

Basic concepts of quality and standards

Muharrem Bunjaku

Abstract

The basic principle that products and services must meet the basic requirements of users, led to the realization that the specifications that define the product does not guarantee that the product will really achieve the required quality. The comparison between revenues and expenditures is the main form of business accounting and provides evidence of profitability.

The business owner or manager can not have a full understanding of the basic information needed to conduct successful corporate operations without proper use of statistics. Before you start with a new business (start-up) you should prepare a feasibility study and business plan for banks and potential investors in order to secure funding.

Statistical methods and techniques are scientifically based methods and more important in setting the scientific and working hypothesis in planning and experimental research (computer simulation), processing and presentation of the obtained data and making statistical conclusion from this research.

Keywords: Basic concepts, quality, standards.

Introduction

Where competition is very big, markets sets stricter requirements in terms of quality, price and delivery of the product and / or service. Companies need to respond quickly and appropriately and be flexible in its operation. Today one of the main positive attributes that make them highly competitive companies is their flexibility. It is therefore necessary; company to find a suitable way to implement appropriate tools and methods that will help them to increase competitiveness in terms of the ability to realize products and / or services. On the other hand, fully meets the stringent requirements of customers, aims to continuously improve the quality, which is working to meet the needs and expectations of customers by reducing the variability of all processes and improve process capability, increasing the quality of products and / or services.

Quantitative methods enable monitoring of the structural changes of business entities that represents the basis for market analyzes and making business decisions, and is a base for assessment of basic macroeconomic indicators.

Basic concepts of quality and standards

Quality is defined as "meeting the needs and requirements of users," although historically the notion of quality acquired different meanings. The quality of products

or services can be displayed through a mathematical relation as a set of characteristics that a product or service must possess:

$$Q_{p/u} = \sum_{i=1}^n Z_i \times k_i$$

where:

- $Q_{p/u}$ - quality of product or service
- Z_i - significance level of i - characteristics of quality, as the user sees it
- k_i - individual characteristic of quality
- n - total number of characteristics

The quality may be represented by the following relationship:

QUALITY=KNOWLEDGE+PLANNING+DOCUMENTATION (Kulashin D., 2004)

The basic principle that products and services must meet the basic requirements of users, led to the realization that the specifications that define the product does not guarantee that the product will really achieve the required quality.

To reach it comes to the development of standards to define quality system. It facilitates the building of quality system management through manual quality and general conditions that shall ensure that quality is built into the product / service, not (only) to control that level.

The standards define the requirements and determine which elements must include quality systems, and how the company will achieve it depends on themselves and their working conditions.

Roll of statistics in business

Statistical data is essential to business, using it will increase profitability; without profit business are on a road to nowhere. The comparison between revenues and expenditures is the main form of business accounting and provides evidence of profitability.

Statistical process control (SPC) is a term used to describe a set of statistical tools used by professionals. Statistical process control can be divided into three broad categories:

1. Descriptive statistics - used to describe the characteristics and relationships of quality.
2. Statistical process control (SPC) - involves inspection of a random sample selection process and deciding whether the manufacturing process of products with characteristics will fall within the predetermined range answers the question whether the process works properly or not.
3. Acceptance of sampling sample is a random process of inspection, depending on whether or not to accept the decision based on the results.

The role of statistical tools in business

Statistics and analysis of a large quantity of numerical data that are used in the corporate process, provide businessmen with the tools (statistical methods and techniques) to carry out short and long-term processes, plans and marketing research. Reports for profit and loss, system for information management and market share, graphs ... are

just a few tools arising from the use of descriptive statistics. The business owner or manager can not have a full understanding of the basic information needed to conduct successful corporate operations without proper use of statistics. Before you start with a new business (start-up) you should prepare a feasibility study and business plan for banks and potential investors in order to secure funding. Statistics can be used to come up with practical business plan that will interest potential partners or financial institutions.

Some entrepreneurs learn concepts, applications that are related to the use of statistics in order to gain knowledge of how statistical tools could assist in achieving business goals.

Statistical programs such as Excel (or other software packages) are a good way to create and manage database of relevant information. Excel has a series of formulas that can be used to analyze and group data. The purpose of the records and analysis should be found in key areas that affect the profit performance and customer satisfaction. Statistical tools and techniques are easy and practical way to make better decisions in the company.

The application of statistical methods and techniques for business research

Statistical methods and techniques are increasingly used in business surveys in terms of interoperation and transformation of data (raw statistical data derived from the researched process or phenomenon) in metadata, or information (statistical parameters: mean, median, standard deviation and more) by providing for the prediction, projection or simulation.

An important question is what phases of doing research applied statistical methods? Even when choosing a topic for doing research there is a need to determine which statistical methods will be used in the research process or phenomenon, using sources, their availability, measurability, and so on. Further they are important in defining the methodology of scientific research, but applied and in the drafting of the research, collection and processing of the data, preparation of reports and so on.

Statistical methods and techniques are scientifically based methods and more important in setting the scientific and working hypothesis in planning and experimental research (computer simulation), processing and presentation of the obtained data and making statistical conclusion from this research.

Therefore, when choosing which statistical methods and techniques (with proper software support) will be used in doing research, it is the fulfillment of the following assumptions:

- full knowledge of the theoretical concept of statistical methods and techniques applied;
- knowledge of software packages, tools for statistical analysis, on-line statistical applications, etc.;
- knowledge of the structure of statistical databases and similar
- using appropriate statistical terminology and preparation of statistical reports, as well as their interpretation.

Statement of the problem

Company to secure its place in the market has to produce such products and services

that meet the needs and expectations of users. We must meet the needs of consumers and other stakeholders (employees, owners, suppliers, community). However, due to strong competition and the increasing demands of customers for a higher level of quality, if not constantly making improvements, the company can easily lose its place in the market.

The principle of continuous improvement can be implemented if the managers of the business processes have adequate information base, which will allow making business decisions based on facts. Activities that managers of the companies should implement in order to survive and thrive are as follows:

- to manage the processes in the company;
- to monitor their flows;
- to perceive their trends;
- to identify possible problems;
- to analyze the possible reasons for their occurrence;
- take decisions to prevent them;
- to make decisions for continuous improvement.

For all these activities it is necessary to know and right to use certain methods and tools. The task of leadership is to recognize the importance of methods and tools of quality management and proper application to achieve specific Improvements in operation.

Purpose of the Study

The purpose of the study is to determine the relationship of quantitative methods, techniques and tools in the decision making process in all areas of management in companies.

The aim of the research was conducted through multiple tasks: determining the role and importance of quantitative methods; description of quantitative methods and how they are applied in companies; analyzed the correlation of quantitative methods to the quality system; definition of quality management in the context of using quantitative methods; determining the needs for the application of quantitative methods in decision making.

Training of employees in companies using quantitative methods in decision-making process is a challenge of modern business companies, and the design and implementation process of quality management through serious comparative analyzes, such as proper application of information - communication technology represents a problem in modern educational systems.

Significance of the Study

Today, quality becomes a key factor for competitive advantage in the market. In times of high quality products and services and increasing competition in the market, each company must have as its priority to set quality and quality at every level. Quality Management / Total Quality Management / often proved to be an effective process of improvement and operation of the company and its value is confirmed through a comprehensive and well thought out an implementation process. TQM as a series of changes in the process must be understood as a philosophy of work that affect the operations of the company. Quality management as a key resource in the competition

in the market to win customers means a constant search for better techniques, technological, marketing and other improvements and enhancements to enable it to produce the desired result, and that is customer satisfaction. To meet the needs of users should primarily provide quality products and services.

The successful implementation of quality control is necessary to meet the four basic assumptions:

1. to understand the statistical techniques used in statistical methods for quality control;
2. to understand the purpose (meaning) and goals (philosophy) the application of these methods;
3. to understand measurement and control procedures for control used in the process;
4. to ensure that senior management understands the goals that can be achieved by using the methods that enable quality control.

For statistical monitoring of the process, it should establish the following elements:

- one or more key characteristics of quality to be monitored;
- measurement procedure (measuring tool, preferences, location and measurement requirements);
- statistical method;
- size and number of samples (sample);
- frequency of sampling.

Every business process is subject to variability. The variability of the process is considered a normal phenomenon that must be taken into consideration. Variability of parameters in the area of transformation of input sizes in output variability affects the entire business process. All phenomena of variability and later deviations from optimum process does not have to affect the level of quality of the process.

However, if you come to the departure level of quality of the line of optimum process so much that he goes to the allowed tolerances or come from outside the frame, appearing additional costs due (in) - quality.

The process becomes too expensive, threatening the quality of the results, which causes serious questions about the level of customer satisfaction, so it becomes irrational.

Therefore, it is necessary to successfully manage the process in relation to:

- achieving a certain level of ability to process stability and accuracy;
- continuous improvement, as manifested by a reduction of process variability.

The ability to process is dispersion variability of the key features of the process, mathematically speaking, is six standard deviations (6σ), calculated on a sample of individual measurements of the observed features of the process.

Continuous improvement of the ability of the process or the variability of the observed characteristics of the process is reduced to reduce the tolerance limits of the prescribed process. In this way, the accuracy of the process significantly increases despite the elimination of costs due to (lack of) quality. To enable the company to maintain optimum stability of the process and making continuous improvements in order to survive and prosper, management should know and use certain tools and methods in quality management. Without the use of certain methods and tools,

no company can be successful, even if it works, and especially cannot perform continuous improvement and follow the path of business excellence of its system, its processes and products or services.

Conclusions

The need for the methods for statistical control of quality is increasingly arising in companies for assistance and support of the quality management. To be competitive in the market, companies will have to start using, in a greater extent, the statistical methods for quality control in their work. Using statistical methods, if carried out correctly, helps managers in making correct business decisions.

Decision making is the process on which managers respond to the opportunities and threats that they encounter, thru analyzing and applying solutions. Good decisions result in selecting the appropriate objectives and directions of action, which increase organizational performance, whereas poor decisions result in slower performance. Managers are always looking for ways to make better decisions to improve organizational performance.

Using statistical methods are based on three basic principles: the company's business consists of related processes, in all processes there are variations and as key to business success is understanding and reducing variation. Those who "think statistical" and also understand that all around us there are variations and those variations are the main "enemies" of quality.

Information on applying statistical methods in regional companies are very rare so this research is a good platform for further research about the impact of statistical techniques in decision making.

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