MODERN APPROACHES TO QUALITY MANAGEMENT OF AGRICULTURAL TECHNOLOGY

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Abstract: The report analyzes the place and role of the problem of quality and reliability of production / agricultural machinery / under the conditions of the market economy is the basis of marketing and business. In a market economy the main driving forces of the business are: marketing, quality and reliability of production and services.

It turns out that we need to change our way of thinking and action. We must get used to the idea that the marketing approach and innovative solutions challenge the consumer to produce and service high quality and reliability. The report analyzes the place and role of the problem of quality and reliability of production / agricultural machinery / under the conditions of the market economy is the basis of marketing and business. In a market economy the main driving forces of the business are: marketing, quality and reliability of production and services.

KEY WORDS: MARKETING APPROACH, RELIABILITY, QUALITY, STANDARDS, MANAGEMENT, MODELS, MANAGEMENT SYSTEMS, STANDARDIZATION.

The place and role of the problem of quality and reliability of production under market economy conditions is the basis of marketing and business. In a market economy the main driving forces of the business are: marketing, quality and reliability of production and services.

In a market economy, it is not possible to impose low-quality products, low levels of reliability and low prices. The non-market economy elements were: quantity, price and quality. These priorities have to change in a market economy and go from reliability and quality, through the supply of spare parts, maintenance, and only then we can talk about the price of the produce or service.

The approaches to changing the quality and reliability management system known so far are related to the names of world-renowned scientists (Figure 1):

A) Taylor's approach: specialists are at the heart of managing the quality and reliability of production and services;
B) Demping and Joran Approach: Specialists and managers are the main drivers in the system of quality management and reliability of production;
C) Kaoru Ishikawa's approach: specialists, managers and workers are at the heart of quality management and reliability.

These approaches can be complemented by another approach, namely: Approach of 21st century: scientists from the research institutes (R & D) and higher education institutions (HEIs) are added to the specialists, managers and workers, but to change the management system Of education services - the labor market. Yes, the labor market is a driving force and HEIs have to take into account the demand for specialists with a certain type of qualification. This requires from HEIs very good marketing and quick re-engineering of its work, opening new specialties and specializations, introducing new courses. There has long been a time when a teacher completes his career by reading the same lectures for 25-30 years. User requirements towards products and services are changing and the HEIs has to keep pace with these changes.

Three strategies for standardization, marketing and innovation are known for managing the quality of products and services.

• Standardization strategy - To market a type of product or service, it must meet the requirements of the country standard;

Marketing strategy - To market a product or service, it is necessary to investigate what product and service are sought and offered on the market;

• Innovation strategy - to offer products and services that consumers did not expect, with better quality and reliability. The consumer must be provoked by quality production and services, and this is achieved by introducing new innovative solutions, new materials, new technologies, and so on.

According to Kaoru Ishikawa, the prosperity of a company depends on the time it will go from standardization to marketing and reach the innovation strategy for quality management of products and services. The rapid transition to the innovation strategy is a guarantee for the company's high business performance.

Why should we strive to raise the level of quality and reliability of products and services?

Micro and macro economies are known to be the drivers of demand and supply in a market economy. But only by raising the level of quality and reliability of production, demand increases, hence the volume of production and the profit from the realization of production.

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Reliability is a change in the quality characteristics in function of time, i.e. Reliability is a manifestation of quality over time. It is the "dynamics" of quality. The low level of quality of production and services means low competitiveness and return, high operating costs and leads to the scattering of national resources. Improving the quality and reliability of production is a prerequisite for better use of production capacities, saving raw materials, materials, fuels and ultimately boosting labor productivity. Therefore, striving must be at the optimum level of product reliability.

Figure 2 gives the relationship between properties, indices, characteristics, states and events in the theory and practice of product reliability. This formulation is fundamental in theory and must always be respected, as otherwise absurd situations where attributes are mixed with indicators, and practitioners are in fact misleading.

![Fig.2 Relationship between features, indicators, characteristics, and states: C-states; C6-events; B-flawlessness; T-durability; P-repairability; C-shelf life; Cm-stability.](image)

Depending on the type of production (object) and the nature of the tasks, one or other features, indicators and characteristics are selected.

In order to ensure a consistent level of quality and reliability of production, it is necessary to implement and certify a quality management system, complying with the requirements of the international standard ISO 9001:2015.

A quality management system is not a mountain of unnecessary documents but a way to fully realize the principles of quality management in the organization's activity.

The Quality Management System is a system of procedures, rules, information, resources, people, etc. that interact within the organization to identify and achieve quality objectives. According to the contemporary perspectives, the management of quality implies the availability of a number of elements that allow the full quality management to be realized. These elements include:

- quality policy;
- quality planning system (setting quality objectives, identifying the necessary resources, etc.);
- process model of the organization (description of processes, block-schemes, procedures, instructions, etc.);
- quality control system (of incoming resources, semi-finished products, productions, processes, etc.);
- User satisfaction monitoring system;
- internal quality assurance system;
- system for management of process and production quality information (quality records);
- quality analysis system by management;
- Continuous improvement of quality system;
- management of discrepancies;
- corrective impacts;
- Warnings;
- external impact management system.

The architecture of the quality management system and the specific ways of using its elements in the particular organization depend on its scale, profile, structure, culture, style of management, goals and other factors. Therefore, we can speak that there is a formulated summary model of a quality management system that has also been reflected in international ISO 9000 standards (Figure 10).

![Fig.3 The main scheme of the quality management system and the interconnection requirements of the users and their satisfaction with the level of the quality of the products and services](image)

Quality management system certification is a non-organization action. It is called upon to demonstrate the ability of the organization to provide and continually improve quality. Once established a quality and service management system and certification should not be considered as something that cannot be changed. The requirements of the ISO 9000 series standards provide for continuous improvement and quality improvement to meet the needs of consumers. To meet ever-changing requirements. This requires continuously implementing the Deming principle: Plan; Perform; Check; Act.

An important role in maintaining and improving the quality of production is also the proper and regular implementation of the quality management system audit. One of the main elements of the quality management system is the application of modern statistical methods for control and management of the level of quality. In Bulgaria there is a lack of confidence in the use of statistical methods for control and management of the level of production quality.

Conclusions:

First, product development, in particular, agricultural machinery and quality management system certification, does not take into account that achieving a high level of quality does not mean a high level of reliability over time.

Secondly, the problems of reliability in our country are not discussed and are not studied in HEIs thoroughly enough. In a HEI where reliability is taught, they are separated for several hours, at the end of the curriculum, in different disciplines, and usually there
is no time to study them. The International Standardization Organization introduces ISO 31000 standards that address the risk of design, construction, production, operation, and process risk, workplace risk, food risk and planet health. The entire set of standards is based on probability theory, mathematical statistics and reliability theory.

Thirdly, we need to change our way of thinking and acting. We have to get used to the idea that there is no mass production where everything is done on demand, where three kits dominate: time, money and repeatability. We need a marketing approach and innovative solutions to push the user to products and services with high quality and reliability.

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