Association for Information Systems
AIS Electronic Library (AISeL)

ICIS 1994 Proceedings

International Conference on Information Systems (ICIS)

12-31-1994

The Partial Least Squares Approach for Causal Modeling in IS Research

Wynne Chin
University of Calgary

Barbara Marcolin
Massachusetts Institute of Technology

Thomas Redman
Bell Labs

Arie Segev
University of California, Berkeley

Richard Wang
Massachusetts Institute of Technology

TUTORIAL 1

THE PARTIAL LEAST SQUARES APPROACH FOR CAUSAL MODELING IN IS RESEARCH

Wynne Chin
Barbara Marcolin
Faculty of Management
University of Calgary

Structural Equation Modeling (.e., causal modeling) is rapidly becoming a predominant technique for analyzing data among IS researchers. Among those researchers using the causal modeling approaches, the covariance based technique as exemplified by LISREL is the more widely known and employed. We argue that the lesser known technique of Partial Least Squares (PLS) is likely more appropriate for the majority of such IS research.

PLS is well suited if your research involves multiple indicators of latent variables or constructs, if you wish to account for measurement error among the indicators, and if you wish to estimate the reliability and validity of these measurements within the context of your theoretical model. Finally, PLS comes to the fore if you are faced with data conditions that preclude the necessary conditions for using LISREL (i.e., non-normality and small sample size) and would like to create construct scores for predictive purposes.

The objective of the tutorial is to present a state of the art overview of the Partial Least Squares method and position it among other analytic techniques as well as within IS research. Furthermore, this tutorial will highlight the philosophical and operational issues that should be considered when employing causal modeling.

Attendees of this tutorial should come away with the following:

- an understanding of where PLS stands in relation to other multivariate techniques.
- an understanding of the conditions when PLS is appropriate for analyses.
- an understanding of causal diagrams.
- the basic philosophical and operational differences in structural equations modeling.
- the general algorithm by which PLS generates its results and implications for sample size, data distributions and epistemological relationships between measures and concepts.
- how PLS and LISREL compare and compliment one another.
- a demonstration of the PLS-Graph software package for interactive PLS analyses.

Throughout this tutorial, we will be presenting the PLS approach in relation to IS related data and theory.

The presenters have a combined experience in PLS causal modeling of over thirteen years. Both have used the technique extensively in their research and have made presentations at various conferences, universities, and businesses. In addition, the PLS-Graph software, created by one of the presenters, is the only known PLS software that is under further development and support.