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DIGITAL TRANSFORMATION IN HEALTH CARE AND ITS MARKETING DIMENSION

TRANSFORMACJA CYFROWA W OCHRONIE ZDROWIA I JEJ WYMIAR MARKETINGOWY

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ABSTRACT

Purpose: To present issues treating digital transformation in the health sector and highlight the marketing dimension of this process.
Design/Methodology: The article is a literature review of digital transformation, healthcare, management, marketing and health economics. The analysis was carried out using professional, scientific databases based on the desk research method. The study consists of the following parts: introduction; methodology of the study; issues concerning the process of digital transformation, ; digitisation of the health sector in the context of data security and benefits for stakeholders; practical aspects of implementing digital technologies in health care; generations X and Y- in the process of digitisation of health care in the marketing dimension; limitations of the study; conclusions and practical implications.
Findings: The COVID-19 pandemic has significantly accelerated the digitisation of medical services, translating into the rapid development of various e-health platforms and tools. The latest techno-technological solutions for mobile health help in daily patient care and support prevention and preventive health care. The marketing transformation process parallels the digital transformation process in health care. . The availability of digital health tools would not be possible without marketing.
Limitations: Limitations of the study were identified that may have affected the overall picture of considerations. First, only articles indexed in selected databases were used: Google Scholar, ResearchGate, Taylor and Francis Online and ScienceDirect. Second, the literature search used a specific combination of words using Boolean operators.
Originality/value: The treatment of issues treating the digital transformation of the health sector and its marketing dimension is based on the latest literature on the subject, enriching the existing body of scholarly work on the health and marketing industry.

Key words: digital transformation, artificial intelligence, health care, marketing, patient, generations X and Y

ABSTRAKT

Cel: Zaprezentowanie zagadnień traktujących o cyfrowej transformacji w sektorze zdrowotnym oraz zwrócenie uwagi na marketingowy wymiar tego procesu.
Konstrukcja/Metodyka: Artykuł jest przeglądem literatury z zakresu transformacji cyfrowej, opieki zdrowotnej, zarządzania, marketingu i ekonomiki zdrowia. Dokonano analizy w oparciu o metodę desk research, korzystając z profesjonalnych naukowych baz danych. Opracowanie składa się z następujących części: wprowadzenia; metodyki badania; zagadnień dotyczących procesu transformacji cyfrowej; cyfryzacji sektora zdrowotnego w kontekście bezpieczeństwa danych oraz korzyści dla interesariuszy; praktycznych aspektów wdrażania technologii cyfrowych w ochronie zdrowia; generacji X i Y w procesie cyfryzacji ochrony zdrowia w wymiarze marketingowym; ograniczeń badania; wniosków i praktycznych implikacji.
Wyniki: Pandemia COVID-19 znacznie przyspieszyła cyfryzację usług medycznych, co przełożyło się na dynamiczny rozwój różnych platform i narzędzi e-zdrowia. Najnowsze rozwiązania techniczno-technologiczne w zakresie mobilnego zdrowia pomagają w codziennej opiece nad pacjentem oraz wspomagają profilaktykę i prewencję zdrowotną. Równolegle z procesem cyfrowej transformacji w ochronie zdrowia przebiega proces transformacji marketingowej. Dostępność digitalowych narzędzi zdrowotnych nie byłaby możliwa bez marketingu.
Ograniczenia: Zidentyfikowano ograniczenia badania, które mogły mieć wpływ na ogólny obraz rozważań. Po pierwsze, wykorzystano jedynie artykuły indeksowane w wybranych bazach: Google Scholar, ResearchGate, Taylor and Francis Online i ScienceDirect. Po drugie, w wyszukiwaniu literatury zastosowano konkretną kombinację słów z użyciem operatorów boolowskich.
Oryginalność/wartość: Ujęcie zagadnień traktujących o cyfrowej transformacji sektora zdrowotnego i jej marketingowego wymiaru bazuje na najnowszej literaturze przedmiotu, wzbogacając dotychczasowy dorobek naukowy o branży zdrowotnej i marketingowej.

Słowa kluczowe: cyfrowa transformacja, sztuczna inteligencja, ochrona zdrowia, marketing, pacjent, generacje X i Y

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Introduction

Digital transformation is a critical phenomenon in today's global economy. Through its activities, it is forcing customer orientation and a focus on customer needs and expectations. Marketing, also undergoing profound transformations, plays a considerable role in the transformation processes (Mazurek, 2019). In the case of marketing medical services, it is essential to point out its social-creative role in the context of the digitalisation of the health sector. Marketing is now more strongly associated with creating value for the general public. The manifestation of this is the change in the approach to value in marketing, which is

increasingly associated with the resultant customer experience, thus personalising it (Baran, 2013).

The phenomenon of co-creating value with the customer also manifests itself in the healthcare market in the context of digital innovation. E-health platforms and tools respond to the needs and expectations of the main stakeholders in the healthcare system-patients. The coronavirus pandemic has significantly accelerated the process of digital transformation (Baudier et al., 2022; Li, 2021; Park et al., 2022; Pauzi & Juhari, 2020; Schiliro, 2020, 2021), including the health sector (Marx & Padmanabhan, 2020; Wahab & Saad, 2022), which has translated into an increase in innovative technical and technological solutions in medical records, medical services and preventive health care. In reaching the audience for these solutions, marketing communication is essential. The market for medical services is changing, and the marketing product is evolving. The digital maturity of patient customers is increasing, and the requirements for quality medical services are changing. The synergy of medicine, technology and telecommunications should translate into new medical services available to all. The role of marketing here is vast-from informing patients about new products/services to allowing them to learn about new features to getting feedback on digital solutions.

The article aims to present issues on digital transformation in the health sector with attention to its marketing dimension.

Research Methodology

The author used the desk research method. He reviewed the literature treating digital transformation in health care in terms of marketing. The bibliography includes 82 items, including scientific articles, reports, books, chapters from monographs and electronic sources-mainly from 2020–2022. The following scientific databases were used in the desk research analysis: Google Scholar, ResearchGate, Taylor and Francis Online and ScienceDirect. In searching the literature in the mentioned databases, the author used the following combination of words using Boolean operators (AND, OR): 'marketing' AND 'digital transformation' AND ('healthcare' OR 'health care' OR 'health service' OR 'healthcare sector' OR 'health sector' OR

'healthcare industry' OR 'health industry' OR 'health industry' OR 'medicine'). Searches supplemented the collected literature in the databases above for the following keywords: 'blockchain', 'value', 'co-creation', '4P medicine', 'artificial intelligence' and 'machine learning'. The aforementioned scientific databases were used because of the possibility of collecting literature for this article about its purpose.

Digital Transformation-Essence and Significance

Digital transformation looks and runs differently for every organisation or company. Hence it is not easy to point to a single universal definition. At the same time, it signifies a cultural change manifested in constant questioning of the status quo, frequent experimentation and dealing with failure. The process of digital transformation can sometimes also mean moving away from existing, proven business processes to relatively new, still-developing practices (Nius, 2022). Therefore, digital transformation can be understood as a change in an organisation's people, processes, technology and data components, creating an organisation's evolution (McCarthy et al., 2022).

In general, digital transformation refers to a process aimed at improving an entity by inducing significant changes in its operation through the interplay of information, computing, communication and connectivity technologies (Kraus et al., 2021; Vial, 2019). Digital transformation introduces strategy — and customer-focussed changes through innovative information and communication technologies. This process aims to implement improved or new processes in modern organisations (Pihir et al., 2019). Thus, the digital transformation process represents the innovative use of digital technologies to provide better offerings to customers, design efficient operations or create new revenue streams for the business. The technologies used in the transformation process may not be new, but their innovative combination here matters. Hence, strategy, not just technology, is at the core of digital transformation (Chawla & Goyal, 2022; Kane et al., 2015; Vallero, 2019).

The transformation process is aided by digital platforms that create a socio-technical environment that mediates interactions between actors and uses data streams to create value-individual and community value by inducing business users and suppliers to innovate their existing business models (Pietronudo et al., 2022). As mentioned, digital platforms create value. This situation happens in two ways. First, they facilitate transactions and offer technological building blocks to create new products and services (Darius & Maticiuc, 2022; Shan & John, 2022). Transaction facilitation platforms are exchange platforms that create value for at least two different types of users who can benefit from interacting with each other. In contrast, platforms that offer technological building blocks aim to orchestrate industry innovation by co-creating value with external general partners (Hermes et al., 2020).

The importance of digital transformation is immense because it first forces companies to rethink the role and values that guide their business models. Second, it represents a significant change in companies' fundamental pattern of value creation. Third, the transformation process causes a fundamental change in how an organisation thinks and uses legacy systems and tools to reposition part or all of the organisation in terms of value creation (Mugge et al., 2020). Finally, digital transformation helps organisations engage customers in the conception and product development phases, supporting the co-creation (co-innovation) process, which increases customer centricity (Hauke-Lopes et al., 2022; Imran et al., 2021). As one of the critical elements of digital transformation, customer centricity manifests itself in anticipating and shaping customer expectations, managing the customer journey and creating customer communities that communicate market value. Customer centricity focuses on empathy mapping to gain the benefits of reaching the right stakeholders (Pileggi, 2021; Tomièić-Pupek et al., 2021).

The importance of digital transformation should also be considered in reducing the impact of the COVID-19 pandemic, as it forced the rapid and unexpected implementation of digital technologies into corporations' business models and organisational structures. In general, digital transformation has influenced socio-economic recovery, that is to say economic growth, health care and income inequality (Mohamed, 2022),

while its nature and pace were determined by artificial intelligence (AI), changing customer preferences and global crises such as the coronavirus pandemic (McCausland, 2021).

In summary, digital transformation is a comprehensive, holistic concept that enables an overhaul of core processes and changes culture, organisation, relationships and business models. It enables both the delivery of sustainable results in the long term and the value creation for people and organisations. Undoubtedly, the COVID-19 pandemic has awakened and revolutionised how we understand digitality and demonstrated the strategic importance of its transformation (Gabryelczyk, 2020).

Digitisation of the Health Sector-Security and Stakeholder Benefits

Digital transformation in health care is essential in societies' transition to a post-industrial, knowledge-based economy (Garcia-Perez et al., 2022). Digital technology is being deployed in health care to support and improve its traditional operations and create new value propositions for end users of health services (Ghosh et al., 2022). For patients, the digitisation of the health sector enables them to operate in a comprehensive multi-channel environment giving broad access to medical information, education and health monitoring through AI and machine learning (ML) (Kraus et al., 2021). AI technologies could address unwarranted disparities in medical care, reduce medical errors, reduce healthcare inequities, and reduce waste and low-quality, low-value care (Hashiguchi et al., 2022). ML, in turn, contributes to observing sick patients, analysing disease patterns, and diagnosing and prescribing medication. ML helps provide patient-centred care, make therapeutic decisions, and detect sepsis and high-risk emergencies in patients (Quazi, 2022). Deployment of AI systems in health care can further optimise healthcare resources, facilitate a better patient experience, reduce per capita costs and increase the satisfaction of medical professionals and patients (Dicuonzo et al., 2022).

The creation and co-creation of value for patients are mediated by digital platforms that manage the public health ecosystem. This process is

taking place in collaboration with a much more comprehensive range of partners and stakeholders than was previously the case (Hermes et al., 2020). Therefore, the digitisation of health care should ensure a seamless but, at the same time, secure and protected exchange of data, such as medical data, interoperability and patient-generated data. According to Jahankhani & Kendzierskyj (2019), blockchain is a mechanism that can ensure data security and privacy in the health sector's digitisation. Blockchain is a computerised, distributed database of records, transactions and digital events made and shared among connected users (Rejeb & Rejeb, 2020). Another definition states that blockchain is a digital, decentralised, distributed ledger that records and adds transactions chronologically to create permanent and tamper-proof records (Jain & Jain, 2022; Treiblmaier, 2018). Blockchain is shared by a network of computers, allowing customers to securely exchange financial information with suppliers without needing a third party, such as a bank (Peres et al., 2022; Swan, 2015; Yli-Huumo et al., 2016; Zheng & Yu, 2016).

In health care, a blockchain is an effective tool in preventing data breaches, improving the accuracy of medical records, reducing costs (Reddy, 2022), biomedical research, health data analytics, education, health insurance claims, remote patient monitoring or finally in pharmaceutical supply chains (Elangovan et al., 2022). Blockchain technology represents the potential for value creation in health care through compliance achievements, reduction of errors and fraud, better governance, collaborative value creation among entities, intelligent contracts, technology to support charity, greater trust, and integrity. The elements above suggest that blockchain fosters multiple tangible and intangible value creation in the study area for individuals and organisations across the health ecosystem (Spano et al., 2021). Finally, blockchain technology is crucial to developing a platform to manage the COVID-19 pandemic effectively-now and in the future. Currently, the most significant difficulty facing most nations is the lack of a precise mechanism for detecting new infections and predicting their risk. Moreover, such features of blockchain technology as decentralisation, transparency and immutability can help manage a pandemic by detecting infection outbreaks early, speeding up drug distribution and protecting users' privacy throughout the treatment process (Jafri & Singh, 2022).

Technological advances in medicine and, consequently, the digital transformation of the health sector must be accompanied by parallel advances in promoting patient and public participation throughout the process. To this end, perceptions of personalised medicine (4P) and assessments of its value and risks must be better understood. The 4Ps of personalised, preventive (preemptive), predictive and participatory medicine help refocus health services from a focus on treating established diseases to maintaining health and well-being (George et al., 2022; Horne, 2017). It represents a new paradigm of holistic and integrative patient management practices with equal participation of the patient and physician in holistic health care, combining precision medicine and medical experience across the patient's lifetime (Bartold & Ivanovski, 2022). Personalised medicine is otherwise known in the literature as precision medicine (Duffy, 2016; Hussain et al., 2021; Sharma et al., 2022; Verma et al., 2022), stratified medicine (Jorgensen, 2019; Olechno, 2016; Ruppert et al., 2016), individualised medicine (Rahimi, 2016), customised medicine (Miller & Tucker, 2017; Sarvan & Nori, 2021), molecular medicine (Ziv et al., 2016) or genomic medicine (Roden & Tyndale, 2013), which corresponds to the 4P elements listed above (Slim et al., 2021).

Digital innovations in health care provide solutions to unmet health needs. Hence they can take the form of new processes, therapies, tools, medical procedures or innovative approaches to education, training, management and procurement. Digital transformation emphasises the patient experience in delivering and improving health services to discover and identify the needs. Accordingly, healthcare users should be actively engaged in innovation to manage their health consciously. Patients are now co-producers of health services, and thanks to digital technologies, they can play a more active role in decision-making and innovation activities. Healthcare providers who continuously monitor, digitise and analyse patient data can better understand the desires and needs of healthcare users and tailor offerings and care to provide quality services (Santarsiero et al., 2022).

Practical Aspects of Implementing Digital Technologies in Health Care

The digitisation process in the health sector involves using innovative digital tools. They could improve the level of service to stakeholders and streamline the patient registration process. In addition, these IT solutions can direct patients' movement and monitor their health inwards. Using the latest digital technology to monitor such patients helps improve their quality of life and enables attending physicians to intervene immediately in life-threatening conditions.

A critical application of AI in medicine is using algorithms to aid diagnosis in various fields-such as radiology and cardiology. The advantage of AI is that the sensitivity and specificity of the diagnosis are more significant by up to several percent than the diagnosis made by a doctor or team of medical professionals. In addition, the vast potential lies in solutions that support diagnosis at the early stages of the disease, such as cancer or cardiovascular disease (Żochowska, 2022). AI-based technology can reduce preparation times for head, neck and prostate cancers, for example, by as much as 90%, meaning that waiting times for potentially life-saving radiation therapy treatment to begin can be drastically reduced. Critical future AI applications include immunomics, synthetic biology and drug discovery. These will find revolutionary use in cancer, neurological and rare disease space, personalising the patient's care experience (Bajwa et al., 2021). Studies further indicate that AI-based systems can outperform dermatologists in correctly classifying suspicious skin lesions. The advantage of AI systems stems from learning (more and faster) from successive cases and exposure to multiple cases per minute, which is far superior to cases evaluated by a clinician. AI-based decision-making approaches also bring applications in situations of disagreement between experts-for example, the identification of pulmonary tuberculosis on chest radiographs (Amisha et al., 2019).

Further practical applications of AI in the medical industry are support for telemedicine, body composition analysis, prediction of patient response to treatment, and democratisation of prevention (Żochowska, 2022). A key element in the development of e-health is telemonitoring of implantable

devices. This situation is necessary to guarantee continuous, safe, high-quality health care for patients with implantable devices. These devices are new-generation devices that, through Bluetooth technology, allow direct transmission of data from the implantable device to the patient's configured smartphone, from which, with the dedicated application, data are transmitted to the provider through a server provided by the device manufacturer. In this case, it is not necessary to use additional transmission devices (Telemedyczna Grupa Robocza, 2021).

It is important to note that advances in wireless technology have created opportunities to provide on-demand healthcare services through health-tracking applications. Such innovative solutions have enabled a new form of healthcare delivery through remote interactions, available anywhere, anytime. Such services are essential for regions with underdeveloped infrastructure and places that lack specialists. They help reduce costs and prevent unnecessary exposure to infectious diseases at the clinic. Telehealth technology is also essential in developing countries (Bohr & Memarzadeh, 2020). In addition, it passes the test in monitoring and observing elderly and disabled patients who live far from healthcare centres (Finco et al., 2023).

In conclusion, the practical aspects of implementing innovative digital solutions into the day-to-day operations of healthcare entities can be an essential source of building a healthcare entity's competitive advantage in the healthcare market. On the global scale, meanwhile, AI can become a vital tool for improving health equality around the world.

Generations X and Y in the Digitisation of Health Care and the Dimension of Marketing

Today's medical market requires a change in approach to the services offered, which should be personalised and accessible on the patient's mobile devices. The marketing dimension is critical here-namely, the design and communication of relevant medical content and digital applications that meet the expectations of demanding patient-clients. Appropriate patient-centred (patient-centric) activities should be carried out to achieve a positive patient experience. Patient experience management is now a sine qua non and a considerable challenge for the digitisation of health care.

Patient experience is the interaction between the patient and the healthcare provider, integral to healthcare quality. In general, the quality of health care services is determined by easy access to health information, timely appointments and good communication with providers, among other factors. In order to provide patient-centred care, healthcare providers need to understand the patient experience. Evaluation of the patient experience and other elements, such as the safety and effectiveness of care, constitute the only means for the creation of a complete picture of healthcare quality. (Daffodil Software, n.d.). A precise understanding of the patient experience will benefit the healthcare industry and society in many ways, including, among other things, the establishment of tailored and personalised health care (Oben, 2020).

By 2025, generations X and Y will make up about 75% of Polish society (Kozak et al., 2022); hence, there is a need to align with these generations suitable activities and marketing messages that are related to the new digital health services resulting from the ongoing digital transformation of the health sector.

Generation X consists of those born between 1961 and 1983, the communist generation, the Nothing for Real generation, the White Collar generation, the Blue Collar generation (Czerska, 2016), MTV Generation and Gen-Xers (Berk, 2013). People of this generation value work and are even attached to one employer-loyal to it. They often prioritise work responsibilities over leisure despite rejecting the 'rat race'. On the other hand, Generation X are unstable, insecure people, full of doubts-including about themselves. They are searching for the meaning of their existence and are characterised by colourlessness. When handling new technologies, this is not a problem for them (Czerska, 2016). Generation Y, or the Millennium generation, the next generation, the digital generation, the generation of flip-flops and iPods (Bilińska-Reformat & Stefańska, 2016), tech-savvy consumers (Dewalska-Opitek, 2017), generation me (Spinney, 2012), generation WHY, gaming generation, net generation, Facebook generation or iGeneration (Kelan & Lehnert, 2009), are people between 1984 and 1995. They are shrewd, overconfident and even brash at times. They are characterised by believing in their uniqueness and are intensely narcissistic.

On the other hand, generation Y cannot make decisions independently. They expect constant attention, and are also impatient as well as well-educated, with excessive expectations. Compared to Generation X, they prefer flexible employment and freedom of action, which translates into an average working time with one employer of 2 years. Millennials do not respect their bosses, treating work as an avenue for personal development. They are eager to work in teams and are open to new challenges. When it comes to new technologies, they actively use them (Czerska, 2016).

Given the above characteristics of both generations X and Y, which are open to new technological solutions, patients should be included in constructing complex health ecosystems designed to meet their needs.

One of the biggest challenges of digital transformation in the healthcare field is the final measurement of the effectiveness of the personalisation of healthcare services and the impact of patient involvement in the treatment process. Given the attitude of generations X and Y towards work and employer, it is necessary to be flexible in the design of health services and focus, on the one hand, on brand loyalty and attachment, and the other hand, on freedom of choice and frequent change of decisions. Undoubtedly, patients now actively using health services are informed and engaged. They play an active role in the decision-making process in the context of innovative health tools and services: they search for information on preventive health care, health monitoring, specialist doctors, clinics and outpatient clinics, and appointment enrolment, after which they actively use these services and consume the previously searched health services. Thus, such patients can be considered prosumers of e-health services and tools (Wolny, 2013).

According to Deloitte Digital's 2022 report, two post-pandemic patient archetypes in Poland represent their health and digital behaviour. The first group is the so-called Traditional Patients-rarely using digital channels, using up to four apps. This group represents nearly 43% of the population. The second one is the so-called Phygital Patients-frequent users of digital channels but also interested in traditional channels. They make up more than 17% of the population. The Phygital Patient of the future expects the same level of service in all available channels, which complement each other (Deloitte Digital, 2022). This cross-channel model challenges marketing and managers to make each communication channel work

smoothly and meet patient expectations, as the new standard of medical care is becoming an offering that spans multiple touchpoints across traditional and digital channels. Concerning Generation Y, Phygital patients are mainly women of the millennial generation working in large and medium-sized companies. Moreover, it is primarily to this target group that marketing messages about innovative digital solutions should be personalised, as these people are more likely to actively take care of their health when encouraged to do so by digital solutions. Besides, they need convenient access to specialists and multiple functionalities within a single application, such as automatic appointment reminders or the ability to share information about their health with a doctor (Okoniewska, 2022).

Limitations

The article is characterised by several limitations. Firstly, only articles indexed in databases were used in the analysis: Google Scholar, ResearchGate, Taylor and Francis Online and ScienceDirect, which may have resulted in the omission of valuable items on the issues under consideration. Secondly, the literature search in the databases above used a given combination of words using Boolean operators, which could have narrowed the search for relevant items. Selected industry reports and electronic sources were used for the issues under consideration to complete the analysis.

Conclusions and Practical Implications

The goal of the article, which was to present issues on digital transformation in health care and its marketing dimension, has been achieved.

The author's findings, through a review of the literature on the subject, indicate that digital transformation in health care creates new business opportunities to solve various problems in medical practice and enables the creation of values that determine the quality of medical services. Marketing activities become helpful and even indispensable in this process.

The coronavirus pandemic has become a gas pedal, so to speak, of digital health solutions. In the health industry, which until recently was considered traditional or even conservative, the Internet is now the critical tool for learning about products and services, using them, and building opinions about healthcare providers and medical professionals. In parallel with the transformation process of the health industry, a marketing transformation process is taking place. The most critical activities in this process are patient relationship management, patient experience management, patient engagement management, patient-centred marketing, hyper-personalisation of the message/message, business to human (B2H) approach, ML and AI. In addition to the activities above, blockchain technology in the medical sector is also a new and growing phenomenon.

Several practical implications have been developed based on the analysed content of scientific and industry items. First, the transition to remote health care, if only in prevention or preventive care, requires patients to change their mentality and be open to change. Second, the availability of digital tools is impossible without marketing-through promotional campaigns for new e-solutions and presentations of mobile health products. Third, introducing innovative digital tools requires building and using new, complementary communication channels (cross-channel model) between stakeholders in the health market. Finally, blockchain technology could transform existing healthcare management into a more efficient, secure one, potentially creating value across the health ecosystem.

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