Chapter XII
The Intellectual Structure of Decision Support Systems Research (1969–1989)

ABSTRACT

This is the capstone chapter that shows how the concepts, tools, and techniques discussed in each of the previous chapters can be applied in conducting author cocitation analysis using a real data in the DSS area. The step-by-step procedures are shown in detail from the preparation of data file in Excel format and importing the file to the SAS system for multivariate statistical analysis. This chapter also guides the readers through the process of analyzing the results of principal components analysis, cluster analysis, and multi-dimensional scaling. The chapter also shows how to apply different criteria to select the optimal number of factor solutions, cluster solutions, and evaluating the acceptability of multi-dimensional scaling outputs. This chapter reports part of the intellectual structure of the DSS field by means of an empirical assessment of the DSS literature over the period 1969 through 1989. Three multivariate data analysis tools (factor analysis, multidimensional scaling, and cluster analysis) are applied to an author cocitation frequency matrix derived from a large database file of comprehensive DSS literature over the same period. Four informal clusters of decision support systems (DSS) research subspecialties and a reference discipline were uncovered. Four of these represent DSS research subspecialties—foundations, model/data management, user-interface/individual differences, and group support systems. One other conceptual grouping defines a reference discipline of DS—organizational science.

INTRODUCTION

All previous discussions in the book provide the readers with detailed descriptions of concepts, issues, processes, and tools of author cocitation analysis. This chapter demonstrates how the concepts, tools, and techniques discussed in each of the previous chapters can be applied in conducting author cocitation analysis, using real data in the MIS area. The step-by-step procedures will show the readers what to do and what not to do and how to do it in a most efficient and effective way. The application section, section V, contains two chapters. The first chapter in the section emphasizes the technical dimension of ACA, while the last chapter put more emphasis on the non-technical aspects of ACA.

Within the managerial and organizational context, it was in the early 1950s when one of the first computers began to process payroll data. Since then, the study of computers and information systems has evolved continuously. Since the early 1970s, scholars in the management information systems (MIS)/decision support systems (DSS) areas have recognized the important roles computer-based information systems play in supporting managers in their semi-structured or unstructured decision making activities. For example, Gorry and Scott Morton (1971, p. 57) made the controversial claim that, "information systems should exist only to support decisions." Since then, there has been a growing amount of research in the area of DSS (Elam, Huber, & Hurt, 1986; Hyun B. Eom & Sang M. Lee, 1990; Farhoomand, 1987; Teng & Galletta, 1990). As Keen (1980) indicated in the early 1980s, it is necessary for information systems research to clarify reference disciplines and to build a cumulative tradition, in order to become a coherent and substantive field. This is necessary for DSS research as well. In the DSS area, Eom, Lee, and Kim (1993) conducted an initial study to identify two areas of contributing disciplines (management science and multiple criteria decision making) and five subspecialties of DSS research (foundations, group DSS, database management systems, multiple-criteria DSS, marketing DSS, and routing DSS). Due to the restrictive nature of their data set (specific DSS applications only), their study failed to provide a comprehensive picture of DSS research subspecialties.

Decision support systems are a relatively young field of study, compared to others, such as economics, organizational behavior, etc. As an area continues to grow and becomes a coherent field, the study of the intellectual development of the field is important. A number of prior studies have been conducted to assess the extent of progress within these stages in the decision support systems area (Eom, 2007).

The decision support systems (DSS) area originated from the late 1960's. It continues to be a coherent academic discipline. This chapter investigates the intellectual development of DSS during 1969 and 1989 using ACA. Cocitation counts data is to be analyzed to assess the progress that has been made during this time.