International Journal of Multidisciplinary Research and Growth Evaluation.

Digital Transformation in the Health Sector in Greece

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Article Info

Abstract

Our era today is characterized by continuous changes in all areas that affect humans. Modern man faces challenges, opportunities and risks that significantly shape his life. The rapid advancement of technology is a great challenge for modern man, making him a resident of the digital age. This dissertation examines the digital transformation in the health sector in Greece, which was more intense during and after the covid-19 pandemic. The acquisition of digital skills by healthcare professionals and the patient's information through digital services, such as their electronic file, are essential tools for optimizing the provision of healthcare and meeting the patient's needs. Additionally, the use of digital technologies in general in the health sector seems to have a lot to offer.

Introduction

In today's reality, where changes in the digital sector are the biggest and fastest, we live in a digital age very different from the one experienced by humanity in the past. The relentless reduction in the cost of available technology presents great opportunities to be exploited, but also threats, as the traditional boundaries of the healthcare sector expand, causing new competitive pressures in this sector (Kiochos, 2017). The time at which this paper is written is a time of constant change in all areas of human engagement. At a time of significant and diverse challenges for people, opportunities and risks shape human life in all areas. The speed and progress of technology, changing lifestyles, social and cultural changes and global challenges are all part of what concerns health monitoring and personalised treatment approaches for various diseases. At the same time, digital transformation addresses complex issues facing people today. Technology has been part of human life for many years. During this period, technology has evolved rapidly and especially in recent years, steps have been achieved and giant leaps have been achieved in terms of technological progress and evolution. The rapid development of technology has naturally led to digitalization in modern times in areas of development, economy, health, education, but also culture and entertainment. Digital transformation brings significant challenges and opportunities to the fore. Through rapid advances in technology and the development of digital tools, the health sector is becoming a dynamic and innovative space. Digital technology is fundamentally breaking down the boundaries of traditional medicine, leaving room for the development of advanced diagnostics and innovative approaches in healthcare to treat diseases. In addition, digital transformation has a strong impact on the provision of healthcare services, facilitating access

to geographically disadvantaged and limited areas and improving communication between doctors and patients. The digitalisation of healthcare services is the most important factor in transforming the health sector for the future. Digital technologies have the opportunity to completely transform this healthcare sector, but challenges to effectively digitize patient data remain ongoing. Here, of course, global trends, such as, for example, an ageing population and limited government spending, are some of the factors necessary for the effective transformation of the healthcare sector, and digital technology plays an important role in this transformation. The transformation of the healthcare sector is primarily about meeting the needs of the patient, with the patient as the main milestone. Patients will assume the role of "consumers of healthcare services" as they seek control over their healthcare (Collister, 2016). In addition, the health sector is shaped according to the expectations and needs of the new consumer of services of this new healthcare service, who also want an upgraded experience, with key features of personalization, convenience and provision of quality services in the health sector. The expected changes mainly concern the care industry, but also the way care is delivered. Outpatient care is a new way of delivering care that allows people to access health facilities through virtual care. This contributes positively to changing the model of the health system, which focuses on developing service delivery systems for the provision of care. New digital technologies enable this change, offering multiple benefits to both patients and healthcare facilities through increased efficiency, improved productivity and reduced operating costs. Of course, it is worth noting that digital technologies and the digital disruption they bring about have a significant impact on all sectors of the economy. Digital transformation is fundamentally transforming the healthcare system, making it more agile and efficient. Making more efficient use of available resources, setting priorities and reducing waste are the most important benefits for Greek patients. The aim of my work is to understand and harness the potential of digital transformation in health through various aspects, for example telemedicine, artificial intelligence, big data and mobile health. Through this paper, the application of new digital technologies in the Greek health sector is promoted and highlighted. Finally, conclusions are proposed, while the bibliographic sources used are listed.

Results and Findings
Digital transformation refers to the introduction of the latest digital technologies in businesses and services and how they affect today's society. This transformation requires a number of modern technologies, such as cloud computing and artificial intelligence. The sectors most affected are healthcare, transport, telecommunications and energy. The changes caused by these technologies consist of reducing emissions and waste and improving production processes, increasing competition between businesses and introducing new services and products. New technologies and their combinations significantly accelerate digital evolution. Digital development therefore has a profound impact on society and affects new business and operating models. Companies that do not adopt the new business models are the main cause of loss of competitiveness and closure, on the contrary they facilitate the development of start-ups that are "born" in the new reality from scratch and are able to adapt to changes. It is therefore generally accepted that digital

transformation is essential for the survival of old and new companies.The daily lives of citizens seem to be directly affected by the changes taking place in the new digital era. It is concluded that either in the public or in the private sector, those who comply with digital transformation reap more benefits and while their needs change, their consumption habits change. Therefore, businesses need to be prepared for these changes. These changes have a direct impact on organisational culture, business structures, workplaces and value systems. Europe's policy plan for digital transformation has been presented by the European Commission. These are objectives in various areas such as the digital transformation of businesses, digitalisation of public services, skills in a timeframe until 2030. In May 2021, Parliament called on the Commission to overcome the challenges of the digital transformation, seize the advantages and opportunities of the digital age and advance the use of artificial intelligence.

By digital health we mean the improvement of technologies used, practices designed to improve health, as well as health care. The health sector underpins the development of ICT "Information and Communication Technologies". The terms medical informatics, e-health, telemedicine and mobile health are included in digital health (WO, N. D). To improve diagnosis, prevention, treatment and monitoring of health issues, digital health uses ICT services and tools.Therefore, it is necessary to control, manage and monitor habits that may affect human lifestyle and health. The use of artificial intelligence applications, smart devices, internet tools and data analysis is necessary in line with digital health. The ultimate goal of digital health is to put the patient at the center and it does this by personalizing treatment for the patient and improving health care. Digital health will increase health efficiency and improve entry into healthcare (European Commission, World Health Organization 2019. Greece is at a lower level in terms of development in digital health applications compared to European countries. It is important that our country is in 23rd place in terms of digital applications. In electronic health records it ranks 26th and for digital information exchange in 25th place. Therefore, the digital transition in the health sector in Greece is necessary (Zopounidis & Batakis, 2020). Minimizing bureaucracy, reducing the volume of documents and limiting patient movement are some of the advantages of enhancing digital tools in health that concern the entire population. Vulnerable groups will also improve their quality of life, as digital transformation will allow them to communicate directly with health professionals. It is noteworthy that during the covid era, Greece quickly coped with the demands of the situation and activated some health services. Some of these services were e-prescription (intangible) and covid patient registry. Also, for covid contact tracing in order to timely assess the epidemiological risk of the pandemic, digital tools were created. The practices underlying the digital transformation in Greece in the health sector are European and International. New digital health services, which will improve the citizen experience, are also the goal of this transition. The covid-19 pandemic has been one of the most important threats to the health sector worldwide but also a huge challenge for the medical community. The pandemic has triggered the acceleration of digital transformation in Greece's health sector. Many countries in Europe are experiencing positive effects due to digital transformation. Positive evaluations of this intervention include the lower cost of telemedicine services compared to a classic session, patient satisfaction

and reduced hospitalization. In particular, the digital transformation will help citizens to access the health system more easily and improve diagnosis so that they can follow the most appropriate treatment. (Zopounidis & Batakis, 2020). Using digital technology as an operational framework for technological infrastructure, "Smart Hospital" aims to provide healthcare services. This hospital has the patient as its protagonist and aims at the better management of healthcare units. "Smart hospitals" use digital devices to make telemedicine possible. In addition, mobile devices allow healthcare staff to record and monitor patient progress in real time. The coordination of medical care by health professionals will be achieved by the application of these technologies. The digital transformation of healthcare services aims to improve the quality of healthcare services and at the same time reduce costs by increasing the efficiency of healthcare services and minimizing the operating costs of healthcare facilities. Through digital transformation, healthcare professionals will acquire new knowledge, skills and competences in healthcare (WHO n. d, SEV 2020).

With new technologies, hospitals will benefit if they want to create or modify care services. Hospitals through applications such as information and communication technology applications have the ability to analyze citizens' needs and thus enhance the innovation of their services. Research has shown that patient service is positively affected by technological capability. Therefore, to achieve the best care for the patient, managers are looking for ways to accelerate the effectiveness of technology. Through Informatics takes place the exchange of knowledge required for the development of ideas and the development process. Health organisations develop their services more efficiently via the Internet. In addition, IT reduces costs, improves services and increases patient satisfaction. Reforming global health services towards integrated and continuous healthcare can be improved by accessing safe health services from anywhere, anytime. Digital transformation, changes in eHealth, remote data exchange and medical technology are contributing to this. The characteristics of anywhere and anytime healthcare are monitoring and early intervention, self-care, integrated care and social support. Security conditions will deteriorate due to greater collection, monitoring, storage, retrieval and exchange of citizens' information. Globally, healthcare transformation is accelerated by the use of mobile technologies. This also applies to small and medium-sized healthcare businesses, for example pharmacies. Digital technology applications create new possibilities for integrating devices into health services, thus continuously improving the provision of quality services. Service-focused strategies have changed the relationships between vendors and consumers in healthcare, which creates opportunities for pharmacies and mobile health

Digital transformation has helped companies worldwide evolve and benefit from it. The goals set by entrepreneurs are specific, which they have been constantly evolving, since the beginning of the digital transition until now. In particular, some of the advantages are listed below:

The reduction of prices. The transition to the digital age has resulted in various services being severely restricted. Tasks that were once done manually are now electronic, products are made faster and once required time. The purpose of digital transformation is to use Artificial Intelligence to minimize the human factor, thus reducing production and service costs. Therefore, the quality of human life will improve. Efficiency will increase. The main goal of digitalization is to reduce mistakes by performing all tasks that facilitate people in their daily lives. With digitalization it is true that errors can be more easily detected, as systems remain unaffected by unpredictable factors that stand out in the human factor. It is obvious that the aim is to perfect the system so that the effectiveness is maximum.

Improve Customer Satisfaction and maximize productivity. In addition to offering a variety of options, faster and personalized service is a critical element in customer access to services. Of course, digitalisation opens up new "unexplored" paths in national and global law. The purpose of digital transformation is to ensure that companies that use it follow the law, monitor for any new provision of the law, in order to always be informed about law and ethics (Sebastian *et al*).

The European Commission defines Digital Health as "tools and services that take advantage of information and communication technology (ICT) to improve the prevention, diagnosis, treatment, monitoring and management of health issues, as well as to monitor and manage lifestyle habits that affect health. Digital health is innovative and can improve access to and quality of health and increase efficiency across the health sector. "Digital health aims to promote health, manage and prevent diseases, to offer all patients equal access and coverage of their needs using effective digital tools. In addition, sustainability of health models and strengthening resilience (EU. 2018). Digital health is governed by a number of principles, which are important. These are security, confidentiality, efficiency, utility, equity, reliability, connectivity, universality, privacy and validity. The World Health Organization's "the Triple Billion targets" to improve the health of billions of people by 2023 can be achieved with digital health.

Digital health as a term is generic and consists of technologies, applications and systems related to the health sector and patient care. The main forms of digital health are:
1. Mobile Health (m-Health)
2. e-Health
3. Electronic Health Record (HER)
4. Telemedicine
5. Sensors and mobile devices
6. Big data

Digital technology has caused radical changes in the health sector, such as the ability of doctors to support their decisions through health applications on mobile phones, artificial intelligence, robotics and 3D printing. The treatment of patients and effective diagnosis, the ability to monitor and care for patients remotely, i. e. when the patient is at home are results of the use of digital tools. This development concerns all countries, regardless of level, even countries that do not have sufficient infrastructure and resources.

From wellness to patient treatment, there are applications that have been developed due to digital transformation. The development and study of medical products is also an area of use of these digital tools.

Through digital tools, patients can better check their health and doctors can have a global picture of their patient's health as they can access a database. Improving medical outcomes, minimising costs and enhancing efficiency in health systems are the advantages of digital health. Experts estimate savings of $1. 5 trillion to $3 trillion per year by 2030 due to digital technology. Citizens' expectations have changed when it

comes to their health. Personalised and appropriate treatment per citizen is needed through digital services. In the health sector, with digital tools, employees will significantly enhance their work by increasing efficiency and reducing the time required for each incident. For this to happen, it is essential that information is readily accessible at the time it is needed. As follows, you observe the reduction of medical errors, the reduction of patient waiting time, the better service of patients and the creation of trust between patient and doctor.

A 'smart hospital' is a technology infrastructure and care operating framework designed to maximise the use of emerging digital technologies for the benefit of patients and make healthcare facilities operate more efficiently.

At the heart of the "smart hospital" is a central data monitoring unit that collects clinical and operational data from the entire hospital and from outpatient care points to enable centralized data-driven decision-making.

The overall supervision of the system, including shipment and transport management, is activated through this unit as well as the proper functioning of its own facilities and interfaces with third parties such as materials handling.

Thanks to mobile devices, healthcare staff can take images of the patient at any time through the patient's complete medical record, medical test results and a continuous stream of vital patient data collected with the help of mobile devices. Connected medical devices and wearable technologies enable alternative care options, such as virtual care and remote care. This helps doctors and patients to collaborate better, manage the disease better and provide services. The digital transformation in health will only be possible by educating users as well as patients. As changes in health services increase the need for continuing education is essential. Brockers C. *et al*. emphasizes how digitization changes jobs and affects medical work. The medical services provided depend on the telemedicine expertise and knowledge of the people working in the healthcare field. Education in this area is inevitable, as those working in health will have to support their patients in the digitization of healthcare. The ultimate goal is for patients to be educated on electronic health and telemedicine issues with the aim of understanding and accepting them. Another study by Diviani N. *et al*. argues that electronic information related to a person's health affects their behavior and helps the patient to know, understand and be ready for anything that happens to his health. The continued democratization of health care needs further research into the digital divide created between individuals and health care workers. Doctors need to control the information they receive digitally and work with the patient to find the best care. The Papageorgiou Hospital of Thessaloniki is a "smart" hospital. Nursing services are upgraded, patients are more satisfied and costs are minimized as well as productivity is improved due to new digital technologies. In recent years, the need to improve the services provided in the health sector at the lowest possible cost has become more and more intense. The factor that affects the above most strongly is communication. Essentially, doctors, nurses and administrative staff should have direct access to patient files. For hospitals to operate more efficiently, the information they receive must be characterized by security, speed and efficiency, however this is a large expense for the hospital. The health services provided can be improved through technological tools, such as applications related to the patient and the operation of hospital institutions. The Papageorgiou hospital, through the

cooperation of the OTE Group and the Cisco Company, managed to become a "smart" hospital, utilizing digital technologies. More specifically, using mobile phones or tables, the staff gain access to the hospital's information systems, through the wireless voice transmission systems installed by the companies in the area. Additionally, a new call center IP was installed and interfaced with the old hospital IP. With this new facility, staff, patients and their companions gain free access to the Internet, while hospital employees are able to receive internal calls on their personal mobile phones. Using radio frequency identification and object identification technology (RFID) it is possible to locate the location of the main assets of the hospital with the possibility of monitoring them in live time and with an accuracy of one meter. (Delloite 2020). Each room acquired devices with a touch screen (bedside terminals), which can be used by patients to entertain themselves or by hospital staff to facilitate their work. AccuHealth is a health management company that helps people with chronic diseases manage them through artificial intelligence and remote monitoring (telemonitoring). The costs of dealing with chronic diseases worldwide are enormous. Deaths due to chronic diseases amount to 41 million worldwide. Chile has a population of 18 million, of which 5 million suffer from chronic diseases. AccuHealth has given patients tablets and sensors, which help the patient through questionnaires and biometric data collection. Specialized suggestions are also given for many diseases such as hypertension and diabetes as well as medical devices that are certified. AccuHealth compared to other companies in its field can easily identify the patient in emergency and intervene. This is due to the remote monitoring that follows in real time. As the AI has access to records of 2.4 million Chilean patients, it can categorize them accordingly based on various criteria and thus identify patients at risk faster. This can make it easier to identify the patients that the program will help the most. The advantages of using the solution are that the medical complications of patients suffering from chronic diseases will be reduced by 20% to 40%, the cost of treatment will be reduced by 30% within 10 years admissions to institutions will be reduced by 32% while emergency incidents will decrease by 15%. Finally, AccuHealth's solution will save patients 35%.Digital transformation is a huge challenge for all countries. In the Health sector, due to the Covid-19 pandemic, countries were forced to speed up the process. In 2020, Greece presented the Bible of Digital Transformation, which includes the projects that must be developed by 2025. The development of the Individual Health File, the operation of immaterial prescriptions, the covid patient registry and the upgrading of digital infrastructures in hospitals are some of the initiatives developed by the government. The aim of every government is to develop digital reforms that will transform their countries into digital societies. Digital transformation is a challenge for healthcare professionals as they understand that they must take advantage of the advantages of digital transformation so that processes are achieved, patients are satisfied since now the benefits that will be provided will be high. One factor that will influence the digital transformation of the health sector in the coming years is the digitization of health services. As new digital technologies can transform the health sector, there are challenges that are not insignificant. Financial constraints, inability to properly digitize patient data and regulatory barriers are some of these challenges. Additionally, aging populations and limited government

spending, which are global trends, are accelerating the need for digital transformation in health.

In order to effectively implement digital technologies in health, citizens should acquire knowledge and skills in the use of digital tools, cyber security and the protection of citizens' data should be improved, the use of the Internet should be safe for everyone, patients need to trust new technologies and finally health professionals need to be trained in digital technologies in order to cope with the new working conditions. Finally we conclude that digital transformation and digital health in our time are necessary as they will cover gaps that exist in global health coverage, governments will be prepared to respond to a health emergency resulting in healthier populations. Therefore, the digital transformation in health in Greece is imperative and necessary more than ever.

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