THE PRICE OF ENGINEERING PRODUCTS AS A TOOL FOR STRATEGIC DIFFERENTIATION

V. MELNYK, PhD in Economics, Associate Professor,
National University of Life and Environmental Sciences of Ukraine

In some cases, a high price can be used as a tool for strategic differentiation, where companies position their products as premium-class and create an impression of exclusivity, advanced technologies, and innovation for consumers. In the production of complex machines for the energy or industrial equipment sector, companies may target a specific market segment where price is not the main barrier to purchase. For example, products from Siemens (Germany) or General Electric (U.S.A), such as gas turbines or power plants, may have a high price due to advanced technologies and high efficiency, making them attractive to large enterprises seeking an optimal balance between cost and performance.

Thus, the price is an important factor of competitiveness as it directly affects the demand for products. In the engineering industry, the price should consider not only the production costs but also other factors such as innovation, quality, reliability, and service.

A high price can be justified in the high-tech market where products have unique features and high efficiency, such as in the aviation or energy sector. Competing through price reduction is effective in markets where product accessibility is important, such as in the agricultural machinery or standard automotive markets. Price and after-sales service are crucial factors in determining competitiveness in the engineering industry, where durability and service can influence consumer choice even with a high initial price. Overall, effective price management and its combination with other product characteristics are the key to a successful competitive strategy in engineering.

Agricultural engineering is an important industry that ensures the efficiency of agricultural production. The main tasks of enterprises in this sector are to create equipment that helps reduce the costs of soil cultivation, harvesting, and other operations while providing high productivity and reliability.

Cost reduction is an important task for any manufacturer, as it allows reducing the cost of production, making it more affordable for the end consumer, and increasing competitiveness in the market. However, in agricultural engineering, it is important to maintain high equipment quality, as it must withstand harsh operating conditions, have high reliability, and durability.

The main problems of cost reduction without loss of quality can be grouped into the following areas: choice of materials; automation of production processes; optimization of logistics and supply; energy saving and environmental friendliness.

Reducing the cost of raw materials and materials can lead to a deterioration in product characteristics such as strength, durability, or corrosion resistance. For example, using cheaper materials for the manufacture of important parts of combines or tractors can reduce their efficiency and increase maintenance costs.

The introduction of new technologies and production automation can significantly reduce labor costs and increase the precision of part manufacturing. However, high initial investments in equipment and software can be a barrier for small enterprises.

Optimizing the supply chain and reducing transportation and storage costs for components can help reduce overall costs. However, any changes in supply must be carefully planned to avoid delays and shortages of necessary materials.

In agricultural engineering, it is also important to consider energy consumption and emissions costs. Equipment manufacturers aim to reduce energy consumption and improve the environmental characteristics of their products, which in turn can impact production costs.

Agricultural engineering is one of the industries where the implementation of new technologies can significantly reduce costs while maintaining high equipment quality. Innovations in technological processes, as well as in the materials and designs of agricultural machinery, contribute to increased efficiency and reduced overall production and maintenance costs.

Some of the new technologies used to reduce costs include additive technologies, intelligent control systems, energy-efficient solutions, automation and robotics, digitization, and data analysis.

Additive technologies (such as 3D printing) allow the manufacturing of parts and components of agricultural machinery through three-dimensional modeling. This reduces the costs of producing complex parts that would require significant material and manufacturing expenses using traditional methods. For example, companies like FarmBot (Poland) and Prospera Technologies (Israel) use 3D printing to create part models, reducing production time and allowing the production of less expensive prototypes. CNH Industrial (Netherlands), which specializes in the production and sale of agricultural and construction equipment under brands such as Case IH, New Holland Agriculture, Steyr, Case Construction Equipment, and New Holland Construction, actively uses additive technologies for manufacturing specific components. This reduces prototyping and design detailing costs while maintaining high product quality.

Installing intelligent control systems on equipment allows for fuel cost reduction and increases machine operation efficiency. For instance, using GPS systems and automatic control systems helps optimize equipment movement in the field, reducing fuel costs and improving operation accuracy. For example, tractors and combines equipped with GPS navigation and automatic control systems developed by Case IH can automatically adjust the direction of movement and soil processing, leading to fuel savings and reduced wear and tear.

Implementing technologies to reduce energy consumption has significant potential for cost reduction. High energy efficiency of equipment helps reduce operational costs, especially considering the rising cost of energy resources. For example, new generation tractors equipped with fuel consumption regulation systems, such as New Holland T7 produced by New Holland Agriculture, help reduce fuel costs, an important factor in reducing operational costs in agriculture.

Automation of production processes at agricultural machinery factories significantly lowers labor costs, reduces product defects, and increases production rates. Using robotic lines in production also helps improve assembly accuracy and reduce production time. For example, Kubota (Japan) applies automated lines at their factories for assembling tractors and mini-combines. They use robotic systems for precise component assembly, which helps lower production process costs and ensure consistently high product quality.

The use of big data analytics and the Internet of Things (IoT) enables farmers and machinery manufacturers to make more informed decisions, leading to reduced maintenance and repair costs. For example, using sensors on equipment allows for the monitoring of critical component conditions and predicting their wear, preventing unexpected breakdowns. For instance, John Deere (U.S.A) offers farmers monitoring and analytics systems that allow tracking the technical condition of agricultural machines in real-time, predicting component wear, and planning their replacement before a serious breakdown occurs.

Therefore, cost reduction without loss of quality is a challenging task for agricultural engineering enterprises. However, implementing new technologies helps address this challenge. The use of additive technologies, intelligent control systems, energy-efficient solutions, and production process automation significantly reduces equipment production costs, increases its efficiency, and maintains high quality. At the same time, these innovations allow agricultural machinery manufacturers to remain competitive in the market and meet modern consumer requirements. Thus, cost reduction without loss of quality through the application of new technologies is an important development direction for agricultural engineering in the context of the modern economy.

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
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