

Chapter XIII

The Changing Structure of Decision Support Systems Research: An Empirical Investigation through Author Cocitation Mapping (1990–1999)

ABSTRACT

This chapter extends an earlier benchmark study (Sean B. Eom, 1995) which examined the intellectual structure, major themes, and reference disciplines of decision support systems (DSS) over the last two decades (1960-1990). Factor analysis of an author cocitation matrix over the period of 1990 through 1999 extracted 10 factors, representing 6 major areas of DSS research: group support systems, DSS design, model management, implementation, and multiple criteria decision support systems and five contributing disciplines: cognitive science, computer supported cooperative work, multiple criteria decision making, organizational science, and social psychology. We have highlighted several notable trends and developments in the DSS research areas over the 1990s.¹

INTRODUCTION

Earlier studies documented the intellectual development of the decision support systems (DSS) area over the last two decades (1969-1990) in terms of two of the three main needs defined by Keen (1980)— reference disciplines and a cumulative tradition. Eom (1995 p. 517) concluded that “After 20 years of research, the DSS literature does not exhibit an overall DSS research paradigm. Nonetheless, this study convinces the author that DSS is in the active process of solidifying its domain and demarcating its reference disciplines.” This paper assesses the ongoing changes in the intellectual development and structure of DSS research, using multivariate analysis of an author cocitation matrix over the period of 1990 through 1999. This study aims at identifying the intellectual structure, reference disciplines, and major themes in DSS research over the past ten years (1990-1999) with a particular emphasis on contrasting the structural changes in the intellectual structures in the DSS area over the period of 1969 through 1990 and the period of 1990 through 1999.

DATA AND RESEARCH METHOD

The data for this study were gathered from a total of 984 articles in the DSS area over the past ten years (1990-1999) using the criteria described in our earlier study. The number of citing articles can be an indicator of vitality of the DSS area. During the past 10 years, DSS researchers have published 984 articles at an average rate of 98.4 articles per year, while the previous two decades (1969-1990) had published a total of 632 articles at an average rate of 31.6 articles per year.

The raw cocitation matrix of 171 authors is analyzed by the factor analysis program of SAS (statistical analysis systems) to ascertain the underlying structure of DSS research subspecialties. Principal component analysis (varimax rotation) with the latent root criterion (eigenvalue 1 criterion) is applied to obtain the initial solution of 15 factors (see Table 1). The scree tail test indicates that only the first twelve factors should be qualified. For further details of author cocitation analysis including the statistical method used, readers are referred to Eom (Sean B. Eom, 2003).

RESULTS

Based on careful examinations and interpretation of these outputs, ten factors resulted, as shown in Appendix 1. The ten extracted factors account for 84.11 percent of the

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