Qualitative Decision Impact Model: A tri-partite broadcast social network approach

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Decision theory is the mathematics of making decisions under certain conditions of uncertainty. A major shortcoming in the application of decision theory to human problem-solving is that it is difficult to sufficiently account for the influence of specific instances of human social-psychological conditions in making value judgments. Equally challenging to decision theory are the complexity and diversity of human problems. The P2h.D. decision impact model describes the configuration of a structured and intentionally sustained network of podcasts, blogs, and wikis to provide informal resources and examples of human experience to supplement formal resources developed out of decision theory modeling.

Introduction and Background

Making a life-style altering decision is challenging, particularly one that involves a financial cost and potential physical relocation. Add considerations of family and the impact magnifies. And yet it is the factors of uncertainty and ambiguity that are clarified too late that may transform what seemed a good decision into one of a major error. The mind, left with quasi-known factors left untapped can turn a playground of opportunity into a little shop of horrors, leading the decision-maker down a path of false pretenses resulting in a poorly made decision. When the factors and choices fall between black and white, traditional decision tools fail the grey area between. It is in this abyss of multiple and unclear options that a system may provide insight to aid the decision-maker toward a more informed decision.

Uncertainty and ambiguity are inherent issues when making a life-style altering choice. One example of such a decision is the pursuit of higher level academic studies, particularly

doctoral studies. Obvious factors considered when making such a decision involve the selection of program of study and research topic of interest. However, such programmatic decisions are aided by pamphlets, websites, and other literature that clarifies options and opportunities at each institution of education. However, such a life-style altering decision centers on less definitive issues such as financial costs in addition to possibly leaving gainful employment, relocation of self and family, and a change in status from practitioner to academician.

Statement of the Problem

Student/faculty ratios in Library and Information Science (LIS) professional degree programs is high based on demand for new professionals to replace the graying practitioner population (ALISE, 2005). This trend is predicted to continue through 2009. The graying of the profession is reflected in the academic discipline of LIS as well. A mere 4 % of those earning the LIS professional master's degree continue to the doctoral level; thus the number of new faculty available to replace their retiring colleagues at any time is alarmingly low. Unfilled faculty positions increased from 42 to 55 between 1996 and 2000.[1] The seriousness of this shortfall was further emphasized by the job-posting to job-candidate ratios for 1998-2000 ALISE annual conferences. In 2000 and 2001, that ratio was greater than 2:1. At the 2002 ALISE conference, fifty of the fifty-three member LIS schools posted one or more job vacancies, while only thirty five applicants filed resumes expressing interest in obtaining a faculty position. The need for prepared academicians in LIS remains in high demand.

Prior to the advent of Internet technologies, the opportunity for a potential applicant to contact a knowledgeable and experienced individual was left to an on-campus visit. On-site visits allow for contact with both faculty and students to obtain a sense of place and fit for the potential student. However, personal issues are less likely to be addressed when one is concurrently trying to make a positive impression in an effort of acceptance into the program while at the same time attempting to decide if the program and place are the right choice. Furthermore, most interested individuals will not go so far as to make the on-site visit if the grey areas of ambiguity and uncertainty remain unanswered. Today, preliminary inquiries can be made via less direct methods such as e-mail. However, this communication still retains issues of conveying a first impression linked with an identity. In this sense, studying the effects of anonymous and informal inquiry via Internet technologies is particularly interesting.

Statement of Purpose

The aim of this paper is to report on a decision impact model, specifically PhD^2 that was designed as a structured and intentionally sustained network of podcasts, blogs, and wikis to provide informal resources and examples of human experience to supplement formal resources developed out of decision theory modeling.

Brief Review of the Literature

Research and development in the area of decision support systems (DSS) has mainly centered on organizational use, management applications, and group-based work support.

Wysk (1990) discusses the application of decision support to expert systems. The complicating factor is the complex domain of management with expertise falling in both individual and collective domains. Application in this context involves DSS for supporting collaborative group work with an emphasis on reducing uncertainty among options. Relevant here is Wysk's suggestion that a variety of technologies be employed to support management decision making processes. The shortcoming, as it relates to this research, is the availability of a standard set of structured data comprising the sea of choice among alternatives for application to a solution.

Luconi (1986) recognized the shortcoming of applying expert systems to support complex problems that are unable to be solved perfectly. He suggested heuristic systems that emphasize people in what he terms an expert support system. However, Luconi's system was based on artificial intelligence structure whereby the system relied on seven key elements:

- Language processor
- Knowledge base (with facts and rules)
- A rule interpreter
- A scheduler to control rule order
- A consistency enforcer
- A justifier to explain system behavior
- A blackboard (results recorder)

Again, the shortcoming is an emphasis on the system with human variables considered as secondary to the decision support process.

Wilson et al (1993) suggest in their research that the system alone cannot account for failures of decision support systems in management applications. The article suggests that in order to offer effective support, the political and moral foundations of system design

must be subject to analysis to secure social rationality for use of decision support systems within the organization. In other words, the authors recognize the shortcoming of systems to reflect the complex nature of managerial work. Wilson and his colleagues suggest the need to consider qualitative aspects of decision-making in the construction of decision support systems for management of organizations.

Young (1991) extended the idea of using DSS beyond the managerial function in organizations to a broader application of idea processing. Idea processing is a special type of qualitative decision support system where users' thinking and creative processes are supported. Idea processing involves divergent processes where open thinking leads to a multitude of combinations that provide possible answers. Young proceeds to discuss the difference between declarative knowledge (facts and figures) and procedural knowledge (meta-knowledge). Procedural knowledge is used to analyze and act on declarative knowledge for the purpose of making a decision. It is at this point that developers realize that systems must move beyond a limited set of options (resources in the form of declarative knowledge) to more robust procedural-based systems. Yet, the focus on DSS application remains within the organizational context where individuals or groups are responsible for making organizational-related decisions.

The expansion of DSS design to qualitative decision approaches also opened the door for support of collaborative work where many users are connected via an electronic system of communication. Bui and Jark (1986) discuss the system architecture for optimal support of collaborative group decision-making processes. The authors, recognizing a loss of communication in a distributed group work system, proceed with an analysis of types of communications and propose a model for improved communication in a GDSS.

Kraemer and King (1988) discuss the evolution of DSS to group work and decision making. They identify productivity loss among groups as based in three inherent problems; information loss, information distortion, and sub-optimal decision-making. Kraemer and King's article also addresses the architecture of group-based decision support systems. Hardware includes conferencing capabilities, audio-visual, as well as general computing equipment. Their emphasis is on software. The authors note that it is the key technical feature of a DSS with access to databases, programming languages, spreadsheets, and statistical analysis packages. Software applications also include specific group decision-making tools such as stakeholder analysis, brainstorming, nominal group technique and Delphi study capabilities to name a few. Finally, the authors turn to the importance of people in the DSS. An emphasis is placed on the role of the computer support specialist in maintaining the system operability between group participant links. Again, the emphasis remains on system architecture rather than human element involvement in the decision process.

PhD^2 (Decision Tool)

Initial development of the decision tool was based on data gathered by Project Athena Fellows engaged in recruitment activities at select non-doctoral degree granting SLIS programs (Burnett and Bonnici, 2001). The data indicated that the decision process was more complex and diverse than the review of the prior research on this topic revealed. A major factor in the list of concerns that a closed design approach raised was that of liability issues that might be associated with over-reliance on the tool in making what could be a serious and costly life decision.

In response to the above challenges, the researchers conceptualized the tool as an open, "decision impact" tool based on social networking, which also happened to be a core value associated with Project Athena. This tool is designed to provide a body of knowledge regarding successful and unsuccessful pursuit of doctoral work. It represents the collective wisdom of Project Athena Fellows' experiences to inform and aid prospective doctoral students as they make decisions about pursuing doctoral studies in LIS.

During the months of November and December 2006 and January 2007 Project Athena Fellows interviewed students in several LIS master's degree programs who were willing to share their considerations and concerns on pursuing a doctoral degree. The data from the interviews was extracted and analyzed. Findings served as a baseline for determining the major factors promoting as well as deterring pursuit of doctoral level studies in LIS.

With this baseline knowledge, the researchers employed a social network approach. The design structure of the tool combined three independent information distribution, information access, and information sharing tools to build the open decision impact system. The tools include podcasting, blogging, and wiki.

Tool 1: Podcasting

Podcasting is a proven method for sharing information in an asynchronous and portable format. This format also allows for a planned approach to introducing information to a prospective audience. The format is operating system independent; meaning the file format works on PC and Mac computer systems as well as on more portable platforms, such as iPods.

All Project Athena Fellows recorded their experiences regarding the choice to pursue doctoral studies using Audacity, a free (shareware) recording tool available via the World Wide Web. More specifically, these recordings tell their stories of how they came to pursue doctoral studies, and relate obstacles and successes that they have had since making this decision. The Fellows shared the following information regarding the decision to pursue

doctoral studies:

- The factors and experiences that led them to consider a Ph.D. in the first place;
- The issues that they felt were important in making their decisions, and how they resolved those issues
- The challenges they encountered during the application process and as they began their doctoral programs;
- The gaps that were not addressed during the decision making process that they now perceive were important;
- Obstacles and successes that they have experienced since their admission that they feel would be useful for others to know about prior to making the decision to pursue a Ph.D.

These recordings have been converted to podcast format and stored for scheduled strategic dissemination in relation to appropriate conferences such as ALA, ALISE, ASIST, and PLA. The first three podcasts have been linked to RSS feeds. The first featured podcast will be announced via professional listserves and will be posted online to the Project Athena website two weeks prior to the ALA Annual Conference in Washington, D.C. (June 2007). The message to be posted to the listserve contains links to the RSS feed where the podcasts can be downloaded by individuals with interest in doctoral studies in LIS.

Tool 2: Blogging

A blog spot has been set up for initiating discussion between project fellows, potential students, and LIS professionals to discuss the topic pursuant to the publication of the podcast via the web. A question will be planted in response to each fellow's podcast content. At the culmination of the podcast broadcast listeners will be invited into the blog to engage in discussion. The intent is to provide individuals who are considering doctoral studies an opportunity to ask questions regarding their thoughts and concerns on the topic, thus establishing a social network that can provide support throughout the process. Opening the discussion to the larger LIS community, particularly current doctoral students and individuals holding the degree provides for a broader perspective in addressing questions and enlarge the social network.

Tool 3: Wiki

Long-term research planning based on Project Athena data will be conducted based on content analysis of the podcasts and social network analysis of the blog files. As a result of the data analysis, the researchers will develop two lists; an initial list of the ten most predominantly mentioned positive factors and the ten most predominantly mentioned negative factors.. These lists, and a document discussing each factor will be prepared and posted to a Wiki and made available via a link from the Project Athena website for sharing

with the podcasters, bloggers and other interested individuals. The Wiki approach will allow participants to engage in editing, updating, and revising the lists and the documents. The Wiki approach will also promote critical thinking about the issues since participants will be required to explain the changes that they propose. In time, the lists will evolve into documents that are agreed upon collectively by the participants. These documents will provide an additional information resource for future individuals considering doctoral studies.

Using this social network approach to open tool design allows the system to evolve over time to meet contemporary needs. As the LIS professions evolve and change, so will doctoral programs. Over time, factors that were important at a given time, such as funding availability and residency requirements, may change as well. An open tool designed using a social network approach will ensure that the tool remains useful and current as these changes occur, thus enhancing its sustainability. This approach also extends the potential reach of the tool across the national borders that would have presented constraints in the closed design originally proposed by this project.

Notes

1. These numbers reflect the number of positions that were advertised but not filled at the end of each recruiting year.

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