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Systems Planning and Analysis Research 1970 to 2002: A Comparison of Academic and Practitioner Activities

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Abstract

Systems planning and analysis is an integral part of information systems research, education, and business practice. This study identifies differences between academic and practitioner research during the period 1970 to 2002. The Wetherbe and Vitalari (1994) systems framework classifies the literature within the domains of systems planning and analysis. An expanded version of the Singleton, Strats, and Strats (1993) structure organizes the data based on the inquiry method. A seven dimension classification schema, proposed by the authors, is used to organize the data based on study orientation. The Tapscott and Caston (1993) information age segmentations, pre-1990 and post-1990s, support the existence of two analytical time frames and are used to identify shifts in research focus. Thirteen internationally recognized journals within the IS community—ten academic and three practitioner—provide the data source for this comparative research. Content analysis is used as the primary data coding technique. Correspondence analysis is used to identify themes, patterns, and trends across the classifications structures. Independent rater reliability procedures verified coding classifications. ANOVAs determined significance and direction of research differences. Graphic plots were derived for interpretation of the results. This study contributes to field knowledge by systematically analyzing the differences in research schema for academics and practitioners. Research gaps will be highlighted and areas of future investigation will be suggested.

Keywords: Systems planning, systems analysis, academic research, practitioner research, comparative analysis

1 BACKGROUND

Systems planning and analysis are widely investigated within academic research. An abundance of meaningful research exists within these domains (Beath and Orlikowski 1994; Iivari et al. 1998; Premkumar and King 1994; Sabherwal and Robey 1995). The systems planning and analysis domains have become a foundation of undergraduate and graduate information systems education (Davis et al. 1997, 2002; Feinstein et al. 2000; Lidtke and Stokes 1999; McLeod 1996). Systems planning and analysis are fundamentals of business practice (Graf and Misic 1994; Teo and King 1999; Trauth et al. 1993). Multiple streams of systems planning and analysis research exist such as system methodologies (Coad 1992), system tools (Orlikowski 1993; Vessey and Sravanapudi 1995), techniques (Kobryn 1999, 2000), requirements specifications (Vessey and Conger 1994), cultural affect on systems (Shore and Venkatachalam 1995), strategic IS planning (Segars and Grover 1998), the systems analyst’s role (Graf and Misic 1994; Green 1989), and IS job skills (Todd et al. 1995). Over the past 30 years, IS researchers provided varying levels of consideration to the diverse research streams. It is well known that focus and contribution differ between academics and practitioners. Yet, no empirical evidence confirms or denies this assertion. This comparative analysis serves to empirically identify and validate the identification of specific research gaps within the literature between academic and practitioner activities.
2 RESEARCH PURPOSE AND INVESTIGATIVE FRAMEWORK

The purposes of this study are to determine if gaps in systems planning and analysis research exist over a 30-year period 1970-2002, and to describe the nature of these differences through a comprehensive exploration. This empirical study investigates the similarities and differences in academic and practitioner focus across a variety of research streams through application of four classification schemas.

The Wetherbe and Vitalari (1994) framework is used to classify and categorize the literature within the domains of systems planning and analysis. Using Tapscott and Caston (1993), the information age is segmented into two time periods: pre-1990s and post-1990s. An expanded version of the Singleton et al. (1993) categorization of research approaches within the social sciences is used to organize the data, based on the inquiry method. A seven-category methodological orientation schema, proposed by the authors, further classifies the literature. The four classification schemes are designed to display the data from several different perspectives, which may result in some comparative overlap.

The authors identified studies based on systems planning or systems analysis research published in recognized IS journals (Mylonopoulos and Theoharakis 2001). No research was found that systematically identified research differences and gaps between academics and practitioners over the 30-year period. Trauth et al. (1993) investigated industry expectation gaps related to skills and knowledge obtained by university graduates based on the students’ academic preparation. Other studies typically investigated specific areas or streams of systems planning and analysis rather than provide a comprehensive comparative investigation. Examples of stream-focused research include the benefits of using object-oriented techniques (Fedorowicz and Villeneuve 1999) or the integration of business planning with information systems planning (King and Teo 2000).

3 RESEARCH QUESTIONS

This empirical study offers a comprehensive exploration of the systems planning and analysis research over the last 30 years in an attempt to answer the following questions:

1. What are the similarities and differences between academic and practitioner research within the domains of systems planning and analysis?
2. In which streams of research do gaps exist?
3. To what extent do themes emerge from the data?
4. What are the differences in research focus, pre-1990 and post-1990s, between academics and practitioners?

The findings from this study reflect where the research focus has been within systems planning and analysis. These results lead to recommendations for academics and practitioners to guide future research directions. Recommendations are suggested to strengthen academic curricula and improve the identification of organizational needs along with assisting organizations to build and operate more effective and efficient information systems. This differential analysis is premised on an integrated theoretical foundation presented in the next section. The research methodology and the data analysis protocols are introduced. Conclusions and expected contributions are offered. The current status of the research is presented.

4 THEORETICAL FOUNDATIONS

4.1 Dimensional Classification

A modified version of the framework proposed by Wetherbe and Vitalari (1994) categorizes systems development through a four-dimension structure composed of philosophy, management, human resources, and technology. Philosophy pertains to the strategic and methodological issues associated with systems development. The management dimension relates to project management and planning issues. Human resources focus on individual skill sets, career issues, and qualities of an effective systems analyst. The technology dimension includes tools and techniques used in the systems development process. The framework was expanded for use in this study. The philosophy dimension was expanded to include methodologies, requirements, and systems specifications. The human resources dimension includes characteristics of an effective systems analyst, the skills needed in the systems curricula, and cultural issues and affects.
4.2 Research Strategy Classification

The research strategy classification of Singleton et al. (1993)—experiments, surveys, field research, and the use of available data—forms the basis of this schema. The classification was expanded to include case studies, action research, and conceptual research protocols. The structure differentiates the type of investigatory method employed by the primary researchers, while subsequently providing a second parameter for classification and comparative analysis.

4.3 Outcome Orientation Classification

A seven-dimension classification scheme, developed by the authors, categorizes the literature based on the outcome orientation. The seven outcomes include: (1) technological; (2) managerial; (3) organizational; (4) behavioral; (5) cultural; (6) procedural; and, (7) strategic. Table 1 describes each of the outcome orientations.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definitional Foundation</th>
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<tbody>
<tr>
<td>Technological</td>
<td>Investigates a particular technology/tool or considers the technological functioning, e.g., comparing CASE tool functionality.</td>
</tr>
<tr>
<td>Managerial</td>
<td>Focuses on issues or concerns to managers, e.g., IS planning problems.</td>
</tr>
<tr>
<td>Organizational</td>
<td>Considers organizational issues, e.g., financial constraints and impacts on IS control factors.</td>
</tr>
<tr>
<td>Behavioral</td>
<td>Addresses behavioral issues or skills, end user perceptions, or utilization effect by end users.</td>
</tr>
<tr>
<td>Cultural</td>
<td>Focuses on cultural aspects, differences between users, or comparison of cultures, e.g., systems development team culture.</td>
</tr>
<tr>
<td>Procedural</td>
<td>Concentrates on processes or procedures including short and long term information requirements, the servicing processes in working with IS, and operational functions.</td>
</tr>
<tr>
<td>Strategic</td>
<td>Addresses strategic issues relating to planning, strategic focus, the importance of a strategic orientation, and linking the business strategy with the IS strategy.</td>
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4.4 Time Segmentation

A further comparative classification structure employed the Tapscott and Caston (1993) model of paradigm shifts. Tapscott and Caston suggest that four paradigm shifts—new business environment, new enterprise, new geopolitical order, and new technology—represent the fundamental changes evolving into the second era of the information age. Tapscott and Caston further describe the 1990s as the second epoch of information technology marked by shifts in business functionality. Technology is the driver of these paradigmatic shifts and a precondition for business success in this next information age. Tapscott and Caston’s segmentation of the information age is the basis for considering the systems planning and analysis lineage across two time frames: pre-1990 and post-1990s.

5 RESEARCH METHODOLOGY

Manuscript abstracts were obtained from online and paper database sources of 13 professional journals during the period 1970 through 2002 (see Table 2). These journals were selected based on the Mylonopoulos and Theoharakis (2001) analysis, which classified the top information systems journals. The aims and scope of the journal established the criteria for classification as academic or practitioner. All journals are research-based because conclusions drawn in popular press publications are often premised on untested propositions. Ten academic and three practitioner journals were selected. A total of 533 articles were explored, 269 academic and 264 practitioner.
Table 2. Journals Reviewed

<table>
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<tr>
<th>Academic Journals</th>
<th>Practitioner Journals</th>
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<tr>
<td>MIS Quarterly</td>
<td>Journal of Systems and Software</td>
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<tr>
<td>Information Systems Research</td>
<td>Information and Software Technology</td>
</tr>
<tr>
<td>Communications of the ACM</td>
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<tr>
<td>Decision Sciences</td>
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<tr>
<td>Decision Support Systems</td>
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<tr>
<td>International Journal of Information Management</td>
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<td>Information and Management</td>
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<tr>
<td>European Journal of Information Systems</td>
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<tr>
<td>IBM Systems Journal</td>
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</table>

5.1 Phase 1: Literature Coding [Completed]

Manuscripts were first coded into the Wetherbe and Vitalari (1994) classification structure to capture the various systems planning and analysis research domains. Next, documents were stratified based on a grounded theory identification of applicable research streams. These streams included methodologies, tools, techniques, requirements, systems specifications, culture, planning, the systems analyst, and the skill base needed for graduating IT students. Manuscripts were then cross-coded into the Singleton et al. (1993) structure to differentiate between research methodologies. A seven-outcome orientation structure further categorized the manuscripts.

An alternative, independent coder helped to improve reliability by providing a partial control for data coding and input error. Secondary coding procedures generated a 93 percent inter-rater reliability index.

5.2 Phase 2: Data Analysis [Completed]

Data analysis was conducted in four stages. First, correspondence analysis was used to examine the nature of relationships between variables for incomplete a priori expectations. Correspondence analysis has been used in prior information systems research (Loslever 2001). An analysis was conducted to identify themes within the data points. Second, a graphical point map was generated. Third, subgroup analysis was conducted on the aggregated cross tabulation tables. Fourth, ANOVAs determined significance and direction of research differences.

6 PRELIMINARY CONCLUSIONS

Initial results indicate that there is a significant and fundamental difference in orientation between academic and practitioner research. In particular, academics were oriented toward planning research while practitioners focused on tools used to develop and improve systems. Changes were also seen differentially in the two time periods.

6.1 Expected Contributions

This study provides the first comprehensive analysis of systems planning and analysis research across the 30-year period. Differences between research streams are noted, thereby establishing gaps where research shortcomings exist. Academic and practitioner expertise areas are acknowledged.
6.2 Current Status of the Project

Data analysis is completed. Interpretative analysis and identification of final results and conclusions are completed. A detailed discussion including final results, conclusions, and recommendations for future research will be available for presentation at the conference.

7 REFERENCES


