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Methodology and Theory Building in MIS Research

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Abstract

This paper reports on the stage of maturity of MIS research according to the McGrath (1979) model, as evidenced by the theory building occurring in two top MIS research journals. While MIS as a discipline continues to grow, its development depends on establishing a cumulative tradition of good research (Keen 1980). Of the published papers surveyed that are relevant to theory building, 81% of them relate to theory development, while 18% address theory testing. Of the papers involving data collection, more than half use field studies as the methodology. In order to advance MIS as a mature field, it is hoped that MIS researchers consider these findings when developing future research agendas.

Introduction

The purpose of this paper is to report the stage of maturity of MIS research, as evidenced by the theory building occurring in two top MIS research journals. It reports on where MIS research, as published in two top journals, resides along a logical path for programmatic research (McGrath, 1979). McGrath considers an ideal approach to programmatic research as comprising a five-stage process and a variety of data collection techniques (see Figure 1). The focus of the earlier stages is on theory development whereas that of the latter stages is on theory validation. As research progresses through the stages, more precise information becomes known. Model formulation and manipulation occur throughout the process until finally, field studies verify the model in the 'real' world. The choice of data collection methods is contingent upon their availability and cost. Each method has advantages and limitations which should be considered rationally before embarking on a stream of research. As not all of the published papers surveyed involved data collection (e.g., concept papers), we have added a "conceptual/other" category to the McGrath model. This category includes papers that discuss concepts and those that evaluate tools for accomplishing MIS research. Figure 1 presents this revised model. Figure 1 also shows the percentage of articles that reside in each stage of the McGrath model, and that use each of the four data collection techniques or fall in the "Conceptual/Other" category.

Figure 1 Enhanced Diagram of a Five-Stage Logical Path for Programmatic Research (Adapted from McGrath 1979). (Percentages reflect survey results.)

Methodology

For the years 1993 through 1997, each of the articles in the MIS Quarterly (MISQ) and Information Systems Research (ISR) journals, including research notes, was reviewed by two researchers. A total of 210 articles were reviewed – 113 from MISQ and 97 from ISR. These articles were classified for 'stage' and data collection technique according to McGrath's Five-Stage model. This approach was carried out to assess the level of maturity of MIS research. Both MISQ and ISR were chosen for this study as they have consistently ranked as top outlets for MIS research (Hardgrave and Walstrom 1997, Im et al. 1998, Trower 1995).

While McGrath (1979) suggests that the data collection methods and the stages of programmatic research tend to correspond as represented in Figure 1, it is not necessary that they do. This flexibility allowed an element of subjectivity to enter into the analysis. For example, if an article
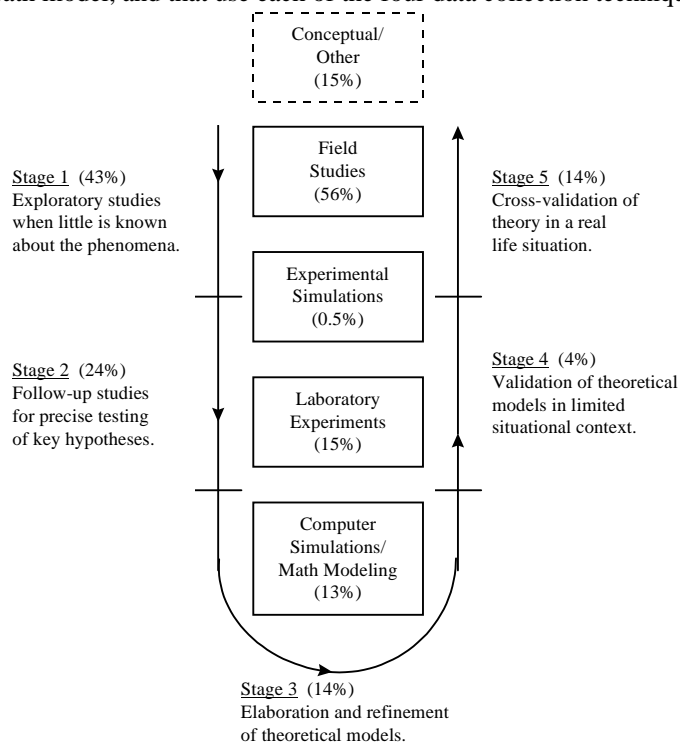
was a field study that tested hypotheses developed by observation and not from an established theory, it was classified as Stage 2. A strict interpretation of Figure 1 considers field studies to fall in either Stage 1 or Stage 5.

Stage 1 and 2 research differs from Stage 4 and 5 research in their objective. The intent of Stage 1 and 2 research is to explain a phenomenon or to propose a theory, whereas Stage 4 and 5 research attempts to validate a theory. An article was classified as 'Stage 1' if it was considered an exploratory study. With an increased understanding of the phenomena gained from the study, key hypotheses may be developed. For purposes of this study, field studies that describe an information systems development or use are considered Stage 1 research. Stage 2 articles required a presentation and testing of hypotheses, developed in the article or previously developed, that were not directly derived from established theory. In both Stage 1 and 2 research, the investigators may impose some theory as they select or measure variables (McGrath 1979, p.18). However, they do not directly assess the validity of a theory. Stage 3 required the presentation of a theoretical model either based on original or previous work. Although textual and mathematical model refinement are both classified as Stage 3, those articles tended to have a higher mathematical representation. Stage 4 articles required a test of hypotheses based on a clearly identified theory, such as Media Richness Theory. Stage 4 articles were typically conducted in an experimental environment. Stage 5 articles also required a test of hypotheses based on a clearly identified theory. The data collection method distinguished Stage 4 from Stage 5 articles. Stage 5 articles apply an established theory (validated previously in a laboratory) to a field setting. Many of these articles applied theories directly from reference disciplines and tested them in an MIS environment. If a research covers more than one stage, it was classified into its most mature stage. As for data collection methods, McGrath (1979) defines a field study as 'research investigations which take place within "natural" or "real life" social situations' (p.6). Experimental simulations refer to a created environment where the responses of the subjects in part determine the subsequent stimulus situation. Laboratory experiments are those studies where the researcher presents variables in a fundamental form to study them in a highly controlled environment. According to McGrath (1979), computer simulations include the area of mathematical modeling (p.8), which is characterized by its logical completeness and does not require human or computer performance.

Results

The results of the analyses are shown in parentheses on Figure 1. Of the 210 MISQ and ISR articles surveyed, 56% of them employed the field studies method, 0.5% used experimental simulation, 15% of them employed the laboratory experiment method, and 13% of them employed the computer simulation or mathematical modeling approach. Conceptual pieces and an article providing keyword classifications of MIS research represent an additional 15% of the work. The results show that most research occurs in the field settings. Of the field studies published, 77% were classified as either Stage 1 or Stage 2, with 22% classified as Stage 5. Of the 181 articles that fall in Stages 1-5 of the McGrath model (i.e., 29 articles do not directly contribute to theory building), 43% of them are in Stage 1, 24% of them in Stage 2, 14% in Stage 3, 4% in Stage 4, and 14% in Stage 5. The results indicates that research distribution lacks in Stage 4 - validation of theoretical models in limited situational context. The other stages are represented fairly evenly, but with more emphasis on Stage 1 - exploratory studies.

Conclusions

The results from this study indicate that the top two MIS journals reflect more of a theory generation approach (Stages 1-3 of McGrath model) than a theory testing approach (Stages 4-5 of McGrath model). This may be so because MIS is still a relatively young and growing field. Although research carried out at all stages of the McGrath model are important in their contribution to theory building, theory testing research would advance the maturity of MIS research and help develop a cumulative tradition.

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