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.

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 be changed 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.

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.

The structure and elements of the theory and practice of product reliability are presented with: a concept of reliability; Mathematical theory of reliability; Physical theory of reliability; Theory of reliability testing methods; Theory of methods for enhancing, ensuring and maintaining the level of reliability; Theory of organizational methods and reliability economics.

The quality of products and services is a combination of properties that meet the needs and / or requirements of consumers and the reliability-complexity of maintaining the quality level within established limits, time, mode and conditions.

The properties of quality and its characteristics are reflected in the starting point, i. When production is ready for market placement, and reliability as a complex property is manifested in the process of using the products and services. It is known that not always a high quality of a guarantee of a high level of reliability during the use of the product or service. The quality and reliability of production are expressed by a large number of properties, features and characteristics. Their use without systematized grouping and classification is associated with certain difficulties. In the literature and in the normative and technical documentation, the properties, performance and quality and reliability indicators and characteristics are not systematized and are not related to each other, and the indicators and characteristics are mixed and expressed only as indicators.

Quality is a combination of properties that meet consumer needs and / or requirements, and reliability is a complex feature to maintain quality levels within established limits, time, mode and conditions. The main elements of the conceptual definition of quality are properties, needs and requirements. Quality properties are expressed by specific and complex indicators, and indicators with numerical and functional characteristics.

Consumers' needs are diverse and complex. Depending on the cultural level, they are expressed by different needs that can be
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, and states: C-states; C-states; B - flawlessness; T - durability; P - repairability; C-shelf life; Cm-stability.

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, product development, in particular, agricultural machinery.

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.).

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.

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

**Literature:**
1. Тасев Г. Механизация на земеделското производство.-С.,2014.
2. Георгиева К. Съвременни механизирани технологии в земеделието.-Ямбол,2015.