload conditions are experienced by groups involved in cognitive conflict tasks. Information volume as a measure of information complexity exhibited the classic inverted U-shaped curve, using both decision time and information flow as indicators of information processing. When information diversity was used as a measure for information complexity, the support was mixed, with the expected relationship found only in the case of information flow. The study also showed that the use of a decision aid alleviated the overload, permitting groups to process larger and more complex information. The results indicate that the groups using the schema had increased information processing capability, at least in some cases. More importantly, in many cases, the nature of the relationship between information complexity and information processing capability was reversed between the control and the experimental groups. This strongly suggests that the presence of appropriate decision aids can improve the ability to process information. It is expected that the ability to process additional information will have an impact on decision quality. Likewise, an evaluation of different decision schema, as appropriate to the task at hand, represents additional areas for research. The initial results of the study are promising and provide a basis for future exploratory research.