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PANEL 5 MAKING SENSE OF  
QUANTITATIVE DATA IN INFORMATION  
SYSTEMS RESEARCH: TRADEOFFS,  
STRENGTHS AND WEAKNESSES OF  
THREE APPROACHES TO ANALYZING  
EMPIRICAL DATA

Dale Goodhue  
*University of Minnesota, USA*

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## PANEL 5

### MAKING SENSE OF QUANTITATIVE DATA IN INFORMATION SYSTEMS RESEARCH: TRADEOFFS, STRENGTHS AND WEAKNESSES OF THREE APPROACHES TO ANALYZING EMPIRICAL DATA

**Panel Chair:** Dale Goodhue, University of Minnesota, USA

**Panelists:** Fred Davis, University of Michigan, USA  
Ron Thompson, University of Vermont, USA

Most of us are not as familiar with statistical techniques as we would like to be. Our discomfort increases as new researchers enter the field using unfamiliar techniques such as Partial Least Squares or LISREL. What are these new techniques? Are they better than the old ways of analyzing data? If so, how? How can one choose the most appropriate approach for a given research project?

This panel will give a "managerial overview" of three approaches to analyzing quantitative data for those unfamiliar with them and will explore the tradeoffs between them, with special attention to what the approaches say about measurement validity – how much assistance do the approaches give in determining if we have really captured the constructs we intended to measure. The three approaches to be discussed are the "traditional" approach (multi-trait/multi-method, Cronbach's alpha, factor analysis, and regression), Partial Least Squares, and LISREL.

The three panelists will each champion one of the approaches by analyzing a common dataset to test a causal model of the use of personal computers by knowledge workers. The model suggests that: *social norms for PC use* and *attitudes toward PC use* lead to *utilization of PCs* and that *utilization of PCs* leads to *performance outcomes from PC use*. Each construct has been measured by multiple items on a questionnaire.

Each researcher will conduct a straightforward "confirmatory" test of the original model using his chosen approach, assessing reliability and discriminant validity of the constructs, and the strength of the hypothesized links between constructs. He will then follow the indications of the analysis to develop a revised "exploratory" model based on insights uncovered using the analysis technique.

Finally, the panelists will argue their own points of view on the merits and demerits of the three approaches, discussing the underlying assumptions, difficulties, and strengths. Comments and discussion from the floor will be welcomed.

# INTRODUCTION TO MINI-TRACK: PERSPECTIVES IN INFORMATION SYSTEMS RESEARCH

Izak Benbasat

Faculty of Commerce and Business Administration  
University of British Columbia

During the past ten years, researchers in information systems (IS) have paid increasing attention to improving the quality of their research methodologies. They have studied reference disciplines to adopt as well as adapt theories and models to support their research, focused more carefully on developing instruments with acceptable psychometric qualities, and expanded their repertoire of tools for examining empirical data. There have been two encouraging developments in this respect. First, leading journals in IS have published papers which have discussed construct and instrument development, and the relative merits of different research methods, especially qualitative ones which have not been well understood or used by a substantial portion of the IS research community. Second, the editors and reviewers of leading research journals have demanded that empirical work exhibit a good theoretical foundation and a high quality instrument development process.

Along the same lines, the objective of this mini-track on research methods is to impart IS researchers with the knowledge to improve the quality of empirical research. The emphasis is on a topic which has not been discussed in detail in the literature, namely, the tools and the methods researchers can utilize to make sense out of empirical observations. The two panels in this track will focus on the two extremes of the empirical continuum – *qualitative* data and *quantitative* data. Within each of these two broad categories, the panelists will explain the different methods to examine data and point out the strengths and weaknesses of each. It is hoped that the audience will acquire an appreciation of the subtleties involved in collecting and analyzing data, be in qualitative or quantitative, as well as a respect for the difficulties faced by researchers when conducting empirical research of any kind.