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Regret avoidance as a measure of DSS success: An exploratory study

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Abstract

Assessing the value of decision support systems (DSS) is an important line of research. Traditionally, researchers adopt user satisfaction and decision performance to measure DSS success. In some cases, however, the use of DSS is not benefit driven. Instead, DSS adoption may be motivated by avoiding decision errors or reducing decision cost, indicating that regret avoidance may be a useful measure of DSS success. Regret is a post-decision feeling regarding not having chosen a better alternative. Recent behavioral research has indicated that, in addition to pursuing higher performance and user satisfaction, reducing decision regret is another important consideration for many decision-makers. This exploratory study extends prior research on DSS evaluation by proposing regret avoidance as an additional measure of DSS success. Experimental results regarding the use of DSS for stock investment demonstrate DSS use significantly reduces regret in situations involving low user satisfaction. Consequently, besides decision performance and user satisfaction, regret reduction is also important in measuring the effectiveness of DSS.

Keywords: Regret theory; Decision support systems; Information systems evaluation; Information systems success

1. Introduction

As information systems, decision support systems (DSS) facilitate decision-making by offering information access, model analysis, and supporting tools [2,40]. DSS enable us to believe that the system positively influences decision quality. Measuring DSS success is difficult. Decision-makers use technological tools to fulfill various functions. Traditional definitions of DSS suggest that DSS are designed to help decision-makers address unstructured or semistructured decisions [40]. Increasing decision effectiveness or efficiency are the typically expected benefits of DSS [67]. Therefore, previous studies on DSS success have focused mainly on measures of *decision performance* or *user satisfaction* [10,23,31,33,34,42].

However, literature reviews indicate that DSS have had a mixed influence on decision performance. Some studies reported that DSS positively affected decision performance or user satisfaction, while others found no impact or even a negative impact on decision performance (e.g. [9,24,25]). These conflicting results imply the existence of additional considerations when decision-makers decide to use DSS. Recent developments in regret theory provide an alternative view for measuring DSS success.

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Individuals frequently feel disappointed following a decision is made, when they overlooked or neglected a better choice. Regret analysis investigates the role of psychological feelings following the failure to choose the best alternative and how the feelings may affect subsequent decision behavior [7,43,68]. Landman [44] defines regret as:

> Regret is a more or less painful cognitive and emotional state of feeling sorry for misfortunes, limitations, losses, transgressions, shortcomings, or mistakes. It is an experience of felt-reason or reasoned-emotion. The regretted matters may be sins of commission as well as sins of omission; they may range from the voluntary to the uncontrollable and accidental; they may be actually executed deeds or entirely mental ones committed by oneself or by another person or group; they may be moral or legal transgressions or morally and legally neutral (p. 36).

The theory investigating the phenomena is known as *regret theory* [48]. Inman et al. [36] proposed a generalized utility model to illustrate the effect of post-choice disappointment and regret. The proposed model considers both chosen and forgone alternatives as the basis for valuation. The results demonstrate the existence of post-choice regrets, the negative effects of which may exceed the positive impact of rejoicing. Since regret is annoying, most people are willing to take positive action to avoid it [7,8].

The influence of regret on human decision behavior has been reported in numerous areas, including negotiation [45] and consumer behavior research [63]. Seeking the best alternative under uncertainty is generally associated with a high risk. Decision-makers face a trade-off between decision benefits and risk. However, decision-makers tend to make choices that minimize regret rather than risk if the emotional consequences of decisions are anticipated and considered [45,73]. In other words, anticipated regret avoidance may enhance the motivations of manager to use DSS.

Regret avoidance behavior can affect human decisions in that individuals may reject decisions if they feel that those decisions are likely to cause regret [27] and the anticipation of regret may affect the decision process [7,48,63]. Business practices commonly take advantage of regret avoidance in many countries. An example is companies allowing merchandise to be returned with no charge within a certain time period. This grace period increases customer likelihood of purchase by reducing the potential for regret. Given the important influence of regret in decision-making, it is interesting to study whether regret avoidance can be used as an additional dimension for assessing the value of DSS and how this compares with the traditional measure of user satisfaction.

This study investigates how DSS use affects decision regret, which includes DSS use as an independent variable, user responsibility as a moderating variable, and three dependent variables, namely decision performance, user satisfaction, and user regret. The experimental results show that DSS use could enhance decision performance and reduce user regret, but good decision performance does not always guarantee high user satisfaction. Therefore, decision regret should be included in the assessment of the value of DSS.

The rest of this paper is organized as follows. Section 2 briefly reviews literature on the evaluation of DSS. Section 3 then describes the research framework and hypotheses of this study. Next, the experimental design is described in Section 4. Section 5 summarizes data analyses and research findings. Conclusions are finally drawn in Section 6, along with managerial implications and areas for future research.

2. Measuring DSS success

2.1. Existing measures on performance and user satisfaction

Measuring systems success is important in information systems research. Previous literature used two categories of variables to measure DSS success: *process-oriented*, including frequency or length of system usage, and *outcome-oriented*, including decision performance and user satisfaction [28,35,38,60]. Since the pioneering work on "value analysis" by Keen and Scott-Morton [40], numerous studies have investigated the influence of DSS [1,59] and they adopted various research methods that include case studies, field studies, and laboratory experiments.

Table 1 lists a survey of 18 studies that used various DSS success measures to assess decision performance and user satisfaction. These success measures generally focus on system efficiency or effectiveness [40,59].

Efficiency is process-oriented and is generally measured using decision speed or the number of alternatives being considered. For example, Alter [3] cites increasing decision-making efficiency was one potential benefit of DSS. Moreover, effectiveness was measured by decision outcome, such as the quality or accuracy of decision and user satisfaction. For instance, numerous studies have adopted user satisfaction and/or decision-making satisfaction, decision quality, and business profitability to evaluate DSS outcomes [14,41,49,58,59].