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### **RESEARCH ARTICLE**

## **Impact on the Performance of Operational Dashboards Production Managers in Small and Medium Enterprises**

**Kamaleddin Rahmani<sup>1</sup>**

**Atefeh Asil<sup>2</sup>**

**Naghmeh Khabazi Kenari<sup>3</sup>**

**Abstract** – The present study has sought to investigate the effect of using operational dashboard on the performance of the production managers in small and medium companies. Through a causal or after-occurrence process, this paper has tried to address the problem a show the performance of the production managers in small and medium industries is affected by the application of operational dashboard.

For the purpose of this study, our considered statistical society is supposed to be composed of several small-scale and medium-scale production industries in Iran, for which straightforward random sampling has been performed. The related information has been gathered through our suggested author-made questionnaire and has then been analyzed using 19spss. Based on the results, application of the operational dashboard may affect the performance of the production managers at the 5% safety level.

**Keywords** – dashboard, small and medium industries

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1 Department of Management, Tabriz Branch, Islamic Azad University, Tabriz,Iran

2 PHD student of industrial management, Science and Research University in East Azarbaijan Province

3 PHD student of industrial management, Science and Research University in East Azarbaijan Province

## **Introduction**

Nowadays, the management of any given company requires the constant and fast representation of the information from the data so that the company can be controlled at an optimal level. In this context, operational dashboard is an information system of this kind, which is composed of qualitative and quantitative financial indexes. In other words, using the operational dashboard, considerable pieces of information are put together which are easily and quickly comprehensible for anyone who reads them. Due to the fact that items of information are so variable and since the quality of decision-making and access to information may affect the performance quality, it is required that the information be reliable, up-to-date, and accessible, and hence it seems that performance dashboard is more efficient.

Along with the increasing development and evolution of information technologies, the volume of organizational exploitation and investment concerning such technologies has also increased. Growth and profitability of many modern successful companies is largely assumed to be due to their constant investment in the field of information technology and similar technologies, and thus they are obliged to supply the higher levels of organization to meet the requirements of such effective organizational field [1].

### Statement of research problem

Robert Symons in his famous book, entitled *Performance Measurement and Control Systems*, has suggested that a large volume of operational data are daily recorded and saved in informational systems, some of which are unimportant to the management. Acquiring of some key information which helps the management in making appropriate

decisions is the main responsibility of any performance measurement and control system [12].

In most companies, informational systems well support the current organizational operations such as processing of orders, accounting documents, warehouse management, logistics, etc. However, no information concerning how to improve the organizational procedures is given by these systems to the management of the company. Although the programming systems of organizational resources may offer clarity to the current procedures between different organizational parts, they cannot afford to create the analytical awareness required for the management of the organizational performances [2].

The programming systems of the organizational resources provide the organizational management and staffs with a lot of information; however, they do not necessarily create the required awareness for making better decisions by the organizational management [3].

On the other hand, with the rapid increase in the data collection with regard to the world market growth and customization, decision-making process requires more speed and precision. As the organization grows, the required data for decision making in the organization also increase so that the collection and analysis of a great deal of information can be a hard task [4]. Besides, the executive manager of the company wants to make decision based on the data criterion and needs to take a long path for gathering and comparing the data from different points [5].

Many different data systems currently exist, which are used in the decision making processes by the organization [6]. Robert Symons believes that the aim of all

performance measurement and control systems is the data processing and attainment of the key information for the organizational managers [9]. It seems that performance dashboard is a tool for the control of practice and responsibility. The dashboard helps to optimize the business procedures and provides a better understanding of vast amounts of data at different levels depending on the related requirements [7].

If the new management requirements are measured by the facilities provided by the dashboard, it can be observed that the dashboard is a proper tool for the management. As an example, the new management is time variable and requires a particular attention to the environment and attainment of information in each part, and hence the attention deficit may occur. However, the dashboard involves a quantitative reaction time, analyzes the data rapidly, is an internal and external characterization tool with high flexibility, and can be considered as an index for the performance measurement [8].

The main functions of dashboard in the organization are as follows.

- Giving information to the management concerning the part under their supervision
- Giving information of performance in the graphic format allows the users to realize rapidly the problems related to the performance.
- Warning in any undesirable condition and in case of normal deviation
- Evaluation of the obtained results to achieve the goals
- Making decision on the performance, that is, the related information is sent to the managers at different levels of the organization in due time and hence the managers are allowed to make proper decisions.

- Performance information analysis in an organized way in terms of the organizational objectives and goals [10, 11]

A review of research concepts

For realization of the method, first the main parameters are defined.

Small and medium industries: they are (urban and rural) industrial and service units with less than 50 workers [17].

Dashboard: a user interface of the screen involving a given structure, which allow the existing information to be represented in due time using some criteria [18].

Performance dashboard: a collection of informational elements, which must be the basis for the decisions made by the organizational managers. Therefore, the dashboard is assumed to be used as a managerial tool for achieving the predetermined objectives of the organization [19].

Types of performance dashboards used in different organizations: In the related literature and in economic practice, the dashboards fall into different classes based on the considered information. We can categorize the wide range of the dashboards into three common classes as the strategic, tactical, and operational dashboards.

Strategic dashboard provides a list of information with high degree of processing and gives a general perspective on the organizational activity. Besides, it allows for particular decisions to be appropriately made. The provided information is used for observing the organizational development so that the predetermined objectives of the organization can be achieved.

Tactical dashboard provides more details than the strategic dashboard. There are different values and parameters which can be measured by this dashboard, but they all refer to the predetermined objectives.

Tactical dashboard serves the role of facilitator in terms of the relationship between strategic and operational levels.

As opposed to the strategic and tactical dashboards, operational dashboard is used at operational level and results in the enhancement of the existing situation based on the collected information [9].

#### Literature review

Rokart (1979) was one of the first researchers who proposed the concept of management based on the key factors in success. He believed that the organization can be controlled using several key indexes containing the main and significant information of the organization. However, it is a hard task to find some comprehensive criteria covering all the relevant information, and in case such criteria are found their measurement and calculation is hard and requires the existence of appropriate information in the organization. In this view, Rokart designed a method for strategic programming of the systems. He believed that the most important objective of the informational systems is gathering key information for organizational management [14].

The studies conducted by Kawamoto and Meters (2007) – with the aim of projection of the information required by the users in the economic fields related to the construction, design, and proposition of the existing information in the dashboard –suggested a series of success factors so that the dashboard can be effectively used. Some of these factors are as follows.

- Dashboard must involve a logical structure and offer rapid results.
- It must incorporate particular financial and supply operational data.
- Due to the economic variations and new business conditions, it should allow for the modification of the data to a required amount [15].

Through a paper entitled “Cloud service-oriented dashboard for work cell management in RFID-enabled ubiquitous manufacturing,” Meng Cheng et al. (2013) suggested that application of such a system results in a significant increase in the work cell efficiency and work quality, flexibility, and efficiency of decision making.

Few studies have already been conducted to investigate the effect of using dashboard on the organizational atmosphere.

### Methodology

In this paper, the aim of dashboard is the use of the summary report diagrams by the production managers, and the dashboard is of operational type placed on the warehouse system. Through a causal or after-occurrence process, this paper has tried to address the problem as how the performance of the production managers in small and medium industries is affected by the application of operational dashboard.

In this context, the statistical society of the research is assumed to be made of 54530<sup>4</sup> small and medium production industries in Iran. The number of companies which have made use of the software with dashboard in the warehouse was much lower. Among the identified companies in different parts of Iran, a number of 300 companies have randomly been selected.

The data gathering tool is a questionnaire and a number of 300 individuals from the statistical society, who were not involved in the sample, were selected for investigation of the test reliability and the questionnaire was distributed among them. After gathering the hand-outs, the data entered SPSS Software and using Cronbach's alpha method the test reliability was calculated. Due to the fact that the calculated alpha factor was larger than 60%, no question was omitted.

The questionnaire was sent to organizations via e-mail. After the considered questions were answered by the organizations, the results were thoroughly investigated and 277 questionnaires were approved. The coded questions then entered the SPSS 19.

### **Research findings**

Data normality test was performed using Kolmogorov-Smirnov method for determining the appropriate statistical test for verification or refusal of the hypotheses so that the effect of dashboard application on the performance of the production managers in the small and medium industries can be investigated. It was found that the data were normal, and hence Descriptive Statistics was applied for the test of hypotheses.

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<sup>4</sup> <http://www.sme.ir/>

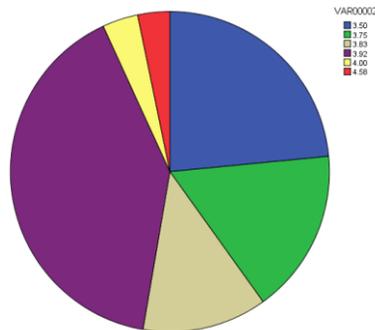
**One-Sample Kolmogorov-Smirnov Test**

		VAR00002
N		277
Normal Parameters <sup>a,b</sup>	Mean	3.8062
	Std. Deviation	.22095
Most Extreme Differences	Absolute	.235
	Positive	.235
	Negative	-.170
Kolmogorov-Smirnov Z		3.905
Asymp. Sig. (2-tailed)		.000

a. Test distribution is Normal.

b. Calculated from data.

Results of SPSS output concerning the variables are as follows.



For the test of hypothesis, it is here assumed that if the average of the obtained data from the questionnaire is 3 or more, the above hypothesis is approved.

One-Sample Statistics				
	Number	Average	Standard deflection	Average standard error
<b>dashboards</b>	277	3.8062	.22095	.01328

$$\mu - 3 = 0 : H_0$$

$$\mu - 3 \neq 0 : H_1$$

One-Sample Test

	Test value = 3					
	Rate of t	Freedom degree	Rate of P in both sides	Differential average	95% فاصله اطمینان	
					Low limit	High limit
<b>dashboards</b>	60.725	276	.000	.80617	.7800	.8323

According to the results from the respondents' opinions, the average is significantly larger than the mean = 3, and the calculated  $t$  at the significance level of 0.05 has a value larger than  $p = 0$ .

Conclusion

Through information collection and analysis of the results of the study, the present paper's hypothesis suggesting the effect of application of dashboard on the production management has been approved. This result is applicable to the small and medium industries and is also valuable because nowadays the management in each company

requires the representation of the fast and continuous information from the data for the control of the organization at the optimum level, and also further importance has been attached to the said issue due the speed of the changes. The results of the present study are in agreement with the results from the paper entitled “Business Intelligence Dashboard in Decision Making (2009) [10].

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