Preface

Causal maps represent cognition as a system of cause-effect relations for the purpose of capturing the structure of human cognition from texts, either archival or interview generated. Given the structure of causal maps, they can be represented pictorially, or as matrices. Once these cognitive structures have been represented, they can be examined for patterns, theory building or hypothesis testing. As you will see, the tool is *versatile* and can be used for policy making, exploratory, theoretical, and large scale empirical works.

Ever since Axelrod developed causal mapping as a tool for policy research its use has been increasing in frequency for research in various disciplines. IS researchers are just now discovering the power of causal mapping as a *research tool*, and its importance in *knowledge management*. Given the newness of the tool to the area, most researchers use other disciplines to learn about causal mapping, thus having to adapt the method for use in IT contexts.

The mission of the book is to bring together in a *single volume* both the necessary knowledge for using causal maps, recent advances yet to reach the professional IT community, and IS research works in progress employing causal mapping as a tool. Thus the primary mission of the book is to provide an *authoritative* source - a *one stop learning place*, if you will - for researchers interested in using causal mapping as a research or policy tool.

Contents of the Book

To accomplish this mission the chapters are clustered into four sections.

Section I lays out the context of the book, presenting the history and logic of causal mapping, and the mechanics of using it as a research or policy tool. Chapter I by Narayanan provides a historical perspective on the evolution of causal mapping into

the IS/IT field. It sketches the diversity of perspectives, research contexts and foci within the causal mapping method. In Chapter II Armstrong explicates the choice points a researcher will face when conducting a causal mapping study and demonstrates the step-by-step process for conducting causal mapping research. Finally, in Chapter III, Hodgkinson and Clarkson review the major developments in the causal mapping method across a variety of domains so as to address the strengths and limitations of various approaches for the IS/IT community.

Section II includes five chapters that highlight the current advances in research (being made in related disciplines) using causal mapping to enrich the research of those currently employing causal mapping in IT research and policy making. Thus Chapter IV by Diesner and Carley details an approach to text based causal maps called the meta-matrix model, which lends a second level of organization to the networks of concepts found in a text. A tool for text analysis (AutoMap) is detailed in a demonstration of the approach. Chapter V by Srivastava, Buche and Roberts demonstrates the use of the evidential reasoning approach under the Dempster-Shafer theory of belief functions to analyze revealed causal maps in an IT organization example. Chapter VI by Vo, Poole and Courtney provides two studies that compare three approaches to building collective causal maps: aggregate mapping, congregate mapping and workshop mapping. The approaches are compared both conceptually and empirically to determine which approach performs best. In Chapter VII, Armstrong and Narayanan provide an extension of the causal mapping method in which casual maps derived from interviews are juxtaposed against causal maps developed from survey responses. Similarities and differences of the maps are discussed as well as the appropriateness of this validation technique. In Chapter VIII Nelson provides some reflections on the interactively elicited causal mapping process in a discovery (or exploratory) context. Issues in the interview process, identification procedure and coding scheme development are addressed.

Section III provides examples of papers in IS/IT using causal mapping techniques. Two chapters represent examples of causal mapping in IS/IT. Chapter IX by Tegarden, Tegarden and Sheetz details a study which focuses on the identification of cognitive diversity through causal mapping and cluster analysis. The study uncovered cognitive factions (diversity) within a top management team and details the various perceptions of the firm. Chapter X by Larsen and Niederman studies the use of UML and object-oriented analysis and design in software development. The remaining three studies illustrate the use of causal mapping inn applications. In Chapter XI, Ackermann and Eden focus on the use of causal mapping to facilitate the development of a shared meaning between business units and IS developers through a common platform which enables negotiated outcomes. Chapter XII by Micklich uses concept mapping, cognitive mapping and causal mapping to investigate factors in the demise of a telecommunications leader through a case study analysis. Finally, Chapter XIII by Luca Iandoli and Zollo presents a methodology based on causal mapping for the investigation and management of knowledge created by software development teams engaged in application development. A detailed application of the methodology to a case study in a software development firm is presented to demonstrate the methodological aspects.

The final section presents proposals for future causal mapping research to excite those whose research can be enriched by the use of causal mapping. Chapter XIV by Otondo presents a proposal to extend causal mapping research by representing linguistic and

semantic nuances in associative, categorical and cognitive maps. Those maps are then used to link related elements to causal maps to create an integrated logical view of object-oriented design. In Chapter XV, Narayanan and Liao outline several methods for approaching the behavior of causal maps.