Decision Support System (DSS)
Heart Component for MIS Development

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ABSTRACT

Designers often have ignored the human and organizational element, and concentrated on the technical implementation of the hardware/software mix (Hutchinson, 2000). Every next wave of technology brings its own expectations and surrounding hype; the field of decision support is no exception: on one hand, the need for reliable decision-making clues stays permanently; and, on the other hand, substantial development supply of decision support tools does not seem to play in exact tune with the above need.

Key words: Decision Support System, Heart component, MIS development.

INTRODUCTION

DSS- Review: History to advancement

Since the early days of decision support systems (DSS) and technologies, the principal emphasis has been made on the side of supporting the decision mechanics rather than supporting the deciding person or entity. Designers often have ignored the human and organizational element, and concentrated on the technical implementation of the hardware/software mix (Hutchinson, 2000). Every next wave of technology brings its own expectations and surrounding hype; the field of decision support is no exception: on one hand, the need for reliable decision-making clues stays permanently; and, on the other hand, substantial development supply of decision support tools does not seem to play in exact tune with the above need. Some frustration in DS technologies and systems has been taking place (Davenport, 1997, Raggad, 1997) as a product of missing the target of user's needs. Meanwhile, numbers of case studies and publications have shown benefits in separate cases, thus leading to the idea of finding out with the users themselves.

Considerable recent research has been concentrating on the support of the person technology relation in decision making. A number of works have been emphasizing that business decision making environment is a unity of decision makers' experience, beliefs and perceptions on one side, and decision support tools and techniques on the other side. Previous research had shown that users often prefer simple tools and techniques for decision support (Skyrius, 2001). On the other hand, any tools and techniques that provide high-value support functions, e.g. stimulate intuition and creativity, are and would be welcome. Managerial decision making is usually characterized by a need

to develop a decision with incomplete information and pressing deadlines. Existing level of problem knowledge and problem-solving knowledge, together with available support mechanisms including IT, is then put to work and tested against current problems, the by-product of such testing being new experience and knowledge for decision participants. Decision support is a knowledge-intensive activity, and efficient use of existing knowledge as well as creation of new knowledge is essential to decision makers' problem solving capabilities. To gain a better insight into currently used and preferred decision support mechanisms, use and efficiency of support tools – IT in the first place, are discussed on the basis of surveys and interviews, conducted among decision makers in Lithuania in 1999-2001. The most recent research has been conducted on the basis of personal interviews in order to gain more open responses than a questionnaire can provide.

The author has been investigating this area in the form of surveys since 1995, both in Lithuania and in the USA, and the results allow us to suppose that questionnaires, while good at collecting simple answers and hard data, need to be combined with personal interviews to provide insight beyond these simple answers. Consequently, the aim of this paper is: to gain more insight into the users' attitudes toward computer based decision support and actual utilization of IT resources for this role by combining face-to-face interviews and existing research on the subject.

Existing Research

A substantial amount of recent work in the field of management decision making and IT-based support has been related to such aspects as intuition, creativity, knowledge creation and utilization, information search and navigation functions. This work, in my opinion, can be related to a more general area of recent information systems research interest, namely, human-centristic or user-centristic IS research and development. Some researchers in the area are stating that at the forefront of all design improvements should be the goal of better leveraging and augmenting of natural human capabilities (Workshop on Information…,

1999). Among work, dedicated to research user features in managerial decision making, we can note decision typology, presented by Basi (Basi, 1998), which specifies four principal types of decisions by the degree of certainty of their causes and outcomes:

Decision Typology (Basi, 1998)
Computational decision
Certainty about causation and outcome preferences

Judgmental decision
Outcome preferences are clear, but cause and effect relationships are uncertain

Compromise decision
There is certainty about cause and effect relationships but uncertainty about outcome preferences

Inspirational decision
Uncertainty about both; in this situation, a philosophical mind able to make informed, intuitive decisions based on historical data entwined with future perspective is necessary. Basi also states that, because of the lack of the accurate data, decisions are likely to be inspirational (intuitive) or judgmental, born out of seasoned background and informed perspectives. Such features are typical to most of the decisions that are clients of DSS. In managers' subjective approaches to decision making, Andersen (Andersen, 2000) points out four basic psychological functions: sensing – function that tells us something exists; intuition – reveals the possibilities which may exist in what has been perceived; thinking – tells us what this something is; feeling – tells us how to relate to what we have perceived based on our own subjective value system. The same source also states that intuition and thinking are most important in the creative and selective phases of decision making – alternative generation, analysis of outcomes and decision selection. Points out that managerial intuition is a key personal feature in decision making, and, while being far from simple to define more exactly, intuition lends itself to being indirectly supported by such features like tracking of past decisions, capturing ideas and accumulation of experiences with their close and distant contexts. It has to be

noted here that the widely proposed accumulation of best practices, which is often presented in the context of knowledge management issues, should be regarded critically – some earlier responses have indicated that it can seed stereotypes and stifle creativity. Galliers and Newell(Galliers, & Newell, 2000) are stating that it is the contestability of knowledge and truth that leads to innovation and creativity. More findings on the use of intuition in managerial decision making are presented in Bennett's paper (Bennett, 1998), where he points out that top managers are better in use of intuition, the reason for this being the ability to concentrate on 'big picture' and resist to concentration on details. When environment shifts happen, managers display an amazing amount of intuition about the unforeseen. The same work describes the dynamics of intuition in decision groups: insiders provide data and efficiency; outsiders provide perspective; presented data provokes intuition; intuitive thoughts call for more data and so on, deepening and widening the understanding of the problem in the process.

DSS Strong Component for MIS/BIS/EIS (Literature Review)

The potential for utilization of computers as part of information systems in the business environment was realized as early as the 1960s. The first applications were mainly aimed at automating existing tasks (Watson et al., 1991; Willcocks and Mason, 1989). As computerization evolved, systems were designed to support the management of the organisation. The earliest approach was the introduction of Management Information Systems (MIS). These systems were operated by systems professionals and were used to generate regular, pre-defined, reports containing information about the organisation (Millet et al., 1991). A later attempt to assist managers in their jobs is the utilization of Decision Support Systems (DSS). These provided assistance with specific decision making tasks. However, despite the superiority of both of these approaches over non-computerized systems and their relative success with lower and middle management, they failed to provide the necessary support to executive managers in organisations (Watson et al., 1991). "Executives are managers with formal authority over the whole of an organisation or an important functional unit of one" (Thierauf, 1991).

They have responsibility and are accountable for the results of their actions, to either other executives (higher on the organizational scale) or to the owners of the organisation (McLeod and Jones, 1986). A prominent characteristic of the executive's role is the making of decisions (Mintzberg, 1975). This refers to evaluating possible courses of action and selecting and initiating one of them. In order to take effective decisions, executives need to have access to 'high quality information.

Such information needs to be relevant to the variables affecting the outcome of the decision, accurate, timely and up to date. Moreover it needs to be accessed easily and presented in a format that makes it easily understood. Since efforts to satisfy executives' information needs through computerized systems operated by other people had not proved successful, Information Systems professionals took up a new challenge: the development of information systems to be used directly by executives. This challenge was met by the emergence of Executive Information Systems (EISs). This was an attempt to solve many of the problems experienced with previous types of information systems for management. They focus on executives' information needs and provide them with direct access to information.

The idiosyncrasies of executive managers as users of information bring forth particular constraints for computerized information systems. The term 'Executive Information Systems' was introduced in 1982 (Rockart and Treacy, 1982) to describe the kind of systems a few senior corporate officers were using on a regular basis to access information they needed. Unfortunately, there is no standard, universally accepted definition as to what the term EISs encompasses. Different researchers use a different working definition which usually refers to some characteristics of what the term 'Executive Information Systems' describes. In much of the literature the term Executive Support Systems (ESS) is used interchangeably with EISs to describe the same kind of system. Rockart and Delong (Rockart and Delong, 1988), make a distinction between the two terms. They define and use the term ESS to refer to systems with a broader set of capabilities than EISs. While the term EIS denotes providing information, ESS implies that other support

capabilities are provided. These might include communications support, like electronic mail and teleconferencing facilities, data analysis capabilities such as spreadsheets, query languages and Decision Support Systems and other organising tools, e.g. electronic calendars. What is important about this distinction is that the extra options available in an ESS, increase the system's technical requirements, as well as provide extra functionality (Watson *et al.,* 1991).

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