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ФАКТОРИ ВПЛИВУ НА ЯКІСТЬ І ВДОСКОНАЛЕННЯ ІТ-ПРОДУКТІВ У ПРОДУКТОВОМУ МЕНЕДЖМЕНТІ

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FACTORS INFLUENCING THE QUALITY AND IMPROVEMENT OF IT PRODUCTS IN PRODUCT MANAGEMENT

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Анотація. *Актуальність дослідження зумовлена зростанням складності цифрових ринків, швидкими технологічними змінами, регуляторним тиском і підвищенням очікувань користувачів щодо якості та зручності ІТ-продуктів. За таких умов продуктовий менеджмент не може спиратися лише на технічне вдосконалення або аналіз ринку, оскільки якість ІТ-продукту формується внаслідок узгодженого впливу низки груп факторів. Метою цього дослідження є систематична ідентифікація та оцінювання ключових факторів, що формують якість і вдосконалення ІТ-продуктів у продуктовому менеджменті. Об'єктом дослідження є процес формування якості та вдосконалення ІТ-продуктів у межах продуктового менеджменту. Методологічна основа дослідження базується на систематизації, порівняльному аналізі та теоретичному узагальненні факторів, що впливають на якість і вдосконалення ІТ-продуктів. У дослідженні ці фактори систематизовано у п'ять взаємопов'язаних груп: технічні, маркетингові, економічні, правові та регуляторні, а також соціально-психологічні. Результати показують, що технічні фактори визначають надійність, продуктивність і масштабованість; маркетингові фактори формують позиціонування та відповідність потребам клієнтів; економічні фактори визначають фінансову стійкість і розподіл ресурсів; правові та регуляторні фактори визначають вимоги до відповідності нормативним вимогам і зміцнюють довіру користувачів; соціально-психологічні фактори впливають на сприйняття, залученість, задоволеність і лояльність клієнтів. Запропонована матриця показує, що одна група факторів може впливати на результати з різною інтенсивністю, що допомагає продуктовим менеджерам визначати пріоритети. Дослідження ілюструє практичне застосування матриці на прикладі Weblium, українського конструктора сайтів, де аналіз факторів дав змогу обґрунтувати рішення щодо підвищення видимості статусу індексації сайту в інтерфейсі. Практична цінність полягає в наданні фреймворку для оцінювання ініціатив із вдосконалення та поєднання продуктових рішень із користувацьким досвідом, економічною віддачею та масштабованістю. Подальші дослідження можуть бути спрямовані на вивчення цього фреймворку в різних контекстах продуктового менеджменту та оцінювання того, як значущість кожного фактора змінюється на різних етапах життєвого циклу ІТ-продукту.*

Ключові слова: управління продуктами, ІТ-продукт, цифровий розвиток, відповідність нормативним вимогам, цифрова поведінка клієнтів, користувацький досвід.

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Abstract. *The relevance of the study stems from the growing complexity of digital markets, rapid technological change, regulatory pressure, and rising user expectations regarding the quality and convenience of IT products. Under these conditions, product management cannot rely only on technical improvement or market analysis, because product quality results from the coordinated influence of several factor groups. The aim of this study is to systematically identify and evaluate key factors that shape the quality and improvement of IT products in product management. The object of the study is the process of IT product quality formation and improvement within product management. The methodological foundation of the study is based on the systematization, comparative analysis, and theoretical generalization of the factors influencing IT product quality and improvement. The study systematizes these factors into five interconnected groups: technical, marketing, economic, legal and regulatory, and socio-psychological. The results show that technical factors determine reliability, performance, and scalability; marketing factors shape positioning and customer alignment; economic factors define financial sustainability and resource allocation; legal and regulatory factors set compliance*

requirements and trust; socio-psychological factors affect perception, engagement, satisfaction, and loyalty. The proposed matrix shows that one factor group may influence outcomes with different intensity, which helps product managers select priorities. The study illustrates the practical application of the matrix through the case of Weblium, a Ukrainian website builder, where factor analysis supported a product management decision to improve the visibility of website indexing status. The practical value lies in providing a framework for evaluating improvement initiatives and connecting product decisions with user experience, economic return, and scalability. Further research may examine the framework in different product management contexts and assess how the importance of each factor changes across the IT product lifecycle.

Keywords: product management, IT product, digital development, regulatory compliance, digital customer behavior, user experience.

Formulas: 0; fig.: 0; tab.: 3; bibl.: 13

Introduction. In the light of digital transformation, effective product management has become a key factor in ensuring the competitiveness of companies in the IT industry. The growing dynamics of the digital services and the software markets, increased user expectations, and the rapid development of technologies necessitate the continuous improvement of IT products. Product management, which combines strategic planning and flexible response to change, is vital to this process.

Recent studies and publications examine various aspects of IT product development and product management, including technical architecture, user experience, market positioning, regulatory compliance, and economic sustainability. However, these factors are often considered separately, while the issue of their systematic identification and integrated assessment in relation to IT product quality and improvement remains insufficiently researched.

This creates an important scientific and practical task of determining how different groups of factors influence the development and advancement of IT products within product management. Such research is especially relevant under current conditions of growing demand for customer personalization, market volatility, information security concerns, and the need for efficient use of resources. Identifying these factors helps form mechanisms for optimizing IT products, prioritizing development initiatives, and increasing competitiveness in the digital market.

Literature review. Scientific research on factors that affect the quality and improvement of IT products in product management is mostly concentrated on individual aspects rather than an integrated framework.

Certain aspects of marketing and socio-psychological factors are considered in the article by Melegati et al. (2024), which analyzes the role of product management specialists. It highlights that product management performs a multidisciplinary role not only within product guidance and vision creation but is also interconnected with business, marketing, interface design, and user experience aspects.

Technical factors are addressed through architecture, automation, DevOps, and AI. Badampudi, Usman, and Chen (2025) show the role of CI/CD and microservice reuse in software development, while Wiedemann, Wiesche, Gewald, Krcmar (2023) analyze the integration of development and operations teams in the DevOps approach. Witkowski and Wodecki (2025) also highlight the growing role of artificial intelligence in new product development and product management processes.

Economic factors are addressed through SaaS monetization models, pricing strategies, and users' willingness to pay. Hsu, Yen, Hu, and Nguyen (2024) examine the conversion of free users into paying customers in freemium services, while Tyrväinen and Karjaluoto (2024) analyze willingness to pay under different freemium monetization strategies. These studies show that economic factors influence IT product improvement through business model selection, value perception, pricing logic, and financial sustainability.

In the article by Gnanasambandam, Harrysson, and Singh (2022), the authors

attempted to examine regulatory factors affecting product management. The research shows that regulatory aspects, such as adherence to the General Data Protection Regulation (GDPR), have become a part of the user experience and should be considered in product management. Also, the study shows that 80% of surveyed product managers use GDPR standards to measure the success of their products' privacy, which expands this aspect beyond strictly a legal requirement.

Thus, previous studies provide important insights into separate aspects of IT product management. However, the integrated assessment of these factors and their influence on product management outcomes remains insufficiently developed, which justifies the need for the present study.

Aim and methodology. The aim of this study is to develop an analytical framework for identifying, systematizing, and interpreting the factors that influence IT product improvement in product management.

To achieve this aim, the study addresses several intermediate tasks, including the identification and grouping of relevant factors, the assessment of their influence on selected product management outcomes, and the illustration of the proposed approach through a practical case of an IT product.

The study uses systematization, comparative analysis, and theoretical generalization to identify and structure the main factors affecting the quality and improvement of IT products within product management. The theoretical basis of the study includes product management and IT product improvement concepts, as well as the systems approach to analyzing interactions between different factor groups. Based on previous studies in information systems and management, the article groups the identified factors into five interrelated categories and interprets their influence through an analytical matrix. The proposed approach links factor identification with the assessment of product management outcomes and the formulation of managerial conclusions.

Results. IT product improvement is a complex process that encompasses a number of interrelated factors. Effective management of this process is based on the application of modern technological solutions, adaptation to shifts in the market, and the use of methods that ensure flexibility, scalability, and productivity of IT products. In its turn, product management combines market analysis, the study of user behavior, product life cycle management, decision-making regarding its technical development, and optimization of development processes, which indicates a multifactorial impact and plays a key role in the process of IT product improvement. As part of the study, the key factors that affect the quality and improvement of IT products were systematized and grouped into five main categories: technical, marketing, economic, legal, and socio-psychological. Each group is described below, based on the data collected during the study.

Technical factors, including architectural solutions, the use of cloud technologies, the level of automation, the implementation of artificial intelligence, and Big Data analytics, occupy an important place among the main factors of improving IT products (Akter, Michael, Uddin, McCarthy, Rahman, 2020). Worth noting that the choice of product architecture influences stability, scalability, and the ability to integrate with other systems. IT companies are increasingly using microservices architectures and Serverless Computing approaches, which makes it possible to effectively expand IT product functionality without reducing performance. Additionally, automation of testing and development, including the use of Continuous Integration/Continuous Delivery processes, reduces the time of a product's market entry and lowers the probability of errors during production that positively affects IT products' quality (Badampudi, Usman, Chen, 2025).

Simultaneously, the use of modern technologies in product management, such as machine learning and artificial intelligence, is an essential part of improving IT products, since it allows for automating business processes, building personalized advisory systems, and increasing the performance of

data analysis. Besides, blockchain technology makes it possible to make transactions more transparent and secure, which is especially important for IT products in the financial and e-commerce sectors (Witkowski, Wodecki, 2025).

Cloud technologies and a DevOps approach enable optimal resource management, dynamic scaling, and high availability of digital services. These factors allow companies to reduce operating costs, increase the efficiency of their products, and be flexible in relation to fluctuations in the market (Wiedemann, Wiesche, Gewald, Krcmar, 2023). As a result, considering technical factors, it is important to effectively use the latest technologies and optimize development processes. The technical factors are summarized in Table 1.

Table 1

Technical factors influencing the quality and improvement of IT products

Factors	Impact description	Expected effect
Architectural solutions	The choice of architecture affects stability, scalability, and integrations with other systems	Functionality can be extended without reducing performance
Level of automation	Automation of processes improves quality and reduces the possibility of errors and time to market	Reducing the risk of errors and accelerating time to market
Cloud technologies usage	Cloud technologies provide flexibility, scalability, and reduce operating costs	Flexible resource management and reducing costs
Artificial intelligence usage	AI assist with automating business processes, personalizing customer experiences, and data analysis	Optimization of business processes and improvement of customer interactions
Big Data analytics	Big Data helps effectively analyze large amounts of data, identify trends, and improve decision-making	Deeper data analysis and improved strategic planning
Development and testing automation (CI/CD)	CI/CD allows acceleration of the development, testing, and release cycle of software	Continuous integration and deployment of new software versions
Blockchain technology	Blockchain provides security of transactions and transparency, which is critical for the financial sector and e-commerce	Enhancing security and reliability of digital transactions
DevOps approach	DevOps ensures efficient usage of resources, dynamic scaling of infrastructure, and high uptime of digital services	The IT product's flexibility to market changes and increased product efficiency

Sources: systematized by the author based on Akter et al. (2020); Witkowski, & Wodecki (2025); Wiedemann et al. (2023); Badampudi, Usman, & Chen (2025)

Marketing factors, to a large extent, determine the effective development and improvement of IT products that affect the product competitiveness, its correspondence with market requirements, and the extent of user satisfaction. Marketing strategies for IT products in the modern environment are based on market analysis, optimization of product positioning, assessment of customer behavior, and creation of competitive advantages. Market research allows for assessing the prospects of product development and how possible that it will adapt to changing customer preferences and the competitive environment. Target market analysis is a significant stage of this process, which includes segmenting the audience by demographic and behavioral parameters. The Jobs-to-be-Done (JTBD) approach assists product managers in identifying the main needs and motives of customers, which contributes to the production of high-quality customer-oriented solutions (Kalbach, Wermuth, Duda, Ciontu, 2024).

Also, the improvement of IT products depends on interpreting user behavior. By using user data analytics, such as User Behavior Analytics (UBA), it is possible to evaluate the effectiveness of the product functionality and identify elements that require improvement. Engagement metrics such as

Retention Rate, Churn Rate, and Net Promoter Score (NPS) help determine how well users are engaging with the IT product and how marketing strategies are impacting their behavior (Baehre, O'Dwyer, O'Malley, Story, 2022).

Economic factors considerably influence the quality and improvement possibilities of IT products, since they determine the financial capabilities of the development, the resource assignment efficiency, and the lasting profitability of an IT product. The cost of development, supporting, and scaling an IT product highly depends on the applied business models and monetization strategies.

In practice, transactional models, subscription models, the Pay-Per-Use approach, as well as free basic versions with paid extensions (Freemium) are widely used in the IT sphere. The choice of these strategies or their combination allows you to adapt to the solvency of the target audience, stimulate the growth of the customer base, and provide a stable cash flow. Dynamic pricing also helps increase business flexibility in conditions of changing demand (Tyrväinen, Karjaluoto, 2024; Hsu et al. 2025).

Thus, a well-prepared economic strategy, which includes monetization models, cost control, and forecasting of financial risks, is an essential factor in the successful development and improvement of IT products in high competitive and constantly changing market.

Legal and regulatory factors have a significant impact on the development and improvement of IT products, since they define the legal framework for operation, set cybersecurity standards, and establish requirements for data collection, processing, and storage (OECD/KDI, 2021). Besides, in the modern IT industry, conformity to legal requirements not only provides risk mitigation but also is a criterion of product quality, since these requirements are aspects of product reliability, accessibility, end-user trust, and market acceptability. Hence, reducing legal risks and sustaining user trust requires compliance with regulatory requirements in the IT sector. Companies developing IT products should take into account regional and international standards that regulate the digital industry.

As digital services increasingly work with large volumes of confidential data, compliance with personal data protection standards is an essential part of the regulation of IT products. The General Data Protection Regulation (GDPR) establishes strict requirements for data processing transparency in the European Union and sets the responsibility of companies to ensure the user information security. In the United States, the California Consumer Privacy Act (CCPA), along with other regulations, gives consumers the right to control their data. In addition, international cybersecurity standards, such as ISO/IEC 27001 and SOC 2, regulate information security, infrastructure security for digital products, and risk management. Technology companies, primarily when operating in the EU and the US, must comply with the abovementioned regulations, and this requires corresponding changes on the technical site and in internal policies of IT products (Seun, Adekunle, Chidiogo, Nkechi, 2024).

Socio-psychological factors serve an essential role in the process of improving IT products, as they determine the level of user engagement, customers' emotional response to the product, as well as the convenience and effectiveness of using the IT product. Thoughtful User experience (UX) and User interface (UI) designs, the use of behavioral economics principles, the creation of an emotional connection with the user, and the inclusion of gamification mechanics increase the probability that the product will meet the expectations of users (Taborda, 2024). Taking these items into account contributes to advancing user satisfaction, customer retention, and the formation of long-term brand loyalty. UI/UX design shapes the overall experience of user interaction with the product and is an essential part of the socio-psychological impact. The effectiveness of UX/UI is based on factors such as ease of use, predictability of interface actions, and

adaptation to the audience's understanding (Balasm et al., 2025). Customer retention and satisfaction can be increased due to personalized interfaces, lower cognitive load, and distinct user capabilities.

Also, user behavioral patterns influence the decision-making process and determine the way they interact with IT products. Digital services can be improved using psychological aspects such as the first impression effect, the anchoring effect, and loss aversion mechanisms.

Thus, socio-psychological factors directly influence the effectiveness of IT products, increasing their acceptability to users. Considering behavioral factors, using gamification mechanics, and making UX/UI design that meets the cognitive characteristics of the audience enlarges engagement, improves user experience, and increases the competitiveness of digital services. The key factors influencing the improvement of IT products are summarized in Table 2.

Table 2

Key factors influencing the quality and improvement of IT products

Factors	Description	Key technologies and methods	Impact on the competitive field
Technical factors	Cover architectural solutions, automation level, cloud technologies, AI, Big Data. Implementing microservice architectures increases scalability and stability. Automation through CI/CD reduces time to market.	Microservices, serverless architectures, CI/CD, AI, Big Data, cloud computing, DevOps	Increase the performance, scalability, security, and stability of IT products.
Marketing factors	Focused on market analysis, consumer behavior, product positioning. It helps determine UVP and the level of competition by using the JTBD concept, SWOT analysis, and Porter's model.	JTBD, SWOT analysis, Porter analysis, User Behavior Analytics (UBA), heat maps, cohort analysis	Help with adapting the product to market changes, improve positioning and competitive advantages.
Economic factors	Determine financial sustainability, development costs, and monetization strategies, as well as cost optimization through DevOps and cloud services.	Subscription models, transactional models, Pay-Per-Use, Freemium, cloud services	Ensure financial stability, reduces costs, and increases profitability.
Legal and regulatory factors	Include personal data protection regulations (GDPR, CCPA), international cybersecurity standards (ISO/IEC 27001, SOC 2), Digital Services Act, software patenting, Open Source licensing (GNU GPL, MIT, Apache).	GDPR, CCPA, ISO/IEC 27001, SOC 2, Digital Services Act, patenting, OSS licenses	Minimize legal risks, ensures user trust, and allows access to international markets.
Socio-psychological factors	Cover UX/UI design, behavioral patterns, gamification, emotional design. Uses A/B testing, NPS, heat map analysis to evaluate the effectiveness of UX/UI and behavioral strategies.	UX/UI design, behavioral economics, A/B testing, gamification, emotional design	Provide better user interaction, increases engagement and satisfaction.

Source: systematized by the author

These groups of factors are interconnected and form a system in which each group affects the effectiveness of others that should be considered during product management decision-making.

As an example, technical factors influence marketing decisions, for instance, when entering a new market, since server location and IT product functionality need to meet new market requirements. In turn, technical decisions are often made according to marketing research to improve product-market fit.

Marketing factors, based on market analysis and behavior research, outline the product’s value proposition, while socio-psychological aspects, such as UX/UI design, should be grounded on the insights about the

customers that the marketing team obtained during research.

Economic factors, including the monetization model, also interrelate with marketing strategy and IT product positioning. The ability to implement technical decisions and the development speed are connected to economic factors, since they require financial resources.

Regulatory compliance connects with marketing by forming trust of customers. It influences the technical implementation of IT products, for example, to comply with GDPR, CCPA, and accessibility requirements. Simultaneously, it decreases the risk of financial penalties and sets restrictions that may limit prohibited advertising methods in marketing.

To move from a descriptive classification to an analytical interpretation, the identified factor groups should be assessed through their influence on product management outcomes. For this purpose, three outcome dimensions are used: user experience, return on investment (ROI), and scalability. User experience reflects the perceived value and convenience of the product for customers; ROI reflects the economic effect of product decisions; scalability reflects the ability of the product and organization to grow without a proportional increase in costs and managerial complexity. The proposed in Table 3 analytical matrix provides a tool to compare the influence of each factor group across these dimensions and to use the results for prioritizing improvement initiatives.

Table 3

Analytical matrix of the influence of factors on IT product quality and improvement in product management

Factor group	Impact on user experience	Impact on ROI	Impact on scalability
Technical factors	High – system stability, speed, security, integrations, and automation directly shape the quality of interaction with the product.	High – architecture, cloud services, CI/CD, and automation reduce development costs, support costs, and time to market.	High – microservices, cloud infrastructure, DevOps, and automation directly determine the ability to expand functionality and capacity.
Marketing factors	High – segmentation, JTBD analysis, positioning, and user behavior analytics align the product with customer needs and expectations.	High – better positioning, acquisition, conversion, retention, and pricing fit increase the economic return of product decisions.	Medium – market research supports expansion, localization, and prioritization, but scaling also depends on technical and economic readiness.
Economic factors	Medium – budget allocation affects feature quality, pricing accessibility, support, and service continuity, but the effect on UX is often indirect.	High – monetization model, cost control, and unit economics directly determine profitability and the payback of product improvements.	High – financial resources define the ability to scale infrastructure, teams, support processes, and product development.
Legal and regulatory factors	Medium – privacy, security, accessibility, and transparent data use increase trust, although poorly designed compliance may add friction.	Medium – compliance reduces legal risks and penalties, enables access to regulated markets, and strengthens customer trust; however, its impact on ROI is mainly protective and indirect	High – legal requirements define conditions for geographic and sectoral expansion and require continuous adaptation of the product.
Socio-psychological factors	High – UX/UI design, cognitive load reduction, emotional design, and gamification directly affect satisfaction, engagement, and loyalty.	Medium – higher engagement, retention, and brand loyalty improve conversion and customer lifetime value, although the effect is partly mediated by user behavior.	Medium – effective onboarding and self-service patterns support user-base growth, but infrastructure and organizational scaling remain separate requirements.

Source: developed by the author

The practical application of the proposed matrix can be illustrated by a Ukrainian website builder Weblium, which enables users to create and manage websites without coding. In Weblium's product management practice, one of the identified problems was that users did not always understand why their websites were not visible in search engines when the indexing option was disabled in the product settings. According to the proposed matrix, this case primarily concerns the impact of socio-psychological, marketing, and technical factors on user experience, with an indirect effect on ROI.

From the socio-psychological perspective, unclear indexing status increased cognitive load and uncertainty, which negatively affected user confidence in the product. From the marketing perspective, search engine visibility was connected with the perceived value of the website builder, because users expected the created website to be discoverable online. From the technical perspective, the indexing setting already existed, but its state was not sufficiently visible in the main website management flow. Therefore, the managerial decision was to make the indexing status visible on the website management interface and connect it with a clear corrective action. This decision was aimed primarily at improving UX by reducing uncertainty and support-related friction, while its indirect ROI effect was expected through higher user trust, fewer support requests, and better activation of users who rely on website visibility.

Conclusions. The findings reveal that quality and improvement outcomes of IT products through product management are determined by the coordinated interaction of technical, marketing, economic, legal and regulatory, and socio-psychological factors. Technical factors determine reliability and scalability, while marketing factors shape positioning and market fit. Economic factors influence financial sustainability; legal and regulatory mechanisms determine compliance obligations; and socio-psychological factors affect customer perception of the IT product.

The scientific novelty of the study lies in the transition from a descriptive classification of factors to their analytical interpretation through the proposed matrix of factor influence on IT product quality and improvement. This matrix links each factor group with three product management outcomes: user experience, ROI, and scalability. Its application to the Weblium case demonstrates how factor analysis can support managerial decision-making.

The theoretical significance of the study is that it develops an integrated view of IT product improvement within product management by connecting different groups of factors with selected managerial outcomes. The practical significance of the study is that it provides a conceptual framework for evaluating and identifying factors to consider within product management when developing IT products. The suggested framework may help product managers in determining directions of quality improvements and further IT product development prioritization.

The socio-economic effect of applying the proposed approach may be reflected in higher competitiveness of IT products, improved user satisfaction, reduced support costs, better compliance with market and regulatory requirements, and more sustainable product growth.

Further research may be aimed at the examination of the proposed framework application within different product management contexts and the variation of the relative importance of each factor over different stages of the IT product lifecycle.

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