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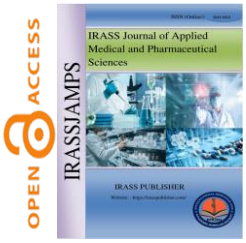

DIGITAL TRANSFORMATION IN HEALTH FACILITIES - SOME THEORETICAL ISSUES AND PRACTICES IN VIETNAM

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Abstract: In Vietnam, digital transformation in health is not only a strategic direction of the Government but also an urgent requirement to improve the quality of healthcare services, modernize the management system, and enhance people's access to health services. As an industry directly related to human health and life, health is under considerable pressure to innovate operating methods, apply technology to professional processes, and governance. For successful digital transformation, Vietnam's health sector needs an overall and long-term strategy, linking technology, people, institutions, and finance. Data standardization, digital infrastructure investment, human resource training, and the promotion of public-private partnerships are top priorities. Most importantly, the digital transformation of health needs to be seen not only as technology but as a comprehensive revolution in the way of thinking about and organizing health activities, towards the ultimate goal: improving the health and satisfaction of the people of Vietnam. The article aims to analyze and clarify the basic contents related to the theory and practice of digital transformation in current health facilities in Vietnam. Accordingly, although digital transformation in health care has been creating great changes in medical examination and treatment in Vietnam in the past period, there are still many problems facing the current digital transformation of health care in Vietnam, namely: the quality of digital transformation human resources is not uniform and lacks of synchronization and data interconnection; the lack of synchronization and data interconnection; building information technology infrastructure.

Keywords: Digital transformation; health; human resources; survival; Vietnam.

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1. Introduction

Digital transformation in health is becoming an inevitable trend to improve service quality, optimize processes, and increase access to health care for people. In the context of the fourth industrial revolution taking place strongly globally, digital transformation has become an inevitable trend in all areas of social life, in which health is one of the industries deeply and directly affected. Digital transformation not only offers tremendous opportunities to improve service quality, management efficiency, and health care but also creates significant challenges for health facilities, especially in developing countries such as Vietnam. In Vietnam, the Party and State have identified digital transformation as a key national strategic task. The health sector is prioritized in this roadmap with many policies, programs, projects, and investments to promote the application of information technology, build a smart health system, improve the quality of medical examination and treatment, and health management. However, the process of implementing digital transformation in health facilities still has many shortcomings, manifested in the disparities in technological capacity between the lines, the shortage of professional human resources, limitations in changing management thinking, and the digital working culture. From that urgent requirement, the study of theoretical and practical issues on digital transformation in the field of health is a matter of theoretical and practical significance in the current period.

Research Questions

- ***Question 1***: How is the content of digital transformation in health understood? What are the specific objectives and fundamental roles of digital transformation in health?
- ***Question 2***: What are the basic issues and solutions to improve the quality and efficiency of the current digital transformation of health in Vietnam?

Objectives

The purpose of the article is to go into the analysis to clarify the basic content related to the theory and practice of digital transformation in current health facilities in Vietnam.

2. Contents

2.1 Digital transformation in health and the goals and basic role of digital transformation in health in Vietnam today

Health in a narrow sense is the prevention and treatment of diseases for people. In a broad sense can be understood as the field

of people's health care activities, from sanitation of the living and working environment, nutrition, disease prevention, to medical examination and treatment... As a specific industry related to human life and health, the activities of the health sector have the following characteristics: Labor in the health sector is very hard right in the process of studying until working officially; Labor in the health sector is often exposed to dangerous pathogens, so the risk of occupational disease is very high; The activities of the health sector are quiet but very sensitive, although operating quietly, the health sector is very sensitive to public opinion. Health digital transformation is understood as the overall and comprehensive application of technology and communication to the activities of the health sector, in order to optimize the management and storage of information as well as improve the quality, efficiency, and user experience. Digital transformation in the health sector includes the use of electronic record systems, mobile applications, management systems, and advanced technologies. Typical components of the 4th industrial revolution include digital technologies such as Big Data, IoT, Cloud Computing, Artificial Intelligence, robotics, virtual reality technology... The goal of digital transformation is to improve the efficiency, quality, and accessibility of health services while optimizing resources, reducing costs, and service times. "Information technology application in health" should not be confused with "Health digital transformation". IT applications often stop at digitizing workflows or building business support software, while digital transformation is a comprehensive, systematic process of change in operating models, governance thinking, and service delivery methods based on digital technology.

Digital transformation in health includes many contents, including the following basic pillars: Digitizing medical data, including digitizing electronic medical records, test results, medical images, and administrative information of patients, etc, to serve the effective sharing, access, and exploitation of data. Business process automation: Using Hospital Information System (HIS), Laboratory Information System (LIS), Picture Archiving and Comunication System (PACS), drug prescription support, medication management, and medical supplies... Telemedicine: Allowing doctors and patients to interact via online platforms, helping to access medical services in geographically disadvantaged areas or during epidemics, and natural disasters... Artificial intelligence (AI) and Big Data analysis: Support diagnosis, disease forecasting, clinical research, treatment decision-making based on big medical data, and personalization. Intelligent interaction with patients: Through mobile applications, medical chatbots, automated response systems, and personal dashboards for patients... Digital transformation is not a destination but a means to achieve strategic goals in health development, including: Improving the quality of medical examination and treatment through a diagnostic support system, and accessing medical information quickly and accurately. Increased efficiency of healthcare facility management, which saves time, minimizes administrative errors and increases transparency. Expand access to health services to people in remote and disadvantaged areas, thanks to online platforms and remote health services. Promote research and health policymaking based on practical data and modern analytical models. In the current context, in the face of the comprehensive impact and influence of the Industrial Revolution 4.0, with the development of Big Data, IoT, Cloud Computing, Artificial Intelligence, robotics, and virtual reality technology, hospitals, and medical facilities can be quickly exploited to help serve patients and customers more effectively. Internet of Things data helps hospitals, facilities, and health management agencies capture data about people's needs, medical examination and treatment habits, and some other characteristics so that they can transfer to them the information that they care about. The exploitation of the Internet of Things data helps hospitals and medical facilities increase their ability to serve the public better and know the needs of patients better; At the same time, it helps them save time searching and performing operations to use the medical services they want. For medical facilities and hospitals with medium and large sizes, there are often many complicated processes, such as the process of receiving patients, medical examination and treatment, daily patient care, dispensing drugs, disease transfer, etc. Therefore, the application of digital technology helps these processes to be more standardized, thereby improving productivity, reducing costs, helping to interact, caring for patients directly and remotely, scientific, fast, high-performance workflows. Besides, with the reception of thousands of patients every day, interacting with patients is a problem that takes a long time for the hospital's medical staff. This necessitates the development of a database of patients. Through cloud computing, it helps to enhance the interaction between patients and doctors; through combining with social networks, such as Facebook, and Zalo, to transmit and provide information, receive feedback from patients quickly; through Blockchain to create a secure database for electronic medical records...Especially in the health industry, digital transformation will create many new operating models, typically the model of examination and treatment for remote patients to help remove geographical distance barriers, reduce hospitalization time, reduce mortality, the remote surgery model, the model of connection between drug manufacturers and pharmaceutical companies, and doctors. Thus, digital transformation will bring many benefits to the health sector, thereby creating more positive changes not only for units in the industry but also for the people. On the other hand, the digital transformation in Vietnam's health sector is also aimed at catching up with the advances in medicine of developed countries.

2.2 The basic problems posed by the current digital transformation of health in Vietnam

In recent years, Vietnam has made remarkable strides in the digital transformation of the health sector, We can mention some typical results such as: Electronic health records and electronic medical records have been piloted in many central hospitals and some localities. The Telehealth platform has connected more than 1,000 healthcare facilities, especially during the COVID-19 pandemic. The application of digital technology in epidemic prevention and control, such as the medical declaration system, disease traceability (Bluezone, NCOVI), testing, and vaccination (national vaccination platform), is implemented synchronously. The health sector database is gradually being built, with systems such as the national database on population, health insurance, health statistics... However, compared to practical requirements and international standards, the digital health transformation process in Vietnam still has many limitations and poses some urgent issues that need to be addressed, as shown:

Firstly, the quality of digital transformation human resources is uneven and lacks data synchronization and interconnection

Implementing the digital transformation of the health sector comprehensively and effectively requires significant digital

transformation resources, including finance, human resources as well and information technology infrastructure. In particular, finance is a big problem for many small clinics and private hospitals because they only have limited capital and funding. The quality of digital transformation human resources is also one of the worrying "bottlenecks" in the implementation of digital transformation in current health facilities in Vietnam. The team of experts is small, the internal human resources are knowledgeable about digital technology is not enough to meet the actual needs, making the ability to achieve success in digital transformation lower. The a shortage of qualified human resources in information technology in health, both at the management level and among professional staff. Many doctors, nurses, and administrative staff are still surprised when using new software, leading to slow deployment or ineffective use. The problem is not only in manipulation skills, but also in changing thinking about management, medical examination, and service delivery in the digital environment. In addition, most health workers – from doctors, and nurses to managers – are traditionally trained, but not equipped with knowledge or skills in digital technology, such as: Administration of health information systems (HIS, PACS, LIS...); Health data analytics; Electronic medical record management; Telemedicine and online medical platforms; Privacy and security of personal medical data. This creates a clear gap between human capacity and the actual requirement to implement digital transformation in healthcare facilities. On the other hand, the health sector also seriously lacks a team of specialized information technology experts who can work for a long time in health facilities. This comes from reasons such as: Wages in the public health system are not attractive enough to retain high-quality IT engineers; The working environment has few creative opportunities, and lack of recognition; There is no clear career position for IT professionals in the hospital's organizational structure; Many hospitals do not have a dedicated IT department or only 1–2 concurrent staff, not enough capacity to operate, maintain and improve the digital system.

Second, the lack of synchronization and data interconnection

The lack of synchronization and data interconnection is one of the "strategic bottlenecks" in the digital transformation of health in Vietnam. This is not only a technical issue but also related to the management mechanism, operating model, and strategic vision for creating a modern digital health ecosystem. Currently, most medical facilities in Vietnam – from central hospitals to district and commune levels – have implemented information technology application software, such as Hospital Information System(HIS), Laboratory Information System (LIS), Picture Archiving and Comunication System (PACS), electronic drug prescribing, Electronic Medical Record(EMR)... However, these systems are largely independent, discrete, developed by many different vendors, and do not comply with a common connectivity standard, resulting in: Disconnection between systems in a healthcare facility. For example, the testing software does not integrate with medical record storage or financial management software. Do not share data between medical routes. A patient transferred from the district to the province still has to be re-examined, re-tested, and lost time and costs. There is no data connection between public and private health or between health and social insurance, making health insurance assessments manual, delayed, and prone to fraud. As a result, the entire health system is operating in a style of "one type per place", "one system per facility", causing waste, inefficiency, and slowing down the pace of digital transformation. It is a fact that due to the lack of strong legal obligations from the central government, the provinces and hospitals have implemented their information systems, not according to the overall architecture of the Ministry of Health or the e-government. This leads to: Fragmentation in investment, overlapping systems, and wasting resources; Data is not standardized from the beginning, and it is difficult to reconnect later. In addition, Vietnam does not yet have a powerful National Health Information Exchange (NHIE) platform to collect, process, and share health data between facilities across the country. The current data governance is still distributed, there is a lack of a unified coordination center, and it is unclear how the entity manages and decentralizes the data. Issues of security, and data sharing between units, also emerged during the implementation of digital transformation, related to the fear of data sharing due to fears of information disclosure, unfair competition between hospitals, or a lack of legal corridors for personal data security. Public and private health facilities often “keep the data to themselves”, preferring not to share it with third parties, leading to data closure for their units.

Third, building an information technology infrastructure

It can be affirmed that information technology (IT) infrastructure is an essential and decisive foundation for the success of digital transformation in the healthcare industry. However, in Vietnam, the current healthcare IT infrastructure still has many limitations, directly affecting the effectiveness of the implementation of industry-wide digitalization programs. One of the serious limitations is the imbalance between health lines and regions in infrastructure investment. Specifically, at central hospitals or large cities (such as Bach Mai, Cho Ray, 108...), IT infrastructure is relatively developed, with data centers, stable transmission lines, specialized software, while at district, commune, and remote areas, many establishments still do not have enough computers for medical staff, poor internet connection, even having to share a computer among many functional rooms. This leads to the inability to deploy electronic health records, electronic medical records, or hospital management systems effectively in localities, which account for the largest proportion of the population. In addition, many healthcare facilities still store data locally, lack a standard data center system, or have not yet applied cloud computing to share and manage data smoothly between units. Fragmented data, scattered on personal computers or internal servers, is not secure. Many medical units at the grassroots level cannot scale the system to meet the storage and processing of large volumes of data, making it difficult to effectively deploy advanced technologies such as Artificial Intelligence (AI), Machine Learning, or Big Data. There is still a situation of "each to their own" in building IT systems that makes the whole health sector lack: national or sectoral overall infrastructure; priority investment roadmap by stage, route, or region; interdisciplinary coordination between health – information technology – finance – investment plan. This has caused a waste of resources, overlapping investments, and the old, uncompleted system has been replaced by the new system.

3. Conclusion

In the context of the 4th Industrial Revolution that has been taking place worldwide, digital transformation is overall inevitable and extremely urgent for the existence and development of the country. Determining the promotion of digital transformation is a major policy, an indispensable direction to ensure adaptation to the

new context, implementing the Party policy and the State's law on national digital transformation to 2025, orientation to 2030, implementing the Government's Project 06 as well as the National Data Strategy to 2030, the Ministry of Health has issued several guiding documents to promote the digital transformation of the health sector, such as the promulgation of the health digital transformation program to 2025, orientation to 2030 (promulgated in 2020); Resolution of the Party Committee of the Ministry of Health on health digital transformation to 2025, orientation to 2030 (promulgated in 2023). Over the years, Vietnam has recorded significant progress in implementing digital transformation in the health sector. However, the implementation process still faces many major challenges. The article aims to analyze and clarify the basic content related to the theory and practice of digital transformation in current health facilities in Vietnam, accordingly, digital transformation in health has been creating great changes in the process of medical examination and treatment in Vietnam. Like other industries, Vietnam's health sector needs to quickly implement digital transformation to promote its development. The article also pointed out and analyzed the basic issues posed for the current digital transformation of health in Vietnam: the quality of digital transformation human resources is uneven and lacks synchronization and data interconnection; the lack of synchronization and data interconnection; and the building of information technology infrastructure. The limitations of the article are that solutions to improve the quality and efficiency of digital transformation in current health facilities in Vietnam have not been mentioned and analyzed.

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