



THE MARKETING APPROACH TO MANAGING QUALITY 5.0 DURING THE IMPLEMENTATION OF SUSTAINABLE INNOVATIONS

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ABSTRACT

The concept of Quality 5.0 management is formed based on the principles of the Fifth Industrial Revolution and involves the manufacturing companies' focus on high indicators of product and service quality and meeting social expectations and ensuring the quality of life in the conditions of quick digitalisation and intellectualisation. Quality 5.0 would be impossible without Industry 5.0, which led to the emergence of innovative sustainable technological solutions; without Society 5.0, based on the priority of socio-centrism over technologization; and without Education 5.0, aimed at supporting citizens in their desire to expand their knowledge and develop skills as a precondition for the growth of the quality of life and improvement of the economy. Marketing approaches of companies, used in the management of Quality 5.0 of products in the conditions of the digital economy, could be selected depending on the conditions of the business environment, the quality of life (including purchasing power) of consumers, and digital infrastructure which contributes to the promotion of products and services.

The considered aspects of marketing approaches are based on the range of the Sustainable Development Goals of society and economy. Their application should be agreed with companies' capabilities and specifics of socioeconomic and climate development. These aspects of marketing approaches in the management of Quality 5.0 of products could be used effectively in case of adherence to the revealed indicators of efficiency.

In this paper, we strived towards establishing and proving the expedience of the use of the marketing approach in the management of Quality 5.0 in the context of the application of innovative technologies aimed at sustainable development. The novel aspect of this research is due to revealing the capabilities of marketing as a driving force in managing Quality 5.0 in the conditions of digital transformations.



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1. INTRODUCTION

Management of Quality 5.0 is a new philosophy in the activities connected with quality. Its emergence was connected with the policy of sustainable development and socio-centrism, implemented with the help of the interaction of labour resources and technologies (Ali and Johl, 2024). Quality 5.0 is a set of approaches to the management of the company, aimed at the effectiveness of the development strategy using sustainable innovations. These innovations are concerned with the processes of smart production, quality of personnel management, and technology management. Innovative technological solutions are used to achieve new indicators of product quality, of which consumers are informed by companies. The emphasis on the application of sustainable innovations during the manufacture of products and provisions of services is a factor in the attraction of new consumers and preservation of the existing ones.

The influence of globalisation and access to various sources of information led to society's awareness and sensitivity to various threats (including climate risks) and the discrimination of humans and animals. The growth of knowledge and sensibility are the main points of the influence of marketers, who promote products and services within Quality 5.0 management. According to the marketing approach, products and services that are valuable from the position of sustainable development can be promoted; however, companies may also use awareness and sensitivity of consumers as a precondition for convincing them to choose a specific product. Accordingly, awareness and sensitivity are the basis that is used in the marketing programme of companies during the promotion of their products and services created with the help of sustainable innovative technologies. These factors are socio-psychological components of Marketing 5.0.

Since marketing plays an important role in the achievement of the effectiveness of Quality 5.0 management in the conditions of the focus on the application of digitalisation and support of the Sustainable Development Goals, it is necessary to identify its main characteristics, which ensure the efficiency and perspectives of further development. This paper's goal was to identify and prove the experience of using the features of the marketing approach in the management of Quality 5.0 in the context of using innovative technologies, which are aimed at sustainable development. This goal involved the identification of the components of the marketing approach and proving the effectiveness of implementing these components.

2. LITERATURE REVIEW

The methodological framework of this paper contains a range of methods and the author's approach to the

research. Content analysis was utilised for assessing scientific materials and analytical data to reveal the main elements of the marketing approach in the management of Quality 5.0 during the promotion of products and services with sustainable characteristics. The trend method was used to reveal the list of sustainable innovations and digital technologies used for managing Quality 5.0 of products, which are manufactured with the use of digitalisation and intellectualisation. Comparative analysis enabled us to compare results after the implementation of sustainable innovations.

The authors' methodological approach to the assessment of types and efficiency of applying the components of the marketing approach during the management of Quality 5.0 products consists of the following stages:

- Selection of materials with information about marketing programmes and/or promotion of products oriented towards sustainable development and created with the use of sustainable innovative technologies;
- Content analysis of the selected data for revealing the specific features of the marketing approach of companies and establishing sustainable innovations which lie in the basis of the promoted products;
- Assessment of the effectiveness of using the marketing elements and sustainable innovations.

Bakator et al. (2024) systematised and characterised the aspects of the concepts of Marketing 5.0, Industry 5.0, and Society 5.0. According to the authors, aspects of Marketing 5.0 are based on the aspects of Industry 5.0 and influence Society 5.0. Though the list and description of the given range of aspects can be considered exhaustive, the statement of the character of influence is rather debatable. Various movements for the protection of the environment and citizens' rights appeared before the first complex marketing studies or application of marketing approaches that are based on sustainable innovative technologies. Here the mutual influence of the given concepts can be observed, and it creates a synergetic effect.

Nguyen et al. (2025) evaluated and considered consumers' intentions to purchase recycled products or products that can be recycled and do not pose a threat to the environment. The authors recommend that information be brought to consumers about the possibility of achieving positive results in climate management and ecosystem management due to the adoption of an environmental outlook.

Majchrzak (2024) systematised scientific approaches to the process of quality management and its connection with the effectiveness of companies' marketing. Though the author studied this connection in the context of the Fourth Industrial Revolution and digital technologies, he presented an exhaustive list and characteristics of the

process of quality management based on modern technologies connected with effective marketing approaches.

Maljugić et al. (2024) disclosed the specifics of the formation of Quality 5.0 management in the context of Society 5.0 principles. The authors presented a complex model of transition from managing Quality 4.0 to managing Quality 5.0, developed based on the balance of human development, which is focused on technologization and improvement of the quality of life. The universal character of the presented model could be adapted to various business environments and sectors.

Vasilikhina (2024) dwelt on the necessity for regulatory and legal support of the ethics of using AI tools in the process of interaction between humans and technologies. Ursulum and Palaoag (2024) demonstrated the possibilities and effectiveness of using large database analysis within digital apps for studying market indicators. The authors demonstrated the universal character of using this technology for various categories of users and provided insights for understanding the specifics of the application of large database analysis during the development of high-tech products and services.

Kachkanbaeva et al. (2024) presented an assessment of the evolution of the types and categories of corporate information systems and concepts of quality and distinguished the links between the types of these systems and the level of quality management effectiveness.

Maxyutova et al. (2022) performed a socioeconomic evaluation of the labour markets of Kyrgyzstan and Kazakhstan and revealed the factors of their transformations. The value of this research consists in determining the factors of the quality of life in these countries, which could be set in the basis of the model of Society 5.0, which principles must be taken into account during the management of Quality 5.0.

Buitek et al. (2023) presented a list of features determining the company's image and its adherence to the implementation of social corporate responsibility.

In light of the analysed works and the existing research gaps, it is important to further analyse the issue of interaction between Marketing 5.0 and Quality 5.0.

3. RESULTS

It is expedient to assess the aspects of the marketing approach which could be used in the context of managing Quality 5.0 of products manufactured with the use of modern sustainable innovations.

Attention should be paid to the social and environmental significance of products, connected with the formation of

the marketing programme in the context of appealing to consumer values in support of quality of life and environmental protection. Here the focus could be made on the environmental features of materials of which products are manufactured. In the case of the promotion of products manufactured from recycled materials, the marketing programme is based on the manufacturing company's support for waste reduction and responsible consumption.

One of the most promising markets in this sphere is the market of recycled denim. The market leaders are H&M and Levi Strauss & Co. The advantages of transition of manufacturing companies to production of denim clothing from recycled materials (resources) are as follows (Verified Market Reports, 2025): high level of support from consumers (approximately 67 % consumers in the world are ready to buy products with sustainable qualities; the USA and some EU member states have a highly-developed infrastructure for collection of denim clothing waste, which allows manufacturers to have reliable supply of resources for recycling; the cyclical production of denim clothing contributes to environmental protection from the growth of waste which poses a threat to ecosystems. The disadvantages of this transition are as follows: the problem of creating the infrastructure of collection of denim clothing waste in many countries and regions (especially in developing countries); the quality of recycled materials are of the lower level compared to new denim, which is a barrier to the mass transition to production that facilitates ecologization (colour and structure of the material are of lower quality compared to new denim); high cost of recycling of denim clothing waste slows down the process of clothing production from recycled denim (this is particularly true for manufacturers from developing countries issuing low-price segment products, who are not ready to support the environmental initiative if it leads to the growth of prices for this category of clothing).

The effectiveness of the marketing approach used by Levi Strauss & Co. during the promotion and sales of recycled denim products is considered in Table 1.

If the manufacturing company wants to attract consumers through advertising the social significance of products and/or sustainable technologies used during production, it can use different directions. It is expedient to advertise products, a part of the revenue from which will be used for healthcare, education, or victims of various disasters; and products manufactured by employees with special needs, who received their training in the company, which allowed them to become more independent from the society and public authorities and ensure further personal and professional development.

With unlimited access to information, modern consumers cannot be confident in the reliability of information in advertisements, even if it comes from a well-known

company. If the marketing campaign is convincing, people might want to check the advertising information and purchase products to support the social corporate responsibility of the manufacturer. In this case, there is a need for effective management of Quality 5.0 of products. It is necessary to confirm with information that the advertisement is true and that the manufacturer is an important structural link in the achievement of concrete

social Sustainable Development Goals. The mention of the use of leading sustainable innovative technologies in production is an important supplement to the main message about the movement towards the social well-being of labour resources with special needs. The fact that the products are manufactured using innovative technologies could be a sign of effective management of Quality 5.0.

Table 1. Indicators of the marketing approach used by Levi Strauss & Co. in the process of promotion and sales of recycled denim products

	Indicators	Value / Characteristics
	Period of the marketing campaign	January, February and March 2022
2	The main focus of marketing for promoting recycled denim products	Protection of the environment from waste, the disposal of which negatively influences climate (greenhouse gas emissions from burning or pollution of areas from waste disposal). Positive influence on the achievement of the Sustainable Development Goal envisaging responsible production and consumption.
3	New structure of denim material	Viscose (produced from textile and recycled denim with the help of sustainable innovative technologies and modern equipment, which prevent defects and use renewable energy), innovative fibre, and certified organic cotton
4	Circular characteristics of new material (first direction of environmental effectiveness)	It could be used in four consecutive recycles; one item can ensure 4x circularity with the high level of organisation of the infrastructure for denim waste collection. This is a declared indicator of the environmental effectiveness of Levi's and a part of their marketing promotion of new eco-friendly products
5	Characteristics of dyeing of new material and support of industrial saving of water resources (second direction of environmental effectiveness)	The proprietary technology Water<Less® allows saving water used during production and dyeing. This technology has been used since 2013 to regulate water consumption; in 2022, it was improved and expanded by the possibility of controlling chemical element emissions during fabric dyeing (0 % of polluting chemical emissions into the environment during dyeing). This technology is based on the following sustainable innovations: - Digital sensors of control of water consumption for materials processing. Every three months, 16 million litres of water are saved due to consumption control by digital sensors connected to the information system of production management, with the integrated technology Water<Less®; - Digital sensors of control over production materials for denim clothes. Control of compliance with company standards, regulating the level of fabric staining. Water<Less® technology is used to manufacture fabric from recycled denim; it ensures the structuring of fibres. The result of these processes is the possibility of fewer washing cycles and the possibility of a cold wash. This helps reduce energy and water consumption; - Digital sensors of control over the use of pigments are connected with the information system of production management. They regulate spending and precise application of these materials to prevent leaks into the environment. Digital sensors and the information system of production management are sustainable innovations. Implementation of digital sensors for the control of water consumption during production features the following digital (including smart) technologies: - Computer vision (video cameras) to assess the level of water consumption in each typical operation; - Machine learning, which involves technological lines' receiving clear instructions for the production procedures and digital sensors' receiving instructions on the order of control (video monitoring and sensor control); - Large database analysis, which involves assessment of data received with the help of machine learning and sensor technologies. The level of compliance with company standards in parameters of water consumption and other procedures of the production process is assessed. Information about any deviations from the standard of water consumption is reflected in the database in real-time, which is possible due to the analysis of large databases; - Digital twins and neural networks. Each batch of products is a model for the creation of a digital twin, with neural networks forecasting the consumer qualities of the product. The use of digital sensors, which ensure control of quality and precision of dyeing, includes technologies similar to ones applied during the control of the level of water consumption for production from recycled denim.

6	Economic effect of the marketing programme	Net revenues: January-December 2021 – \$5,763.9 million January-December 2022 – \$6,168.6 million January-December 2023 – \$6,179 million The growth of sales of products from recycled denim was observed in the 2nd, 3rd, and 4th quarters of 2022. Promotion of information and marketing communication through various channels was performed in the 1st quarter of 2022. The economic effect of the marketing campaign on the promotion of eco-friendly products is observed mainly during the period of the campaign. Consumers must be constantly reminded of the necessity to pay attention to projects involving responsible production and consumption. Growth of the intensity of addressing the necessity for raising awareness about participation in the sustainable development of territories, countries, and the world on the whole and the use of consumers' sensibility factor to information about climate risks were the basis of the effective campaign of Levi Strauss & Co during the promotion of clothes from recycled denim.
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Source: Compiled by the authors based on Levi Strauss & Co (2022), Levi Strauss & Co (2023), and Levi Strauss & Co (2025)

Using the labour of people with special needs, including neurodiverse individuals (Down syndrome, dyslexia, ADHD, autism spectrum disorder (ASD), etc.) could be not only a direction for social corporate responsibility, which is a part of the marketing campaign. Labour activities of such personnel might provide significant advantages for business, including ones that can be advertised (with 100 % agreement of the personnel, given the ethical norms). Innovative productions that involve high technologies need people with unique qualities connected with attention and ability for continuous analysis of the results from information management systems. There is a need for perseverance and attention to detail, which are seen in people with ASD (Hargreaves, 2025). These people are not particularly effective in selling products but are good with the management of digital smart technologies, including operator work on the assessment of large database analysis. Management of Quality 5.0 could consist in hiring such people for the mentioned jobs. Management of Marketing 5.0 includes the expansion of consumers' awareness that these people can do better than others in quality control of large databases used in high-tech production and that they work to ensure the optimal quality of products. Also, it is important to emphasise in the marketing campaign that selling products that are manufactured with the participation of such personnel will not only meet the high demands of consumers but will also contribute to the improvement of the quality of life of personnel (wages, further career and personal growth, etc.).

A special role belongs to the involvement of people with special needs in the advertising of fashionable clothes. In this case, the company demonstrates to consumers the refusal of clichés and the focus on new needs of society regarding sizes and styles and has a new view of the beauty of a person. Demonstration of new lines of clothes and footwear allowed manufacturers to raise their market positions and increase sales volumes (FasterCapital, 2025). The marketing approach, which involves such measures, is based on socially important priorities (inclusion and adaptability) and contributes to the effectiveness of Quality 5.0 management. An important role in this management belongs to sustainable

innovative technologies. Products that are advertised by people with special needs must take into account the specifics of their worldview and indicators of socio-psychological adaptation; the products must also be universal and be in demand among other people. In this case, psychologists, social workers, and relatives of neurodiverse people must be involved in the design development.

The second important component of the marketing approach in the management of Quality 5.0 of products manufactured based on sustainable innovations, is connected with the safety and health of consumers. These aspects are markets of consumers' sensibility to marketing campaigns of products with high safety and healthcare features.

One example of this is the partnership between Ecolab (an international manufacturer of eco-friendly cleaning and indoor hygiene products, with optimal water consumption options) and McDonald's Australia Holdings Pty Limited (representative of McDonald's Corporation in Australia) in its restaurants during the COVID-19 pandemic. In this period, the two partners led a common marketing campaign on the safety and sustainability of their products and services (Ecolab, 2022). The main aspects of the marketing approach to the management of Quality 5.0 of products manufactured with the use of sustainable innovations are as follows:

- Information about the safety of visiting 1,000 McDonald's restaurants in Australia during the COVID-19 pandemic or ordering takeout. This information was supported by proofs of partnership between McDonald's Australia Holdings Pty Limited and Ecolab, and provision of results of quality and safety of products for cleaning and indoor hygiene. The effectiveness of the partnership was advertised with the help of various marketing channels for product promotion. The messages noted the absence of COVID-19 cases among personnel and visitors. The social effect in the context of safety was 100 % because the statistics of cooperation were positive against the background of the high level of incidence of COVID-19 in Australia. Also, the marketing campaign, which reminded consumers of the safety of McDonald's products and the effectiveness of Ecolab products in

fighting viruses, allowed raising the economic effectiveness. The data on the dynamics of sales revenue of McDonald's Australia Holdings Pty Limited are as follows: 2019 - \$ 1,149.434 million, 2020 – \$1,164.376 million, 2021 – \$1,237.732 million, 2022 – \$1,334.104 million, and 2023 – \$1,436.925 million (Ibis World, 2025). During the analysed period, there was a stable growth of the indicator, including 2020, when many companies faced a decrease in revenues due to the pandemic. The marketing campaign to convince people of the safety of visiting McDonald's restaurants in Australia was confirmed by the authority of two partner companies, which led to positive results.

The effectiveness of the described partnership allowed retaining demand for products and services in McDonald's restaurants in Australia; at the same time, McDonald's revenues decreased around the world during the pandemic. In 2020, the company's revenue dropped by 10 %, equalling 19,208 billion (McDonald's Corporation, 2021).

4. DISCUSSION

We revealed and analysed two key parts of the marketing approach to the management of Quality 5.0 of products, which are developed and manufactured on the basis of sustainable innovations. These parts were formed in the conditions of socio-technological, economic, and climate transformations. Marketing programmes of the leading innovative high-tech companies from various sectors, oriented towards social corporate responsibility, are built on the support of balance between the aspect of responsibility (socio-centrism of various directions and ecologization) and economic stability. The effectiveness of marketing approaches used for the management of Quality 5.0 depends on certain indicators, which include the following:

- Guaranteed fulfilment of obligations within corporate social responsibility, which dispels any doubt of consumers at whom marketing campaigns are aimed. It is also important to appeal to partnerships at the level of high-tech companies with a positive image, which can guarantee the quality of products or services. An additional option of partnership is the interaction between a well-known company with a high positive image in product quality support and fulfilment of social obligations and a new company, which can reach the growth of sales due to cooperation with the leader. If both partner companies are equally effective, it may be possible to reach a synergetic effect from this interaction. Synergy is the basis for making a decision on creating a joint marketing campaign;
- Taking into account social, market, and technological preferences and expectations of consumers at the moment of creation and implementation of the marketing campaign. If there are changes during the campaign, it

would be more effective to change measures within the campaign. Since the development of the Fifth Industrial Revolution determines the character of its main components (Society 5.0, Industry 5.0, Quality 5.0, Education 5.0, and Marketing 5.0), their transformations could lead to a transition to a new stage of the industrial revolution, and its basis would be one of the main competing forces, humans or robots. To support the domination of the controlled social environment, the business sector must ensure the stimulation of human development in the context of an increase in the level of personnel training for their professional readiness for transformations in the digital economy;

- A unique innovative line of products, offered within the marketing programme, which will be supplemented by the above indicators.

5. CONCLUSION

In this research, we proved the effectiveness of using the marketing approach to the management of Quality 5.0 during the implementation of sustainable innovations. The marketing approach is developed by companies depending on the potential, digital infrastructure, and socioeconomic development. The socioeconomic development of the country, which is reflected in the level of income of citizens and effective demand, predetermines the character of the marketing approach of companies aimed at using sustainable innovative technologies which contribute to the management of Quality 5.0.

Developed countries (including the USA, Australia, and EU countries) have a large potential for implementing sustainable marketing programmes, which declare the achievement of Quality 5.0. This is connected with consumers' readiness to pay more for eco-friendly products and their desire to become participants in transformations for the purpose of sustainable development.

Developing countries are not yet able to ensure the quick growth of Quality 5.0 and its management during digitalisation and intellectualisation. Marketing approaches, which are used by companies in developing countries, could involve the focus on the above factors (awareness of the necessity for responsible influence on climate and sensitivity to climate change and social threats). In this case, products and services of the corresponding price segments could be advertised and sold. These countries' participation in responsible consumption could be initiated by manufacturing companies, which would be an important contribution to the sustainable development of the countries. New marketing mottos and messages could be offered, to facilitate the growth of environmental and social awareness of consumers in developing countries.

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