Influence of Various Data Types of Integration on Organizations Operational Decision Making Process / Ronyt Gomez

Summary

The decision-making process is the subject of many studies in a variety of fields such as economics, psychology and more. The world of computing (Human Computer Interaction) has also examined over the years how different users can be assisted in the decision-making process using computerized tools. Providing relevant information for decision making is one way to assist the user in real time. For the past decades, research has focused on developing business intelligence for organizations that enables reports from the data entered into the organization's systems. These products are usually developed for the executive-level in the organizations to support strategic decisions. Operating Systems must take in consideration the needs of the functional level of the organization as they make daily use of the information systems of the organization.

The need is to provide a focused solution that understands the unique information needs of the functional-level users and will be integrated into the operating systems and allow it to get an accurate and fast snapshot when making a decision on a single screen.

This study focuses on the decision-making process of junior employees who make most of the operational decisions on a daily basis and examines a methodology that will examine which types of data should be integrated into the organization's operational systems to maximize support for junior-level decision-making processes.

In this way, it will be possible to empower the junior employees in the organizations and make their decisions data-based and even more effective.

In this study, we will examine the effect of data display on the decision-making process and does the type of data display change the degree of impact on the decision-making process?

For this purpose, we selected three types of information views: a tabular view of the data, a processed and concise information view and graphical data.

The study answers the following questions:

1. Which of the three information views maximally supports the user decision-making process?
2. Is there a relationship between the type of display and the quality of the decision made?
   1. Is there a relationship between the type of display and the length of time it took the user to make the decision?
   2. Is there a relationship between a preferred method of display on the part of the user and the quality of the decision he made?
3. Do and how different types of information affect decision makers differently depending on user characteristics?
   1. Is there a relationship between the age of the user and the type of data display that helps him make decisions?
   2. Is there a connection between the gender of the user and the type of data display that helps him make decisions?
   3. Is there a connection between the user's visual capabilities and the type of data display that helps him make decisions?

To examine the impact of the information display on decision making, we chose to examine the issue in a neutral and intuitive domain that will make it easier for participants in an experiment to understand its purpose - purchasing airline tickets online. We have developed for the experiment an online application that simulates the situation of purchasing a flight ticket and allows to do so with the help of data from previous years presented in different ways: raw-tabular information display, processed information display (minimum, maximum and average price in recent years) and graphical display. The study was conducted in front of 127 users recruited through Amazon Mechanical Turk's mass sourcing platform. During the experiment, each participant was asked to purchase 15 different flight tickets (for different information, with different data) and to use the data displayed on the purchase screen to buy the cheapest ticket available. Upon completion of the purchase of tickets, participants were asked to answer some demographic questions regarding the participant's gender and age and to complete a VVIQ questionnaire to examine the participant's

Library of Information Science
972-3- טלי Bar-Ilan University, Ramat-Gan, Israel
Email: Ruthi.Tshop@biu.ac.il

הספריה למדעי המידע
אוניברסיטת בר-אילן, רמת גן 5290002
Tel. 5318163

www.is.biu.ac.il/library

visual skills. The purpose of completing the questionnaire was to examine whether there was a relationship between user characteristics and preference for a data display method.

The results of the study showed that treating the whole sample as a single division without age, gender and visual abilities differences did not show a significant preference between the different display methods. The division of the sample by characteristics allowed for a different understanding of user behavior:

- Gender background gaps: Process data-type data processing helped women in the decision-making process compared to graphical information display that helped men.
- Age gaps: A graphical information display caused the older group (over the age of 30) to deepen their search to find a cheaper price and the younger group (aged 30 and under) a processed information display caused users to deepen their search and bring better results compared to the graphical display.
- Visual Ability Gaps: For users who received scores indicating higher visual abilities according to Marks' model (Marks, 1973), the graphical display method was considered superior, but in the result test both the graphical display and the processed display improved their performance. In contrast, tabular information caused users with well-developed visual abilities to search more even though they did not get good results compared to the results in the other display methods.

The addition of user characteristics in the analysis of the results showed a difference in the results of the experiment between methods. A user-adapted information display or at least under his control for the purpose of adjusting the data display and selecting the types of information that will be presented to him will be able to maximally support the decision-making process of the low-level echelon in the organizations.

It seems that integrating tools for displaying information as part of an operational system in organizations will improve the operational decision-making processes in organizations, but the display of information should be adapted to the characteristics of the users as much as possible for maximum support. The work presented here should change the approach of tool developers who support decision making in organizations. This work emphasizes that in addition to the importance of how the information is presented to the user, it is important to dynamically adapt the information visualization to the end user.

MMS Number: 9926766910005776