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SYNERGISM OF QUALITY MANAGEMENT AND MARKETING IN ENSURING STARTUP COMPETITIVENESS

СИНЕРГІЗМ УПРАВЛІННЯ ЯКІСТЮ ТА МАРКЕТИНГУ В ПРОЦЕСІ ЗАБЕЗПЕЧЕННЯ КОНКУРЕНТОСПРОМОЖНОСТІ СТАРТАПУ

Summary. The article explores the synergy between marketing and quality management as a driver of startup competitiveness under conditions of high market turbulence, rapid technological change, and resource constraints. It demonstrates that the traditional separation of these functions leads to fragmented business processes, slower responsiveness, and reduced investment efficiency. The study aims to develop a conceptual and methodological model of marketing–quality management synergy in startups, grounded in integrated KPIs and visualization tools. The findings show that the integrative model significantly outperforms the traditional approach across key criteria. The proposed KPI system and Synergy Index provide a quantitative measure of marketing–quality integration, while the heatmap visualisation enables the rapid identification of areas of maximum and minimum synergy, thereby enhancing the model's practical value.

Keywords: quality management, synergy, marketing, startup, competitiveness, integration model, synergy KPI Index.

Анотація. Ключова ідея дослідження полягає в обґрунтуванні інтеграційної рамки взаємодії маркетингу та управління якістю у стартапах і розробленні системи показників ефективності та індексу синергії (IS), який поєднує маркетингові та якісні KPI в єдиній інтеграційній системі оцінювання ефективності. У статті досліджено синергію маркетингу та управління якістю як чинник формування конкурентоспроможності стартапів в умовах високої ринкової турбулентності. Доведено, що розмежування цих функцій спричиняє фрагментацію бізнес-процесів, втрату швидкості реагування та зниження ефективності використання інвестицій. Огляд наукової літератури засвідчив недостатню увагу до інтеграційних підходів у маркетингу та управлінні якістю стартапів, а також відсутність кількісних інструментів для оцінки їх синергії. Метою дослідження є розроблення концептуально-методологічної моделі синергії маркетингу та управління якістю стартапів, що ґрунтується на інтегрованих KPI. Для її реалізації використано комбінований підхід, який поєднує аналітичний огляд, порівняльний аналіз традиційної та інтеграційної моделей, розроблення системи KPI та побудову теплової мапи для оцінки інтеграції бізнес-процесів. Результати дослідження свідчать, що інтеграційна модель має суттєві переваги за ключовими критеріями – швидкістю зворотного зв'язку,

ефективністю використання ресурсів, гнучкістю, масштабованістю та стійкістю конкурентної переваги – порівняно з традиційним підходом. Запропонована система KPI та індекс синергії дають змогу кількісно вимірювати інтеграцію маркетингу та управління якістю, а теплова карта дозволяє оперативно ідентифікувати зони максимальної та мінімальної синергії, підвищуючи прикладну цінність моделі. Перспективи подальших досліджень передбачають емпіричну перевірку індексу синергії на реальних вибірках стартапів, інтеграцію додаткових параметрів – фінансової стійкості, інноваційної активності, управлінської спроможності – у систему KPI, а також розроблення програмного інструментарію для моніторингу показників інтеграції у реальному часі.

Ключові слова: управління якістю, синергія, маркетинг, стартап, конкурентоспроможність, інтеграційна модель, індекс синергії KPI.

Problem statement. Modern startups operate in environments characterized by high turbulence, rapid technological change, and limited resources. Under such conditions, the traditional separation of marketing and quality management results in fragmented business processes, slower responsiveness, and reduced efficiency in the use of investment capital. By contrast, integrating these functions creates a synergistic effect that supports more sustainable growth, accelerates product improvement, and strengthens customer loyalty.

The relevance of this problem stems from the fact that most scholarly research on marketing and quality management in startups is conducted separately, without considering the interactions between these two domains. In practice—particularly under conditions of time and financial constraints—startups require unified models that allow them to manage product development and market promotion simultaneously, using integrated performance indicators.

The core problem lies in the absence of a scientifically substantiated integrative framework and quantitative tools that could measure the effectiveness of marketing–quality synergy at different stages of a startup's development. This gap creates a misalignment between theoretical advances and real-world managerial practices.

Solving this problem is crucial for both science and practice. The scientific task is to develop a conceptual and methodological model of marketing–quality synergy based on integrated KPIs and visualization tools. The practical task is to provide startups, investors, and business incubators with instruments to assess the integration of their business processes, optimize resource allocation, and forecast competitiveness.

Analysis of recent research and publications. In current conditions, researchers are increasingly focusing on ensuring the competitiveness of startups, especially through the integration of marketing and quality management. Such studies are primarily due to the growing role of digital marketing, the digitalization of business processes, and the need for innovative management tools [2; 3]. It is worth noting that Ukrainian and international scholars have also paid attention to improving marketing activity and introducing innovative marketing tools for startup development in the digital age [5; 6; 7].

In the context of strategic and security-oriented management of enterprises, Franchuk V., Pryhunov P., Melnyk S. and others emphasized the theoretical and methodological principles of the security environment and crisis management [1; 12; 14]. These studies create a methodological background for integrating marketing and quality management under conditions of high risk and limited resources typical of startups.

Theoretical and applied principles of modern marketing concepts and marketing management have been actively analyzed by domestic researchers, including Voychak A.V., Holiash I., and Zhuk O.I., who examined the effectiveness of marketing activities and tools [4; 8; 9]. Competitive advantages as the basis of a successful organizational development strategy were highlighted in the works of Kyrych N.B., Shveda N.M., and Yuryk N. Ye. [10]. Furthermore, Lukyan O.M., Piskun D.N., and Shpak N.O. studied the economic essence of marketing activities and approaches to evaluating the effectiveness of marketing tools at enterprises [11; 13; 15].

Overall, the conducted literature analysis demonstrates a growing scientific interest in the synergy of marketing and quality management as a means of forming sustainable competitive advantages for startups. At the same time, there is a lack of research that comprehensively combines the concept of integrated marketing–quality management with quantitative performance indicators, which determines the relevance of the present study.

Highlighting previously unresolved problems. An analysis of academic publications and practical cases shows that marketing and quality management in startups are typically studied in isolation. Most research focuses either on product promotion and customer acquisition or on quality assurance and process standardization, leaving their synergistic interaction largely unexplored. This fragmentation has prevented the formation of a unified scientific view on integrated startup management.

Another unresolved issue is the absence of quantitative tools to assess the synergy between marketing and quality management. Although separate KPIs exist in both domains (e.g., CAC, LTV, Retention, Defect Rate, SLA), no composite index measures their joint effectiveness throughout a startup's growth stages.

Likewise, the lack of an integrative framework reflecting the startup life cycle – from MVP to scaling and maturity – forces firms to rely on fragmented approaches that reduce adaptability and investment efficiency. The resulting gap between theoretical developments and practical management underlines the core scientific problem addressed in this study.

The purpose of this article is to develop and substantiate an integrative framework for the interaction between marketing and quality management in startups, followed by the creation of a performance measurement system and a Synergy Index, as well as their visualization in the form of a matrix map. This approach enables a comprehensive assessment of competitiveness at various stages of startup development.

To achieve this purpose, the article addresses the following objectives:

– analytically substantiate the need for integrating marketing and quality management in startups;

– systematize the stages of startup development and identify shifts in the priorities between marketing and quality at each stage;

– develop an integrative model of marketing–quality interaction (an integrative framework);

– establish a KPI system and a Synergy Index to quantitatively evaluate the effectiveness of this interaction;

– construct a synergy heatmap and provide an analytical interpretation of its results.

Thus, the article combines theoretical–methodological and applied dimensions – from the concept of integration to the practical visualization of results – which underpins both its scientific novelty and practical significance.

Summary of the main research material. In today's environment, startups operate under conditions of high uncertainty and intense competition. The traditional approach, in which marketing and quality management are treated as separate functions, is losing its effectiveness. Current realities necessitate a synergistic approach that integrates two subsystems – the communication (marketing) and the operational–product (quality) – into a unified system for building competitive advantages [4; 6, 7, 9, 13].

The uniqueness of this approach lies in the fact that marketing is viewed not only as a product promotion channel but also as a source of data for improving quality, while quality becomes the foundation of the communication message. The dynamic development of a startup dictates a continuous shift in its priorities [3, 4, 10]:

• at the MVP stage – rapid market testing is crucial;

• during the scaling phase – process standardization and brand building become priorities;

• at the maturity stage – customer retention and product stability gain importance.

Implementing an integrated approach that flexibly adjusts the balance between marketing and quality management depending on the stage of development makes it possible to:

• ensure alignment between communications and product improvement;

• optimize resource allocation and enhance investment efficiency;

• build sustainable competitive advantages through the simultaneous growth of loyalty and quality.

In traditional business practice, marketing and quality management are treated as isolated functions that interact only through formal reporting. This "siloed" approach is typical of established enterprises with well-developed business models, where time and resources allow for a sequential cycle of "product development – marketing – quality control." For startups, however, it proves far less effective due to the need for rapid feedback, flexible management, and integrated decision-making.

Key features of the traditional model [2, 4]:

• functional separation: Marketing and quality management exist as independent units, with market data being integrated only belatedly;

• sequential logic: A product is first created and then promoted by marketing; quality is responsible solely for the technical aspect;

• lack of shared KPIs: Marketing is evaluated by CAC, LTV, and conversion, while quality is assessed by Defect Rate, SLA, and certification;

• reactivity: Quality improvements occur post factum, and marketing does not directly influence quality processes.

The integrative model proposed in this article combines the communication and operational–product subsystems into a single system for building competitive advantages. Marketing tools become a source of data for product improvement, while quality serves as the foundation of the communication message. This ensures alignment between communications and product development, optimizes resource allocation, and builds sustainable competitive advantages (Table 1).

For a scientifically grounded comparison of these approaches, criteria relevant to startups have been established [3]:

• speed of feedback from the market;

• alignment between communications and product improvement;

• efficiency of resource utilization;

• level of Retention/NPS;

• flexibility and scalability;

• sustainability of competitive advantages.

The following table demonstrates the conceptual differences between the models. Table 2 presents a comparative description of the traditional and integrated marketing–quality models in startups.

Table 1 – Qualitative characteristics of traditional and integration models of marketing–quality in startups

Criterion	Traditional Model	Integration model
functional logic	Sequential: Product → Marketing	Parallel: marketing + quality = synergy
Customer data	Only considered for marketing decisions	Also used to improve product quality
KPI	Separated (CAC vs Defect Rate)	Common synergy index KPI
Speed of feedback	Low (long cycle)	High (quick testing and changes)
Competitive advantage	Short-term, unstable	Long-term, sustainable

Source: developed by authors

Table 2 – Comparative characteristics of the traditional and integration model of marketing–quality in startups

Criterion	Traditional Model	Integration model	Comment
Speed of feedback from the market	2	5	In the traditional model, the cycle is long; in the integrated one, instant updates
Efficiency of resource use	3	5	Avoids duplication of functions; joint budget planning
Retention Rate/NPS	2	4	In the integrated model, the product adapts to needs faster
Flexibility and scalability	2	5	Integration allows for faster scaling of business processes
Sustainability of competitive advantage	2	5	Integration creates long-term advantage, not just short-term hype
	11	24	

Source: developed by authors

Interpretation of scores: 1 – very low level; 2 – low; 3 – medium; 4 – high; 5 – very high.

To quantitatively assess the effectiveness of the integration model, a KPI system was formed, covering three blocks:

- product quality: Defect Rate / SLA Compliance.
- marketing effectiveness: CAC, LTV.
- customer loyalty: Retention Rate, NPS, Churn Rate.

This combination allows you to see not only the state of individual functions, but also the effect of their integration. Derived indicators are offered to measure integration:

RR × (1 – Defect Rate) – the impact of reducing defects on customer retention;

NPS / Churn Rate – loyalty-to-churn ratio;

LTV / CAC – how much quality the customer retains, increasing their value.

To reflect the integrated effect, a "synergy index" can be created (IS):

$$IS = \frac{(RR + NPSnorm) \times (LTV / CAC)}{DeFectRate + ChernRate}$$

where:

RR – the proportion of users who remain after a certain period;

NPS_{norm} – normalized value NPS;

LTV/CAC – efficiency ratio;

DefectRate + ChurnRate – total losses.

IS > 1 – high synergy;

IS ≈ 1 – neutral;

IS < 1 – imbalance.

The next step is to transform the analytical model into a visual form. This makes it possible to identify patterns, compare results across the stages of startup development, and make the model understandable for practical application.

To visualize the level of synergy, a heatmap with color gradation is proposed: red indicates low synergy, while green represents high synergy. This enables the rapid identification of areas with maximum and minimum synergy (Table 3).

Table 3 – Visual representation of the synergy index (IS) as a heatmap

	Low marketing	High marketing
Low quality	Low competitiveness (IS < 1)	Initial boom, but weak sustaining effect (IS ≈ 0,7)
High quality	Strong product, weak reach (IS ≈ 1)	Perfect synergy, high loyalty (IS > 2)

Source: developed by authors

Legend:
– red – IS < 1
– orange – IS 0.7–1.0
– yellow – IS ≈ 1.0–1.5
– green – IS > 1.5.

Using a heatmap will make it possible to quickly identify areas of maximum and minimum synergy, thereby enhancing the practical value of the proposed model.

Conclusions. The conducted study has demonstrated that the traditional separation of marketing and quality management functions in startups under conditions of high uncertainty is ineffective. The proposed integrative model, which combines communication and operational–product subsystems, ensures:

• faster and higher-quality feedback from the market;

• alignment between communications and product improvement;

• optimization of resource utilization and the formation of long-term competitive advantages.

The qualitative and quantitative comparative analysis confirmed the superiority of the integrative model across key criteria – feedback speed, Retention/NPS, flexibility and scalability, and the sustainability of competitive advantage. The proposed KPI system, grouped into three blocks (product quality, marketing effectiveness, and customer loyalty), together with the Synergy Index (SI), enables the quantitative measurement of marketing–quality integration. The heatmap visualization clearly highlights areas where synergy is either maximized or insufficient, thereby enhancing the applied value of the model.

Thus, the results of the study confirm both the scientific and practical relevance of an integrated approach to startup management. Future research will enable the transformation of the marketing–quality synergy model into an applied toolkit for strengthening the competitiveness of innovative companies.

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