Using Dashboards as tools to improve the process of decision making in heathcare

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Abstract – Dashboards today are the preffered tool for managers in the process of managment of companies. They use comparative tables to improve the process of decision making. The graphical presentation and visualization of data allows quick and effecient viewing of changes, recognition of important information and sometimes viewing the „invisible" in the data.

The aim of this paper is to examine the need for using visual systems in the management process, which will lead to better decision making in Public Healthcare Institutions in the Republic of Macedonia. The aim is to achieve critical decisions to be supported by information received from a dashboard-the visual systems that follows the plan and its execution.

Key words - Dashboards, Health institutions, Decision making

I. INTRODUCTION

Many years ago people were aware that "a picture is worth a thousand words". Therefore efforts were made to apply visualization wherever it is possible. Visualization is an area rapidly developed in recent decades. It is a method that allows the data viewing and with its help the discovery of connections and dependencies between data, i.e. "penetrating" into the data. Visualization can be applied to data from all areas, which confirms its great applicability. With its help, it can be said that the thinking of people has changed and visualization has become a preferred form of getting information.

In order to have a good and efficient data visualization, data should be well prepared. That process includes the selection of the data that will be subject of visualization and their form of visualization, i.e. their representation.

The use of the graphical visualization involves a number of advantages for usage in almost all branches of science and business, such as reducing the need for time spent for analyzing data and time for decision making, but also reducing the number of required analysts. Visual tools have an impact on everyday life through their use in many areas such as art and film animation. It also occurs in all scientific research and scientific hypotheses, which is called scientific visualization. [1]

Visualization can have different purposes depending on what needs to be visualized. The most important goal is making the "invisible visible", i.e. obtaining new understandings, effective presentations of the significant features, more research and use of the data and information.

II. DASHBOARDS THAT ASSIST MANAGERIAL DECISION MAKING

Visual tools that are used today can usually be part of the systems of business intelligence.

Business intelligence is the ability of an organization to collect, maintain and organize data in an appropriate manner in order to obtain information for the management of all levels. This produces a range of information to assist in the building of new opportunities. By identifying these opportunities and implementing an effective strategy, a company can gain a competitive advantage in the market and long-term stability [2].

Today's visual tools are the most desirable tool for managers and analysts of data and information, so with their help the decision-making process is more effective and efficient. These systems with visual tools allow:

"Access easy to read, usually one page, real-time user interface, shows graphical representation of the current status and the historical trends of organizational key performance indicators to provide support for quick decisions that are made according to the view". [3]

III. VISUAL SYSTEM TO SUPPORT DECISION MAKING

The lack of clarity of the reports that managers, for various application areas, recieve, such as comparisons of the planned budget and performing an analysis of drug use by departments and others, led to the detection of the need to create a system of visual support that will be suitable in making decisions.

A visual system is designed to assist managers in decisions making. The visual system administrators will be able to better see the changes, in their part, of the operation and to faster react to those changes. Administrators can select the parameters they need to follow, and it is this dynamic damping system that is desired and use by managers.

In the opinion of the managers of the hospitals, the information obtained from the panels will be useful with the operational control as an opportunity for managers to timely respond to deviations that may occur and contribute to a better and timely decisions in all segments to which the boards operations apply.

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IV. RESEARCH

This research that we have done for this purpose should perceive the need to use flash reports, accurate and timely help in decision-making. Here we must emphasize the need to achieve a good and understandable reports by the institution to operate successfully and achieve positive results. We explored whether and how managers are familiar with the visual systems support the is used and whether such visual systems are used in health care today. Also a prototype software solution is build that is used to improve the decision making process.

The need for which this research is made is the lack of clarity of the reports that healthcare managers receive for various application areas, such as comparisons of budget planned and performed, the analysis of drug use and other departments. As under investigation, dashboard applications improve the decision-making of health managers. The purpose of this paper is to highlight the need for a visual system to support decision-making, and the construction of a visual and practical system to show its benefits for the health organization.

The case study is performed in a public hospital in the Republic of Macedonia. The information system that is used is installed in most public healthcare institutions in Macedonia. The information system is actually a set of different systems that use different databases that are placed on different platforms (Microsoft, Linux). Some of the systems used are unrelated. Because each system separately receives reports. The reports are printed tables that are bulky and difficult to read. From them we can't quickly recognize information even though they contain a lot of information. The questionnaire was completed by administrators – managers in several public healthcare institutions in Macedonia (in order to obtain reliable information about their preferences and information needs) a framework for research is defined.

V. ANALYSIS OF THE RESULTS

In the survey 76.2% of respondents answered that they always need to get quick, accurate and timely reports that help in the decision making, 19% said that they usually require obtaining fast, accurate and timely reports and 4.8% said they sometimes require getting fast, accurate and timely reports. None of the respondents answered that he needed very little or never to obtain reports. (Fig.1)
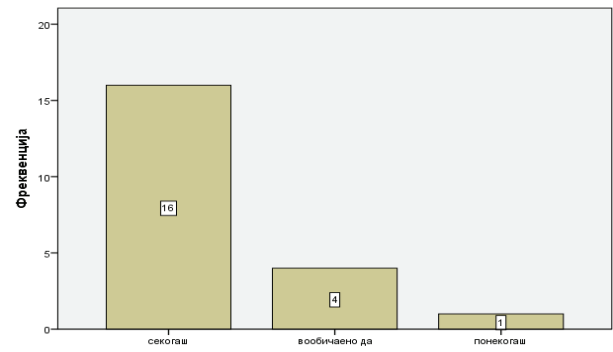

Fig.1. Division answers for the need for fast, accurate and timely reports that help in decision making

For the question "how often do you usually receive reports?", 61.90% of respondents said that they received reports daily, 28.57% answered that receive reports weekly, while 9.52% said that they receive reports monthly. None of the respondents answered that receive reports quarterly or annually. (Fig 2)
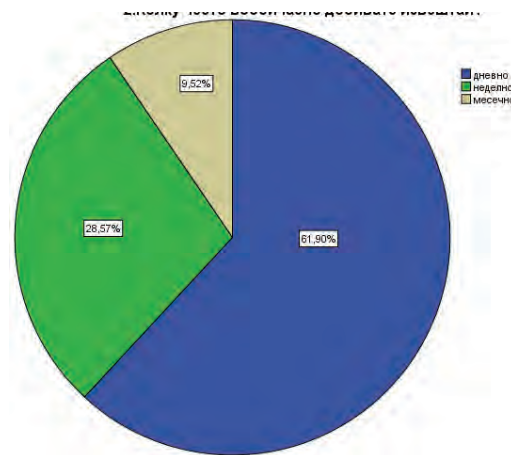

Fig. 2. Division answers of how often managers receive reports

According to the answers, 42.86% of the respondents said that the received reports always help in the decision making process and meet their requests for information, 52.38% said that the received reports usually help in the decision making process and meet their requirements information, while 4.76% said that the received reports sometimes help in the decision making process and meet their requests for information. None of the respondents replied that the received reports help very little or never. (Fig. 3)
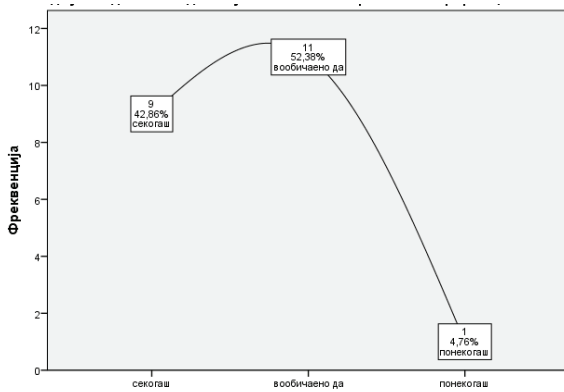
Fig. 3. Division answers about whether received reports help in the decision making process and satisfy the information requirements

Of the respondents, 66.7% said that getting good and understandable reports that help in the decision-making process is always necessary for the institution to work successfully and to realize positive results, 33.3% said that getting good and understandable reports that help in the decision-making process is usually necessary for the institution to work successfully and to realize positive results. Nobody responded that obtaining good and understandable reports that help in the decision-making process sometimes are very little or never necessary for the institution to work successfully and to create positive results. (Fig 4)
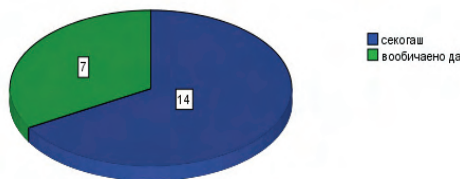

Fig. 4. Division answers about whether understandable reports are necessary for positive results and success of the company

According to the survey, 52.4% of the respondents said they think they know what are visual systems for supporting decision-making, 23.8% said that they know well what visual systems for supporting decision-making are, 14.3% said they knew little, 9.5% said they heard about the visual systems for supporting decision-making and no one answered that they had not heard about them. (Fig 5)
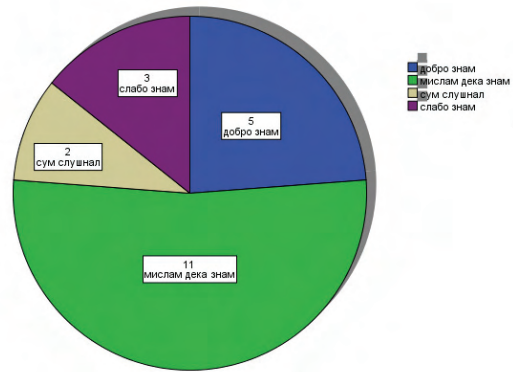

Fig. 5. Division answers for whether managers are familiar with the visual systems to support decision-making

From the obtained answers, 42.9% of respondents believe that the use of visual systems for supporting decision-making will certainly advance the overall operation of the institution, 47.6% believe that the use of visual systems for supporting decision-making can improve the overall operation of the institution, 9.5% do not know whether the use of visual systems will improve the operations of the institution. Nobody believes that the use of visual decision support systems will help to advance the overall operation of the institution. (Fig 6)
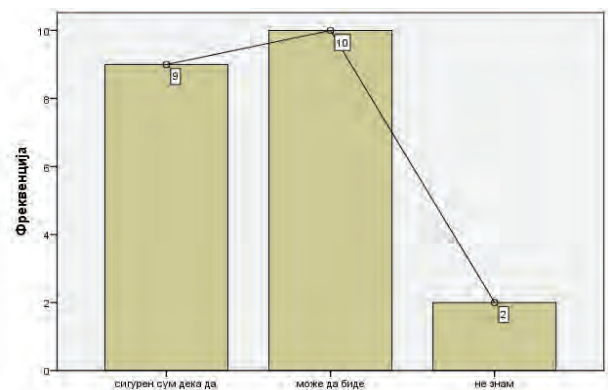

Fig. 6. Division answers for whether the use of visual systems can afford to improve the operation of the institution

Of respondents, 57.1% think they will accept to implement and use visual systems for supporting decision-making, 19% will certainly accept the implementation and use of visual systems, 14.3% would try to accept the implementation and the use of visual systems, 9.5% do not know whether to accept the implementation and use of visual systems. (Fig 7)
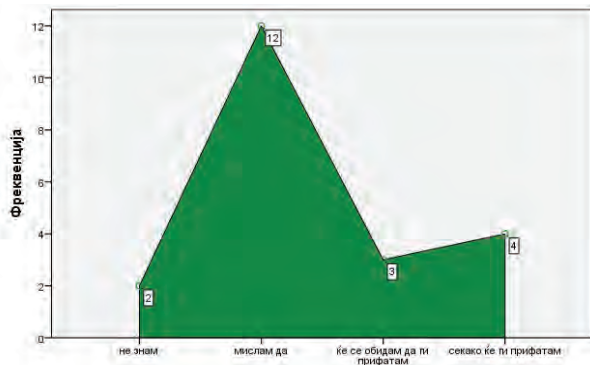
Fig. 7. Division answers for whether managers will accept to implement and use visual systems for support decision-making

All respondents said they do not use the visual system for supporting decision-making in their work.

VI. CONCLUSION

Fact-based research to conclude that managers have a continuing need for fast and accurate reports, and visually see the changes and make better decisions. Reports now are not sufficient for the timely detection of changes and improving decision making.

Managers, according to research, are not sufficiently familiar with the visual systems for supporting decision-making. The concept of these visual systems should be broader, managers need to learn about this concept and understand the need for its use.

The future of improving the decision-making process is in the use of such visual systems. It will improve the functioning of healthcare institutions that will lead to improvement of services and institutions with increased health benefits. If they react quickly to changes, the health institutions will only progress.

The implementation of visual systems in all public healthcare institutions in Macedonia requires time and expertise of the employees in the information area. First they need to create dashboards that will be useful for all administrators and will be created for each part of the operations of the institution. Because the health care facilities have a variety of data to all parts of the operation, creating a system will be a laborious process. But when once established, it can be used in all public healthcare facilities. The benefits that the visual system will bring are much greater than the time and cost of creating such a system.

Once the visual system is developed and implemented, it is necessary to train managers to use. If previously managers understand the need and usefulness of the system, they will be motivated enough to use that system. Using the system is simple. Administrators simply choose which control tables to view data from and visual system displays them. With this change in the operation of the healthcare institution is detected early, and appropriate actions are taken promptly.

As a recommendation for further research I think the concept should be extended to all public healthcare

institutions in the Republic of Macedonia to get the data that managers want to see in these control panels and part of the operation of a visual system need. Once you collect and process the data, you need to create a system that meets the needs of all managers and the same visual system needs to be implemented in all public healthcare institutions in Macedonia.

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