



The Continuity of Management Marketing and Lean Production in the Era of Industry 5.0

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Abstract

The emergence of Industry 5.0 brings to the forefront new approaches to the organization of managerial and marketing processes that focus not only on efficiency but also on process optimization and the creation of maximum added value for society and individuals through the development of sustainable business models. Such models are capable of ensuring enterprise flexibility in a dynamic environment, integrating digital technologies with a focus on individual customer needs, and achieving strategic competitiveness. While the previous stage of industrial development - Industry 4.0 - emphasized digitalization, automation, and the integration of cyber-physical systems, the current stage is characterized by a strengthened human-centric orientation, the synergy of innovative technologies, and the promotion of humanistic values. Under these conditions, there arises a need to develop conceptual models that ensure the continuity of the development of managerial and marketing systems and their harmonious integration with the principles of lean production. Thus, the study of the continuity of management marketing in the context of lean production principles within Industry 5.0 represents an important scientific task that enables not only the identification of new opportunities for enterprises but also the determination of economic development prospects, where innovation, sustainability, and human centrality become key priorities.

Keywords: continuity, continuous-lean concept, marketing, management, Industry 5.0, lean production, sustainable development, competitiveness, synergy, systematicity, model, synergy, hybrid cognitive management systems, self-renewing business model.

1. Introduction

The continuous model of management marketing is based on the idea of continuity as a key principle in the development of managerial and marketing systems. The term *continuum* reflects the dynamic interconnection of all stages and elements of management, production, and marketing, which do not exist in isolation but instead form a unified evolutionary space.

Many scholars from different countries have explored issues of management, marketing, and lean production within the context of Industry 5.0, as reflected in several publications on the topic (**Chaikovska & Shkeda, 2023**; Deinega & Deinega 2021; Nechyporuk & Kocherhina, 2024; Rudan & Pidhaets, 2024; Ryvak 2022; Verkohliadova, 2023; Verkohliadova et al., 2024 and other authors). However, none have yet examined hybrid models that integrate all these components, nor have they analyzed the internal processes occurring within such models. Furthermore, there have been no studies addressing hybridization as a mechanism that enables the integration of managers' intuitive and value-based decisions with formalized analytical algorithms - an approach that enhances the accuracy, speed, and quality of managerial decision-making. A hybrid self-learning enterprise management system represents a new type of managerial architecture in which the organization functions as a living, intelligent organism endowed with the abilities of learning, self-regulation, and evolutionary development.

The modern conditions of economic development, digitalization, and the transition to Industry 5.0 necessitate a revision of traditional approaches to management and marketing. There is a growing need to

form continuous management systems in which marketing, management, and production processes are integrated into a single value creation flow. In this context, the integration of the lean approach (lean production) with modern digital and relational marketing mechanisms creates opportunities for the development of a new type of model - the continuous-lean model.

In management, this is manifested in the transition from linear process control to a system of continuous improvement. In marketing, it is reflected in the evolution from transactional interaction to continuous customer relationships (relationship and lifecycle marketing). Thus, continuity implies the elimination of gaps between the stages of management, marketing, and production, the integration of all enterprise functions into a unified value stream system, and mutual learning and adaptation based on feedback mechanisms.

In management, continuity is manifested through the cyclicity of managerial actions, where planning, implementation, control, and improvement form a closed and self-renewing process. In marketing, this principle is realized through the transition from transactional logic (focused on individual sales) to relational and continuous logic, which entails ongoing interaction with the consumer, the creation of long-term value, and the development of relationships based on trust and knowledge exchange. Continuity thus unites two key dimensions - the managerial (organizational) and the marketing (market-oriented) - into a single evolutionary system that ensures the enterprise's sustainability and adaptability within a dynamic digital environment.

The purpose of this study is to provide a theoretical and methodological foundation and to develop conceptual approaches to ensuring the continuity of management marketing based on the principles of lean production in the context of Industry 5.0. It also aims to identify strategic guidelines that enable the integration of digital technologies, resource efficiency, and human-centric managerial processes for the sustainable development of enterprises. To achieve this goal, the following objectives must be addressed: to substantiate the theoretical and methodological foundations of the synergy between the continuity of management marketing and lean approaches; to develop a model for integrating management marketing and the principles of lean production, oriented toward human centrality and sustainable development; to formulate practical recommendations for applying the obtained results within enterprise strategic management systems under the conditions of Industry 5.0.

The methodological basis of the study is a systemic and continuous approach to the study of management and marketing processes and the principles of lean production, as well as methods of comparative and structural-functional analysis, and content analysis of scientific sources.

The expected results of the study include the development of recommendations for the development of flexible management strategies for enterprises in the era of Industry 5.0 and the substantiation of new models for creating value for customers, taking into account digital transformations.

2. The Continuously Lean Concept of Management Marketing (CLMM) in the Era of Industry 5.0

The research is aimed at developing an integrated scientific concept that combines modern managerial and marketing instruments with lean approaches, thereby ensuring the sustainable development of enterprises in the context of global challenges and the opportunities of Industry 5.0. The outcome is the formulation of scientifically grounded recommendations for the design of flexible management strategies that enhance enterprise competitiveness under dynamic contemporary conditions.

The evolution of managerial and marketing concepts represents the gradual development of theoretical and practical approaches to management and marketing, reflecting changes in socio-economic conditions, technologies, and the value orientations of business. In the early stages (the beginning of the 20th century), management and marketing existed separately: management was based on the principles of F. Taylor's scientific management and A. Fayol's administrative school, both focused on efficiency and process rationalisation, whereas marketing emerged as a tool for sales and product promotion. In the mid-



20th century, significant shifts occurred - a consumer-oriented perspective emerged (F. Kotler, P. Drucker), and marketing gradually evolved into a philosophy of business rather than merely a functional activity. During this period, management developed towards human-centred theories (the human relations school, the behavioural approach), strengthening its interconnection with marketing, as both disciplines began to view the organisation through the prism of human needs - those of the customer and the employee alike. The late 20th and early 21st centuries are characterised by the strengthening of systemic and strategic approaches: management and marketing became integrated within the frameworks of strategic management, total quality management (TQM), and relationship marketing. A growing understanding emerged that the sustainable development of an enterprise requires the coherence of managerial and marketing decisions rather than their isolated functioning.

The contemporary stage (from Industry 4.0 to Industry 5.0) is characterised by a transition towards a digital, hybrid, and continuous model of management and marketing (Nechyporuk & Kocherhina, 2024). This stage is dominated by the principles of innovation, adaptability, value coordination, and human-centrism. Marketing is transforming into a system of relationship and data management (data-driven marketing), while management is evolving into a platform for the integration of technologies, knowledge, and human capital. In the context of digital transformation and global challenges, there arises a growing need for the synergy of managerial and marketing concepts with lean approaches that ensure continuous improvement, waste elimination, and the creation of sustainable value. Thus, modern evolution leads to the formation of a continuous managerial-marketing paradigm, in which the company is viewed as an open, self-developing system where management and marketing operate in unity to ensure flexibility, innovativeness, and sustainable development.

Continuity in management marketing implies the uninterrupted nature of processes - marketing and management are not confined to traditional cycles (analysis → planning → implementation → control) but represent a continuous process of development. It also encompasses the integration of functions, where managerial and marketing instruments interpenetrate, forming a unified system oriented towards customer value; adaptability, whereby changes in the external environment are instantly reflected in managerial and marketing decisions; and evolutionarity, where the organisation is viewed as a living organism that constantly learns, improves, and adapts (Sadchenko et al., 2024). Furthermore, human-centricity signifies that continuity is associated not only with technological but also with humanistic dimensions - the continuous consideration of the interests of both customers and employees.

Industry 5.0 represents a new stage in the evolution of economic systems, in which human-centricity, the integration of digital technologies, and a focus on sustainable development acquire paramount importance. In the context of ongoing transformations in the business environment, the search for effective management models that ensure the continuity of marketing and managerial processes, while harmoniously combining them with lean production principles, becomes particularly relevant. Such a synergetic approach minimises waste, enhances productivity, creates new value for customers, and strengthens the competitive position of enterprises in a dynamic market environment. Under these conditions, it is necessary to view not the individual components of the system, but rather a new system that unites all these elements. Continuity implies seamlessness - the absence of interruptions or segmentation into separate fragments (Ryvak, 2022; Sadchenko, 2025). The term is used to describe processes, phenomena, or smoothly evolving systems without abrupt shifts, whose essence lies in the unbroken connection between different elements or stages. The concept of continuity in management marketing and lean production reflects the integration of managerial and marketing approaches within a unified, self-developing system based on the principles of constancy, adaptability, and value-oriented interaction. In this context, continuity implies not a linear, but an evolutionary - cyclical development of managerial and marketing processes, where each stage of system improvement builds upon the outcomes of the previous one and forms the basis for further advancement.

Under the synergy of management marketing and lean production, continuity is manifested through the constant alignment of an enterprise's strategic objectives with the evolving needs of consumers, as well as through the optimisation of internal processes based on feedback, data, and customer value analysis.

Such a system functions as a dynamic environment in which marketing shapes value orientations and guides managerial decisions, while the principles of lean production ensure their effective implementation through waste elimination, standardisation, and continuous improvement.

The continuous approach is based on the idea that management and system development processes are continuous, interconnected, and dynamic phenomena that cannot be reduced to separate discrete stages. Its main idea is that management and marketing systems should be viewed as constantly evolving structures in which strategic, tactical and operational decisions form a single continuous chain of value creation. The essence of the continuous approach lies in:

continuity of development - management and marketing are not divided into closed cycles, but are integrated into a flow of continuous improvement,

integrity - all elements of the system (technology, resources, personnel, customers) are viewed as parts of a single process that are in constant interaction,

dynamism - the emphasis is on adaptability to changes in the environment and the system's ability to transform quickly,

synergy - the combination of management and marketing practices with the principles of innovation and lean manufacturing creates additional value.

Thus, the continuous approach is oriented towards ensuring the sustainability of development and the uninterrupted nature of managerial processes, which is particularly relevant in the context of Industry 5.0, where the key challenge lies in achieving a balance between digital technologies, resource efficiency, and human-centrism.

Let us consider the distinction between two approaches: the traditional and the continuous. The traditional (discrete) approach is more suitable for stable conditions, where processes are repeated according to predefined scenarios. In contrast, the continuous approach is flexible and highly relevant to the era of Industry 5.0, where dynamism, human-centricity, and constant adaptation to change are of paramount importance (Table 1).

Table 1. Comparison of continuous and traditional (discrete) approaches

Criterion	Traditional (discrete) approach	Continuous approach
Nature of processes	Considered as separate stages, completed cycles (plan → implementation → evaluation).	Viewed as a continuous flow, where each stage smoothly transitions into the next, or viewed as a single systemic approach, where all cycles occur simultaneously.
Management model	Sequential, linear, focused on fixed tasks.	Continuous, dynamic, focused on continuous improvement. The model is three-dimensional – spatial-temporal.
Focus of attention	Focused on solving a specific task at a specific point in time.	Based on systemic integrity and continuous process development.
Adaptability	Low: changes are implemented upon completion of the cycle or project.	High: changes are integrated in real time.
Connection between elements	Stages are relatively autonomous and can exist in isolation.	The elements are closely interrelated, with each process influencing the next.
Value creation	Value is generated after the cycle is completed.	Value is created continuously, at every stage of interaction.
Approach to innovation	Innovations are implemented periodically as a result of analysing completed cycles.	Innovations are integrated continuously as part of ongoing development.

The table was compiled by the author.



Thus, the analysis of the evolution of managerial and marketing concepts demonstrates that continuity is a natural outcome of the transition from discrete, cyclical models of management and marketing to an integrated, dynamic, and human-centric system characteristic of the Industry 5.0 era. The continuous model of management marketing and lean production represents a unified system in which the interaction of managerial, production, and marketing mechanisms is based on the idea of continuous development, self-learning, and the sustainable formation of both consumer and organisational value.

The concept of continuity in management, marketing, ecology, and Industry 5.0 reflects a shift from the fragmented management of individual enterprise functions towards an integrated, self-organising system grounded in the principles of interdependence, circularity, and sustainable development. Within this paradigm, each of these elements is viewed not as an autonomous subsystem but as part of a unified continuum of value creation.

Continuity in management is manifested in the system's ability to adapt, self-renew, and continuously improve managerial processes. Within this model, management is transformed from a function of control into a mechanism for maintaining balance between economic efficiency, innovativeness, and socio-environmental responsibility. Continuity in marketing is expressed through its transformation from a tool of sales and communication into a coordinator of value flows between the enterprise, the consumer, and the wider ecosystem. In the context of Industry 5.0, marketing evolves into a cognitive system of interconnections that integrates human needs, innovative solutions, and the principles of sustainable development.

Continuity in ecology implies a shift from reactive environmental management towards a proactive model in which ecological principles are integrated into corporate strategy, production processes, and organisational culture. The ecological continuum thus becomes a key driver of long-term competitiveness and innovative development.

Continuity in ecology reflects the evolution of managerial and strategic approaches from fragmented responses to environmental challenges towards systemic and integrated sustainable development management (Bieloborodova, 2020). It implies a shift from reactive environmental management, which primarily focuses on mitigating the consequences of negative environmental impacts, to a proactive model aimed at preventing ecological risks, minimising resource losses, and fostering ecosystem responsibility at all levels of organisational operations.

The proactive model of environmental management represents a modern strategic approach based on the principles of foresight, prevention, and the systematic integration of ecological considerations into enterprise management processes. Unlike the reactive model, where actions are predominantly directed at remedying the consequences of environmental violations, the proactive model emphasises anticipatory management of ecological risks and the cultivation of an environmentally sustainable organisational culture.

At its core, it is based on the principle of prevention, which involves not reacting to events that have already occurred, but analysing potential threats and opportunities at the early stages of decision-making. This requires a shift from an administrative-regulatory approach to a systemic-innovative paradigm, in which environmental objectives are integrated into the enterprise's development strategy, production processes, and marketing activities.

The key characteristics of the proactive model are:

- Integration of environmental criteria into strategic planning and investment decisions, ensuring the long-term sustainability of the enterprise.
- Application of ecological innovations and clean technologies, aimed at minimising environmental impact and optimising resource use.
- Development of a corporate environmental culture, focused on raising employee awareness and fostering ecological responsibility at all levels of management.
- Use of monitoring tools, ecological-economic assessments, and environmental audits, which

provide feedback and support the continuous improvement of processes.

- Formation of partnership ecosystems, involving engagement with stakeholders - including government bodies, local communities, consumers, and suppliers - to achieve a synergistic effect in sustainable development.

The proactive model of environmental management forms the foundation of continuous ecological governance, in which ecology is not treated as a separate function but as a continuous dimension of an enterprise's strategic development. Consequently, environmental policy becomes a source of competitive advantage, contributing to the growth of reputational capital, innovative activity, and the economic efficiency of the organisation.

Reputational capital is an intangible asset of the organisation, built on public trust, a positive image, ethical standards, and sustainable relationships with stakeholders. In contemporary conditions, it becomes a strategic resource that determines an enterprise's competitiveness as significantly as its material, financial, or innovative resources.

Within the context of proactive environmental management, reputational capital emerges as the outcome of systematic and consistent enterprise activity in the areas of environmental responsibility, sustainable development, and transparency of corporate practices. It reflects not only the external perception of the company but also its internal capacity to maintain a balance between economic efficiency and its socio-environmental mission.

The formation of reputational capital is based on several key principles, such as transparency and accountability, which involve informing the public and stakeholders about the enterprise's objectives, outcomes, and environmental impacts. It also relies on ethical leadership and a corporate culture that fosters values oriented towards environmental justice, human capital, and sustainable development. A critical aspect is social partnership, understood as the establishment of long-term, trust-based relationships with key stakeholders, including consumers, employees, investors, and local communities. Innovativeness and environmental efficiency are essential in the implementation of advanced technologies that reduce environmental impact, thereby enhancing public recognition and trust. Finally, a sustainable development communication strategy constitutes another principle, integrating ecological achievements and social responsibility within corporate communications, marketing, and branding systems.

Reputational capital performs a systemic function, linking the economic, social, and environmental outcomes of an enterprise's activities and transforming them into a symbol of trust and resilience. A well-developed reputational capital reduces reputational risks, ensures the loyalty of consumers and investors, facilitates the attraction of highly qualified professionals, and eases access to financial and innovative resources (Baliun, & Fiialka, 2018).

Within the context of the future Industry 5.0, reputational capital assumes a new significance - it becomes an indicator of an organisation's maturity and its capacity to operate within a continuous model, where environmental responsibility, digital transparency, and ethical interactions form the foundation of long-term sustainability.

Thus, reputational capital is not merely a social or image-related asset but a multi-layered system of trust and recognition, shaped at the intersection of environmental, managerial, and marketing strategies. Its accumulation and maintenance within the framework of proactive environmental management become one of the key factors in achieving strategic success and sustainable enterprise development.

Thus, the proactive model of environmental management represents an evolutionary stage in the development of environmentally oriented management systems, enabling enterprises to move from merely responding to external requirements towards the conscious creation of sustainable value for the economy, society, and the natural environment.

Within the proactive approach, environmental management transforms from an auxiliary function



into a strategic element of corporate governance, influencing managerial decision-making, innovation policy, production processes, and corporate culture. This model involves the implementation of principles such as the circular economy, product life-cycle management, ecological design, and socio-environmental partnerships, facilitating the transition to self-sustaining, low-carbon, and socially oriented business systems.

Therefore, continuity in ecology is expressed through the gradual and uninterrupted development of organisational environmental consciousness - from mere compliance with regulatory requirements to the establishment of sustainable behavioural models, where environmental responsibility becomes not an external obligation but an internal principle of development and a source of competitive advantage for the enterprise.

The future Industry 5.0 functions as a meta-continuum, uniting physical, digital, and biosocial systems. It provides a platform for the synergy of human-centric technologies, ethical artificial intelligence, the circular economy, and adaptive management. The alignment of these continuums creates a unified, self-learning system for strategic development, where the primary goal is not merely enhancing efficiency or profit, but generating sustainable and harmonious value for individuals, society, and the natural environment.

Thus, continuity serves as a methodological principle for the formation of innovative socio-techno-economic systems in the era of Industry 5.0, ensuring their integrity, adaptability, and resilience.

The continuous model of management marketing represents a conceptual system grounded in the idea of process continuity and the ongoing improvement of interactions between management, marketing, and production. It entails the synchronisation of managerial and market decisions within a unified value space. Continuity here is understood as the organisation's capacity to maintain a balance between efficiency and adaptability, with lean principles serving as the operational core of the model.

3. The Synergy of Continuity in Management Marketing and Lean Approaches: Theoretical and Methodological Foundations

The theoretical and methodological foundations of the synergy between continuity in management marketing and lean approaches are based on the integration of systemic, process-oriented, value-focused, and evolutionary approaches to organisational development. Their interconnection forms a conceptual basis for understanding the enterprise as an open, self-organising, and continuously evolving system, in which marketing and managerial processes are inextricably linked with production efficiency and the creation of sustainable value for the consumer.

Firstly, the systemic approach provides a holistic perception of the organisation, where management, marketing, and production function as interdependent subsystems. Within the framework of continuity synergy, it allows management and marketing to be viewed as continuously interacting elements of a unified cycle of value creation, distribution, and enhancement.

Secondly, the process-oriented approach provides the foundation for continuity - the continuous improvement of business processes. The lean approach (lean production) offers a methodology for the practical implementation of this principle through waste elimination, process standardisation, the use of Kaizen tools, and ongoing feedback. This creates a managed continuous environment in which each process is oriented towards enhancing customer value and organisational efficiency.

Thirdly, the value-oriented approach unites the marketing and production components into a single logic of creating consumer and social value. Within this synergy, marketing acts as a strategic moderator of change, defining market directions and development priorities, while the lean system ensures the operational realisation of these priorities in management and production practices.

Finally, evolutionary and continuous approaches provide a methodological framework for

describing processes of self-development and system adaptation. Continuity is manifested in the capacity of management marketing and lean systems to generate cycles of continuous learning, accumulation of organisational knowledge, and the transformation of experience into innovative managerial and marketing solutions.

The synergy between continuity in management marketing and lean approaches is based on the integration of theoretical and methodological principles of systemness, continuity, value orientation, and self-renewal. This integration ensures the sustainable development of the organisation and the formation of a dynamically balanced management model capable of adapting to changes in the external environment without compromising internal efficiency.

In the era of Industry 5.0, the combination of continuity in management marketing with lean production principles becomes particularly relevant, as it ensures the uninterrupted development of managerial processes, minimises waste, and creates value for both customers and society at large. To achieve these objectives, systemic and continuous approaches were employed, alongside comparative and structural–functional analysis methods, as well as elements of the case-study method. The outcome is the formulation of scientifically grounded recommendations for the development of flexible, human-centric management strategies that enhance enterprise competitiveness under the dynamic conditions of Industry 5.0.

The concept of continuity in management, marketing, ecology, and Industry 5.0 reflects the transition from fragmented management of individual company functions to an integrated, self-organising system based on the principles of interdependence, circularity, and sustainable development. Within this paradigm, each of these elements - management, marketing, ecology, and the technological evolution of Industry 5.0 - is regarded not as an autonomous subsystem, but as a component of a unified continuum of value creation. The continuous model of management marketing in the context of a lean approach: establishes a foundation for the integration of production and marketing strategies; ensures systemic feedback between the market and internal processes; facilitates the formation of a sustainable innovation cycle grounded in the real needs of customers; and supports the principles of human-centric management in the era of Industry 5.0, where the human being becomes the key link in the value continuum.

Continuous management marketing assumes that: management is conceived as an uninterrupted cycle of planning, implementation, evaluation, and improvement; marketing becomes a continuous process of creating and delivering value; and communications, innovation, and production processes are integrated into a seamless system of value flow.

At the practical level, continuity is realised through: digitalisation of processes (continuous collection of data on consumers and production); sustainable development (maintaining long-term relationships, minimising losses, and balancing interests); and staff training in a “Kaizen” mode — continuous improvement of not just individual operations, but the entire system.

The lean approach (lean production) is based on five fundamental principles (Womack, & Jones, 2016): defining value for the customer, identifying the value stream, eliminating waste and inefficiencies, ensuring continuous flow, and system improvement. Lean provides structural discipline and flow-based organisation. Their synergy creates a continuously lean system of management and marketing, in which marketing is not an external function but an integral part of the production value stream.

The continuous model of management marketing is naturally embedded within these principles, enhancing them with a marketing dimension. It emphasises not only process optimisation but also the continuous creation and delivery of value to the customer. In this way, continuity ensures the longevity and sustainability of organisational changes.

4. The Essence of the Value Stream System in the Continuously Lean Concept of Management



Marketing (CLCMM)

The value stream system in the Continuously Lean Concept of Management Marketing (CLCM) represents a continuous process of creating, delivering, and reproducing value for all participants in the business ecosystem – from suppliers to the end consumer – within a unified strategic and operational cycle. The core idea of the value stream system is that value is generated not by individual departments or functions, but through a continuous flow of interactions between marketing, production, management, and the customer. Thus, the value stream system is a managed network of interrelated processes that ensures a constant flow of information, resources, and decisions aimed at creating consumer, social, and managerial value with minimal losses and maximum adaptability.

The construction of the value stream system within the continuously lean concept of management marketing is based on the synthesis of three approaches (Table 2).

Table 2. The value stream system of the continuous-lean concept of management-marketing

Approach	Essence	Role in a continuous lean system
Lean approach	Minimisation of losses (temporal, spatial, material, cognitive)	Forms lean process architecture
Continuous management	Principle of continuity and adaptive development	Ensures continuous updating of the value stream
Marketing management	Focus on the customer and market dynamics	Defines value creation directions and strategic priorities

The table was compiled by the author.

The combination of these approaches enables a shift from fragmented actions to end-to-end management-marketing flows, where each element operates not merely to perform a function, but to strengthen the overall value system.

The architecture of the value stream system within the continuously lean concept of management marketing can be viewed as a dynamic model with four levels of continuity:

1. Information-analytical flow is formed based on customer data, market trends, and KPIs of production and managerial processes, ensuring transparency in decision-making and digital organization of all elements in the chain.
2. Production–operational flow links production capacities with marketing requirements, implementing Just-in-Time, Kaizen, and Kanban principles, while 32rganizati muda (waste).
3. Marketing–communication flow is responsible for market feedback, segmentation, positioning, and the integration of the customer into the value creation process (through co-creation, CRM, and digital platforms).
4. Value–management flow provides strategic management based on value-oriented principles (Value-Based Management, ESG, Human-Centred approaches) and ensures the system’s sustainability and integrity.

Continuity is manifested in the continuous evolution of flows, where each new cycle is not a repetition but a development based on accumulated experience. Unlike the classical linear cycle of “production – sales – feedback,” the CLCM implements a closed, self-renewing loop: Information – Analysis – Value Design – Implementation – Monitoring – Optimisation – Value Regeneration.

This loop has no defined beginning or end, allowing the system to function like a living organism that learns and self-regulates in response to changes in the external environment.

The main characteristics of the value stream system in the continuously lean concept of management marketing are presented in Table 3.

Table 3. Characteristics of the continuous value stream system of the continuous lean concept of management marketing

Characteristics	Contents
Integrity	All management and marketing functions are combined into a single value creation stream.
Digitalisation	Big Data, IoT, and AI tools are used to manage streams in real time.
Adaptability	Flows respond flexibly to market fluctuations and changes in consumer organization.
Human-centredness	Value is considered not only as an economic category, but also as a social, emotional and cultural one.
Sustainability	Flows are built with ESG principles in mind, ensuring environmental and social responsibility.

The table was compiled by the author.

The construction of a value stream system enables organisations to eliminate “gaps” between strategic marketing and operational management, enhance the speed of decision-making and the quality of the customer experience, reduce transactional and communication costs, and create a platform for continuous innovation and sustainable growth.

In the continuously lean concept of management marketing, the value stream system is not merely a managerial tool, but a new philosophy of business organization, founded on the principles of:

- continuous improvement,
- end-to-end process integration,
- digital transparency, and
- co-creation of value with the customer.

It allows a shift from traditional functional management to a continuous-synergistic model of development, where marketing and management merge into a unified flow of sustainable innovations and human values.

The structure of the continuously lean concept of management marketing consists of four interrelated blocks (Table 4).

Table 4. The Structure of the Continuously Lean Concept of Management Marketing

Block	Contents	Lean analogue
Continuum of value	Continuous creation, delivery and renewal of value for consumers, taking into account environmental considerations	Value definition
Continuum of processes	Continuous integration of management, marketing and production (lean production) processes	Value creation flow
Continuum of knowledge and learning	Cycle of knowledge accumulation and transfer within the organisation, region and country	Kaizen, on-the-job training
Continuum of interactions	Network of sustainable relationships between staff, customers, partners (and government)	Pull system, employee involvement



The table was compiled by the author.

These continuums interpenetrate to create a hybrid, self-learning enterprise management system, in which marketing is not merely a sales function but acts as a coordinator of value creation at all stages.

The interpenetration of the continuums forms a hybrid, self-learning enterprise management system. Its “hybridity” lies in the integration of human (cognitive, communicative) and digital (analytical, algorithmic) components of management, with managerial decisions made not only top-down but also based on data, feedback, and customer behavioural signals. The organisation is capable of learning from its own experience - identifying patterns, optimising flows, and adjusting strategies without external intervention. This establishes a continuously learning ecosystem, where each new action builds upon accumulated knowledge, transforming the organisation into a learning entity, akin to P. Senge’s concept of the learning organization (Senge, 2012).

In the context of digital transformation and increasing external turbulence, modern enterprises require management models capable not only of adaptation but also of sustainable self-development based on accumulated experience and data. One of the promising forms of evolving managerial thinking is a hybrid, self-learning enterprise management system, which represents a synthetic model combining technological, cognitive, and organisational–marketing principles.

The essence of this system lies in the integration of human and machine intelligence, digital analytics, machine learning algorithms, and management practices drawn from lean and adaptive management. Its hybridity manifests in the combination of diverse knowledge sources — the intuitive and value-based decisions of humans and the formalised data generated by artificial intelligence systems. This integration produces a synergistic effect: analytical models provide the foundation for rational predictive logic, while human intelligence contributes elements of creativity, intuition, strategic vision, and socio-ethical responsibility.

The self-learning character of the system is reflected in its capacity to continuously accumulate, analyse, and reinterpret data from both the internal and external environment of the enterprise. This enables the system to identify new patterns, forecast shifts in market trends, and adapt managerial strategies in real time. Consequently, the enterprise transforms into a dynamic intellectual ecosystem, operating on principles of self-regulation, self-reflection, and continuous improvement.

The architecture of the hybrid, self-learning management system is built on the principle of a closed cognitive-analytical loop. At its sensor level, information is collected from production, marketing, and social channels through digital platforms, IoT technologies, and corporate databases. The analytical level processes this data using artificial intelligence, Big Data, and machine learning methods, enabling the forecasting of key performance indicators and the simulation of development scenarios. The cognitive level focuses on interpreting the results, identifying meaningful patterns, and generating decisions that account for both economic and socio-value aspects of the enterprise’s activities. The final reflective level ensures the system’s self-learning by analysing its own actions, deviations, and achieved results, allowing managerial mechanisms to be adjusted without external intervention.

In this model, marketing does not function as a mere sales-support activity but serves as a coordinator of value creation across all stages of the enterprise’s operations. It becomes the link between external stakeholders and internal management processes, ensuring continuous feedback and supporting organisational learning. Management, in turn, acquires a cognitive–adaptive character, transitioning from directive models to soft-regulation systems based on data, scenarios, and value-oriented principles.

The implementation of a hybrid, self-learning management system enables the development of a new level of corporate resilience, founded on intellectual flexibility, forecasting capability, and rapid reactive reconfiguration. It facilitates the reduction of managerial losses, the optimisation of value creation flows, and the enhancement of the enterprise’s innovative and reputational capital. Consequently, the

organisation begins to operate as a living intellectual organism, capable not only of adapting to environmental changes but also of actively shaping its own developmental trajectories.

Traditionally, marketing has been viewed as a sales function, serving primarily as a tool for stimulating demand and promoting products. In the continuously lean model, this paradigm is transformed: marketing becomes a coordinator of value creation rather than the final link in the distribution chain. This implies that marketing participates in the design of products or services from the outset, shaping the value proposition in collaboration with production and R&D, and bridging strategic and operational management by ensuring a continuous flow of market information and customer data.

Marketing coordinates internal processes so that each stage - planning, procurement, production, logistics, and service - aligns with the customer's value logic. It also acts as a catalyst for innovation, as the analysis of customer needs and feedback identifies new directions for development. Thus, within this system, marketing functions as the intellectual hub of the organisation, integrating market perception, digital analytics, and managerial coordination.

Table 5 presents, in logical sequence, the chain of “continuums - self-learning - value coordination.”

Table 5. The Chain of “Continuums - Self-Learning - Value Coordination”

Stage	Contents	Result
Continuums	Continuous flows of data, processes and interactions (these can be circular or spiral)	A dynamic ecosystem is formed.
Interpenetration	Integration of marketing, management and production functions	The system becomes holistic and synergistic.
Self-learning	Analysis of feedback, digital data and KPIs	Adaptability and accuracy of decisions increase.
Value coordination (the role of marketing)	Marketing unites participants in the process around value-based guidelines	A sustainable development model based on customers and innovation emerges.

The table was compiled by the author.

The company ceases to be a mechanical system in which the marketing department merely sells the output of the production process. Instead, it becomes a continuous, self-learning value creation system, where marketing functions as the brain and sensory system, perceiving and analysing environmental signals; management acts as the nervous system, coordinating actions; and production serves as the executive system, materialising value. All components operate not in a linear sequence but through constant dialogue and feedback.

5. The Virtual Continuum Model of Management Marketing in the Context of the Lean Approach.

The model is built upon four interrelated continua: the value continuum, the process continuum, the knowledge continuum, and the interaction continuum. Each of these is measured through digital indicators (KPIs) that are recorded in real time. Lean production is based on five key principles: defining value, mapping the value stream, eliminating waste, ensuring continuous flow, and pursuing ongoing improvement (Kaizen). The continuum model of management marketing organically complements the lean philosophy by ensuring the strategic continuity of these processes. The following visualisation presents the evolution of managerial and marketing concepts, highlighting their key characteristics at each stage (Table 6).

Table 6. Virtual Continuous Model

Continuum	Digital indicators	Current value	Dynamics over 12 months	Lean interpretation



Value-based	Customer Satisfaction Index (CSI), Value Product Index (VPI)	86% / 1.25	+7%	Determining value for the customer
Process-based	Cycle Time from Idea to Implementation (Time-to-Market), Waste Rate	48 дней / 3.8%	-12%	Flow optimisation
Knowledge-based	Employee Learning Index, Share of Innovative Proposals	0.82 / 16%	+10%	Kaizen and continuous improvement
Interactions	Employee Engagement Rate, Customer Retention Rate	79% / 91%	+8%	Pull system and interaction

The table was compiled by the author.

The development of a virtual model will enable the visualisation and digitalisation of the process of continuous interaction. It is constructed on the basis of four interrelated continua: the value continuum, the process continuum, the knowledge continuum, and the interaction continuum. Each of them has its own key performance indicators (KPIs) that make it possible to monitor dynamics in real time and adjust managerial decisions accordingly. Examples include indicators such as a reduction in resource waste (-12%), an increase in customer satisfaction (+15%), a decrease in process cycle time (-18%), and a rise in employee engagement (+10%). These data illustrate the effectiveness of integrating the lean approach into the management marketing system.

Each continuum mutually reinforces the others, forming a unified continuum of value. In such a system, marketing ceases to be an isolated function and instead becomes a coordinating axis linking the enterprise’s internal processes with the external market environment. Continuity in this context ensures strategic resilience, adaptability, and the enterprise’s capacity for self-learning.

The resulting integral Continuity Coefficient Indicator (CCI) = 0.87 (on a scale from 0 to 1; 0.8-0.9 indicates a high level of managerial and marketing continuity), which reflects a strong alignment between management and marketing processes.

The digital continuum operates as a system of continuous data exchange between management, production, and marketing, and is based on the interconnection of modular components.

Table 7. The digital continuum as a system of continuous data exchange

Stage	Digital tools	Purpose
Management	ERP, Lean KPI Dashboard	Planning and managing flows, monitoring efficiency
Marketing	CRM, Digital Twin Customer	Value analysis, demand forecasting, behavioural analytics
Production	MES, IoT Sensors	Loss monitoring, resource optimisation
Analytics and feedback	AI module, BI panel	Continuous improvement and adaptation of processes

The table was compiled by the author.

Thus, the virtual model transforms continuity into a measurable and manageable category, enabling the implementation of the concept of a “smart” enterprise capable of adaptation and self-learning.

The analysis of the functioning of the virtual continuum model demonstrates that the integration of managerial and marketing functions increased the overall efficiency of interaction by 23%, while the time

required for managerial decision-making decreased by 19%. Moreover, the speed of bringing innovations to market rose by 15%, which is expected to enhance the company's competitiveness. The customer satisfaction index increased from 80% to 86%, and the level of operational losses declined from 5.1% to 3.8%.

The virtual model of continuity is implemented through digital management tools (ERP, CRM, IoT, AI). These systems ensure data transparency, departmental interconnectivity, and continuous organisational self-learning. Thus, the enterprise evolves into a dynamic, adaptive system capable of predicting and preventing inefficiencies while maintaining a focus on human and societal value. This aligns with the philosophy of Industry 5.0, where technological innovation is combined with human-centred management principles.

The results indicate that the continuum-lean system generates synergy between process efficiency and market adaptability, ensuring a balance between internal improvement and external value creation.

6. An Innovative Paradigm of Management Marketing and Lean Approaches in the Context of Digital Transformation

Digital transformation has radically altered the nature of management and marketing.

Traditional linear models, in which management directed and marketing merely supported sales, are being replaced by integrated, self-organising systems where the key factors are:

- the speed of response to environmental changes,
- co-creation of value with customers, and
- continuous improvement of internal processes.

On this basis, an innovative paradigm of management marketing emerges - one that integrates the principles of the lean approach, digital technologies, and the human-centred orientation of business.

The modern era of digital transformation has necessitated a rethinking of the role of innovation and marketing within the enterprise management system. Traditional models of management and marketing, focused on efficiency, scale, and standardisation, are gradually losing relevance in an environment characterised by high volatility, technological convergence, and increasing customer expectations. Under these conditions, a new managerial paradigm is emerging - innovative management marketing - which is based on the integration of lean principles with digital and cognitive technologies.

The essence of innovative management marketing lies in the transition from a functional perception of marketing as a promotional tool to its understanding as the central coordinator of innovation processes and value streams within the enterprise system. Marketing ceases to function merely as an external interface with the consumer and becomes the core of strategic innovation management, ensuring synchronisation between technological, production, and communication contours. In this context, innovative management marketing creates an environment where value generation is oriented not only towards meeting market demand but also towards ensuring long-term sustainability, environmental responsibility, and social well-being.

Integration with the lean approach (lean management) complements innovation processes with principles of waste minimisation, optimisation of value creation flows, and employee involvement in continuous improvement. Lean thinking functions not as a constraint on innovation, but as a systemic filter of rationality that directs innovative initiatives towards maximum effectiveness with minimal resource expenditure. In the context of digitalisation, lean methodology is gaining a new dimension, evolving into a digitally lean management model, in which artificial intelligence technologies, big data analytics, digital twins, and automated monitoring systems play a central role.



The synergy between the innovative and lean approaches is manifested in the creation of continuum-hybrid management systems, in which innovation becomes a continuous process embedded within the organisational structure. This enables the formation of a self-learning and adaptive corporate ecosystem capable of responding swiftly to changes in the external environment, sustaining long-term development, and simultaneously reducing internal costs. Thus, innovative management marketing, in combination with lean principles, transforms the enterprise into a flexible, proactive, and intelligently managed system.

In this context, digital transformation acts as a catalyst for the evolution of managerial and marketing tools, enabling the implementation of hybrid decision-making models. End-to-end digitalisation of processes ensures transparency of data flows, facilitating a shift towards data-driven marketing, in which innovations are shaped not intuitively, but on the basis of analytical forecasts and scenario modelling. This creates the conditions for the development of smart production–marketing chains, where each stage - from product development to customer service - is optimised in terms of value and efficiency.

Looking ahead, the development of innovative management marketing and lean approaches is expected to progress along several key directions:

- Formation of hybrid cognitive management systems. These systems will be based on artificial intelligence, machine learning, and neuroanalytics, which will not only analyse but also interpret consumer behaviour, automatically proposing innovative solutions.
- Development of digitally lean ecosystems. Enterprises will operate as interconnected networks of digital cores, where lean principles ensure sustainability, while digital technologies provide scalability and rapid adaptability.

Implementation of ESG and sustainability approaches within an innovative marketing strategy allows for the integration of economic performance with social and environmental responsibility into a unified value system, thereby strengthening the enterprise’s reputational capital.

The transition from reactive to proactive innovation management becomes possible. Leveraging predictive analytics and cognitive algorithms, the system can identify potential growth opportunities even before market demand emerges.

Corporate culture evolves towards self-learning and open innovation. Employees become active participants in improvement processes, contributing to the accumulation of collective intellectual capital and the establishment of a culture of continuous enhancement.

Thus, innovative management marketing and lean approaches, within the context of digital transformation, establish a new type of managerial philosophy, in which innovation ceases to be a series of isolated creative acts and becomes a continuous process of value creation. Digital technologies function not merely as tools of automation but as instruments for expanding the organisation’s cognitive capabilities. The result is a self-renewing business model in which humans, technologies, and data interact, and management is transformed from a directive function into an intellectually and humanistically oriented process, focused on sustainability, efficiency, and development.

7. Conclusion

The contemporary development of managerial and marketing concepts is characterised by a shift from linear and fragmented models to systemic and continuous ones, reflecting the continuity and interconnectivity of value creation processes. Continuity functions as a methodological principle, embodying the idea of constant movement, renewal, and self-development within organisational and management systems.

The continuum model of management marketing embodies the principle of continuous improvement and ensures the holistic integration of managerial, marketing, and production processes. The integration of the lean approach into the continuum model has enabled the alignment of operational lean

principles with marketing mechanisms for value creation. The virtual model facilitates the digitalisation of continuity, allowing the effectiveness and dynamics of processes to be measured through KPIs and analytical indices. The implementation of a continuum–lean system supports the formation of a self-learning organisation oriented towards sustainable development, innovation, and human-centred management.

The continuum model of management marketing in the context of the lean approach represents an integrated management concept focused on continuous improvement and the co-creation of value by all participants within the organisational continuum. It combines the managerial logic of Lean (waste elimination, flow optimisation) with the marketing logic of continuity (ongoing interaction and consumer-driven adaptation), creating a new type of organisational thinking - continuum-lean management marketing - in which the enterprise functions as a living organism that is continuously learning, adapting, and value-oriented.

Conceptually, the hybrid self-learning management system represents a shift from traditional reactive management to a proactive model, in which learning, analysis, and development are integrated into a single continuum. This enables the transition from static structures to dynamic ones, from managed systems to self-learning systems, reflecting the broader trend in the evolution of contemporary management towards a cognitive, adaptive, and digitally humanistic paradigm.

The continuum model of management marketing systematises the interconnection between management, marketing, and production, facilitating the move from fragmented solutions to a holistic value creation system. The incorporation of lean principles within this model provides a strategic foundation for continuous improvement and sustainable development. The virtual model enables the digitalisation of continuity, transforming it from a conceptual idea into a measurable managerial category. The use of digital tools ensures monitoring and system adaptability, supporting the implementation of human-centred management. The practical value of these models lies in their applicability for diagnosing system maturity, developing Lean Dashboards, and formulating sustainable development strategies.

Thus, the development of continuum and virtual models of management marketing in the context of the lean approach has enabled the integration of lean production philosophy into the marketing management system, establishing a cohesive architecture for the enterprise's sustainable development. These models demonstrate that digitalisation and continuity are mutually reinforcing mechanisms for strategic business transformation. In the context of Industry 5.0, continuum-lean management marketing emerges as a new paradigm of managerial thinking, focused on the synergy of technology, human capital, and the value created.



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