

DETERMINING THE BALANCE BETWEEN COST AND QUALITY OF ENGINEERING PRODUCTS

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A crucial issue for enterprises in the engineering industry is finding the balance between costs and product quality. This can be achieved through analyzing production costs and the prices of similar products available in the market. By following this path, manufacturers of engineering products must carefully analyze all production-related costs to establish a competitive price that covers all expenses and ensures a profit. For example, in the production of turbines or heavy machinery, it is essential to consider not only raw material costs but also the complex setup of equipment, testing, and certification.

Another option to solve this problem is to make continuous investments in new technologies and improve production processes, which allows optimizing costs without significant quality reduction. For example, in car manufacturing, using new materials or automating production lines can reduce labor and material costs without compromising quality.

The third path is quality management, which involves ensuring high product quality at optimal costs while maintaining a high level of quality control at all stages of production. For instance, the quality control system in companies like Siemens or General Electric includes not only testing at every production stage but also the implementation of modern quality management methods such as Six Sigma.

Examples of finding a balance in the "price – quality" ratio can be seen in well-known engineering companies. Rolls-Royce is an example of a company that successfully combines high price and high quality. Their aviation engines have a high cost due to the use of innovative technologies, materials, and high-quality standards, but the price is justified by the safety, reliability, and durability of the products. Toyota, with a wide range of products from budget models to premium-class (e.g., Lexus), demonstrates the ability to maintain high quality at an affordable price through improved production processes and the use of global suppliers. Caterpillar produces heavy equipment that operates in harsh conditions, and its products are known for high reliability. High development costs and quality materials allow maintaining high quality at high prices.

Thus, in the engineering industry, the ratio of price to product quality is a vital element for achieving competitive advantages. For manufacturers, it is important to find a balance between high costs for innovative technologies and materials and the ability to maintain an acceptable price for the end consumer. Successful companies demonstrate how high quality and efficient cost management can be combined to achieve market success.

As mentioned earlier, the competitiveness of engineering enterprises is largely determined by the price of their products, as price is one of the main criteria by which consumers choose goods. However, unlike many other industries where price may be the main factor, in engineering, it is also essential to consider technical characteristics, reliability, service life, and product efficiency. In this context, price is a component of the company's strategy that affects its competitiveness in the market.

Price plays an important role in engineering as it influences the attractiveness of products to buyers. Consumers, especially in highly competitive environments, often focus on prices. A high price can only be justified if the product meets high-quality standards and has unique characteristics. Price also determines the company's margin.

Obviously, price affects the profitability level of the company. A high price allows for greater profit per unit of product; however, it may reduce demand if the product does not have enough value for the consumer.

If the company can optimize its costs while maintaining a competitive price, it allows it to ensure greater efficiency and a better market position.

Price in engineering is determined not only by production costs but also by other factors such as the level of innovation, brand reputation, after-sales service efficiency, technical characteristics, and product reliability.

Price plays a crucial role in determining competitiveness in mechanical engineering. A high price can be justified for innovative products that offer technological superiority or significantly better performance compared to competitors. In such cases, price does not act as a barrier, as the quality and reliability of the product justify the costs for large enterprises, such as airlines and governmental organizations. For instance, the price of Rolls-Royce aircraft engines may be above the market average, but companies operating in the aviation sector choose them due to their reliability and safety, which are critical in this industry.

Conversely, in many cases, price reduction can be a key factor in competitiveness, especially for standardized or mass-produced products. For example, in the agricultural machinery market, companies can compete by lowering prices or optimizing production costs to make their products more accessible to a broader consumer base. If the American company John Deere reduces the price of its tractors by implementing more efficient manufacturing technologies or optimizing supply chains, it can maintain competitive advantages in a market where price is a crucial factor for budget-conscious consumers.

For mid-range markets, such as industrial equipment or standard automobile production, price must be balanced with high quality. Products that offer a good price-to-quality ratio are often in demand in highly competitive markets where consumers seek the optimal balance between cost and functionality. A classic example of this strategy is the Japanese company Toyota Motor Corporation, which manufactures high-quality vehicles at reasonable prices. Consumers choose Toyota products not only for their affordability but also for their reliability and long service life, making optimized pricing a key competitive factor in the mid-range automotive market.

In mechanical engineering, it is essential to consider not only the initial cost of a product but also its maintenance and operational expenses. Products with a high initial price can still have competitive advantages if they offer cost-effective and convenient maintenance. Companies that provide after-sales service and warranties can set higher prices for their products while remaining competitive. For example, the American heavy equipment manufacturer Caterpillar, Inc. offers a comprehensive service and warranty package, allowing it to maintain high product prices while catering to a market that values machinery with a long service life and low maintenance costs.

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
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«КРАМАРОВСЬКІ ЧИТАННЯ»

***20-21 лютого 2025 року
м. Київ***

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL
SCIENCES OF UKRAINE
INSTITUTE OF MECHANICS AND AUTOMATICS OF
AGROINDUSTRIAL PRODUCTION OF THE NATIONAL
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PROCEEDINGS

*XII International Scientific and Technical Conference dedicated
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Doctor of Technical Sciences, Professor,
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Volodymyr Savovych
(1906-1987)*

«KRAMAROV'S READINGS»

*February 20-21, 2025
Kyiv*

УДК 631.17+62-52-631.3

Збірник тез доповідей XII Міжнародної науково-технічної конференції «Крамаровські читання» з нагоди 118-ї річниці від дня народження доктора технічних наук, професора, віцепрезидента УАСГН Крамарова Володимира Савовича (1906-1987) 20-21 лют. 2025 р., м. Київ / МОН України, Національний університет біоресурсів і природокористування України. К.: Видавничий центр НУБіП України, 2025. 662 с.

Proceedings of the XII International Scientific and Technical Conference dedicated to the 118th anniversary of the birth of Doctor of Technical Sciences, Professor, Vice President of the UAAS Kramarov Volodymyr Savovych (1906–1987), February 20–21, 2025, Kyiv / MES of Ukraine, National University of Life And Environmental Sciences of Ukraine. Kyiv: Publishing center of NULES of Ukraine, 2025. 662 p.

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