

Application of Basic Tools of Experimental Economy in Management Science

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Abstract – In the times of rapid economic transformations taking place in the world markets, it is becoming more and more difficult to predict economic trends as well as people's behaviour. In order to do so, it is more common nowadays to adopt unorthodox approach apart from using traditional methods. Undoubtedly, experimental economy is a good example of such kind of approach. The basic tool used in experimental economy is an experiment and it will be the main subject of this study. In its first part, this article explains fundamental concepts and the essence of experimental theory basing on available literary resources. The second part presents lots of specific examples showing how to use experiments both in human resources management and quality management.

Key words – experiment, experimental economy, Kaizen, PDCA.

I. Introduction

According to the Polish dictionary, an experiment (lat. *Experimentum* – experience, research) is an attempt to implement an innovation idea or a scientific experience which is conducted to explore some kind of phenomenon [1]. In available literary resources it is also defined as: the study of a phenomenon, which consists in intentional causing this phenomenon or changing it and carrying out observations and measurements which allows to draw conclusions about its properties [2]. It is performed in order to confirm or falsify a specific theory. Note, however, that designing experiments is not easy, and a good experiment has to be as simple as possible in implementation and give the most unambiguous answer. However, very often in practice it happens that an apparently failed experiment (which got out of control and did not give a clear answer to a question established earlier), became the beginning of the development of a new discipline or brought a new discovery, e.g. penicillin or X-ray radiation [3]. The aim of this article is to present an experiment as a basic research tool in economics, as well as the use of it in management sciences, with particular emphasis on quality management.

II. Experiment in management sciences

According to Griffin, management is a set of actions aimed at human, financial, material and information resources in order to achieve pre-determined goals in an efficient and effective manner by the organization [4]. Management includes four basic functions (picture below presents interconnectedness between these functions):

- planning and making decisions – aims of the organization are formulated the way of their realization
- organizing – activities and resources are coordinated which allows for the realization the pre-determined aims

- leading (motivating and managing people) – a set of processes used to encourage people to work for the organization
- control – observing progress in terms of the pre-defined aims in the organization [5]

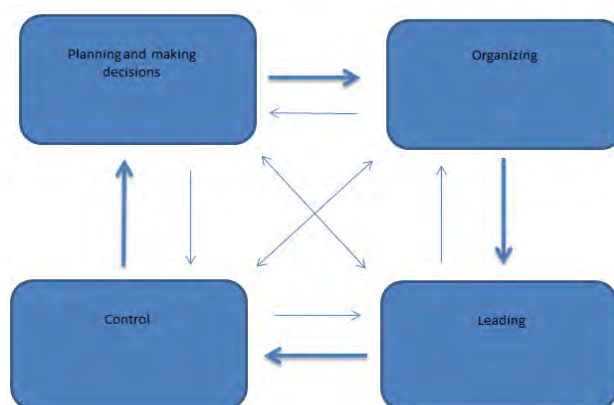


Fig. 1. Connections between management functions

Source: Griffin R.W. *Podstawy zarządzania organizacjami*, Wyd. Naukowe PWN, 1998, s. 40

Experiment in management is commonly used because of its broad application. An example of that are studies which were carried out in years 1922- 1932 in Western Electric company in Hawthorne by Elton Mayo with his associates. The first research was about changing the workplace illumination for a selected group of workers and comparing the results of implementation of that change. It seems that the performance of that group improved and curiously the performance also improved in group of workers who worked with unchanged illumination. Furthermore, this performance improvement stayed on the same level even after returning to the previous lighting conditions. Performance declined when illumination was reduced to a level similar to moon light [6]. The experiment in this case failed, because the main role in this research was played by supervision of researchers. Workers felt pressure so they worked harder to work than usually.

Another interesting experiment conducted in management was establishing a plan of piece-work incentive for a group of ten workers who were responsible for assembling parts for terminals of telephones. Mayo and his associates wanted to check the theory of management which claimed that employees always aim at maximizing their salary by producing as many units as possible. Researchers assuming that the group of workers will informally determine the appropriate level of production for its members. Some workers (who were called „naganiaczki”) exceeded the internal norms, while others (who were called „dłubaczki”) produced less. However, the latter tried to produce the establishment number of products, because they wanted to gain acceptance other workers – after producing the expected limits they slowed down [7]. In this case piece-work system did not work properly due to the fact that salary seems to be less important than the needs for social acceptance.

Another important experiment and also one of the most famous experiments in the world conducted in

management was carried out in a small Brazilian company Semco. Semler R. inherited his father's company, which produced high-quality industrial machines and provided specialised engineering services.

The first decision of the new owner was to dismiss two-thirds of the old board and to implement new rules: production workers had to determine on their own the starting and finishing hours of work, they had to strengthen the sense of honour and mutual trust (lack of internal audits), employees were able to choose their leaders in order to realize projects which really interested them, as well as deciding about matters in the company which are usually only in the competence of the company's board. The company initially employed about 90 people, but nowadays the number of employees is more than 3 000 people, and it consists of ten business units [8]. Additionally, Semco is one of the most desirable employers in Brazil with a group of dedicated and loyal employees [9].

On the basis of those examples above it can be seen that the basic tool of experimental economics is also used in other sciences. Below are some examples which show that experiment is also a useful tool in quality management.

In quality management there are a lot of tools, methods and systems which can be used to conduct an experiment. Here are some of them:

PDCA (Plan, Do, Check, Act) – it is an algorithm of gradual changes of the company's system; above all, the idea is to gradually and systematically make changes, which creates an opportunity to observe them. The experiment in this part consist in carrying out planned activities because there are totally new and in the second part the results are checked.

Kaizen – it is a kind of philosophy, which means a change for the better. It includes the involvement of all employees. It involves the gradual improving some kind of the company's activities (sometimes through minor corrections), which many lead to better productivity, efficiency and quality of products by the company. The aim is achieve long-term success by means of small steps [10]. Implementing Kaizen to European reality is extremely difficult because of cultural difference between Europeans and Japanese. This experiment does not always bring positive results in European enterprises because its success depends on the mentality of people (managers should develop cooperation with employees so that they are willing to share their ideas and suggestions without feeling any fear connected with lack of acceptance) [11]. Esselte Polska is an example of a company where the Kaizen philosophy was implemented. Initially this company generated high costs of storing final products. Thanks to arduous and long-term implementing Kaizen (analysis the whole process – putting on foil on specific

machines and measuring the number of steps taken the machine's operator etc.), the company improved flexibility, efficiency and economic capacity.

Conclusion

The above examples can demonstrate that an experiment is a commonly used tool in experimental economics. Experiments can be conducted for different purposes and explore different kinds of relationships between dependent and independent variables (establish relations between causes and effects). This article proves that experiments are a useful tool in economics, human resources management (Semco company), quality management and in many different disciplines of social sciences.

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