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Status and Trends of the Digital Healthcare Industry

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Objectives: This review presents a comprehensive overview of the rapidly evolving digital healthcare industry, aiming to provide a broad understanding of the recent landscape and directions for the future of digital healthcare. **Methods:** This review examines the key trends in sectors of the digital healthcare industry, which can be divided into four main categories: digital hardware, software solutions, platforms, and enablers. We discuss electroceuticals, wearables, standalone medical software, non-medical health management services, telehealth, decentralized clinical trials, and infrastructural systems such as health data systems. The review covers both global and domestic perspectives, addressing definitions, significance, revenue trends, major companies, regulations, and socioenvironmental factors. **Results:** Diverse growth patterns are evident across digital healthcare sectors. The applications of electroceuticals are expanding. Wearables are becoming more ubiquitous, facilitating continuous health monitoring and data collection. Artificial intelligence in standalone medical software is demonstrating clinical efficacy, with regulatory frameworks adapting to support commercialization. Non-medical health management services are expanding their scope to address chronic conditions under professional guidance. Telemedicine and decentralized clinical trials are gaining traction, driven by the need for flexible healthcare solutions post-pandemic. Efforts to build robust digital infrastructure with health data are underway, supported by data banks and data aggregation platforms. **Conclusions:** Advancements in digital healthcare create a dynamic, transformative landscape, integrating, complementing, and offering alternatives to traditional paradigms. This evolution is driven by continuous innovation, increased stakeholder participation, regulatory adaptations promoting commercialization, and supportive initiatives. Ongoing discussions about optimal digital technology integration and effective healthcare strategy implementation are essential for progress.

Keywords: Digital Health, Industry, Trends, Technology, Precision Medicine

I. Introduction

"Digital health" and "digital healthcare" are terms often used interchangeably to describe a broad field that utilizes digital technologies to improve either health outcomes or the efficiency of healthcare service delivery. According to the World Health Organization [1], these technologies include big data, cloud computing, artificial intelligence (AI), interoperability, the Internet of Things (IoT), blockchain, and other emerging innovations. These advancements are transforming healthcare in multiple ways: AI is advancing diagnosis and treatment; interoperability is ensuring continuity of care; telemedicine enables health and medical management from

remote locations; and various technologies support self-mangement of individual health while simultaneously reducing errors and waste in the healthcare system [2].

Digital transformation is driving a paradigm shift in healthcare from conventional stereotypes toward innovative and integrative approaches [3]. As digital healthcare evolves, it is transitioning from a provider-centric, reactive, and in-person model to a consumer-centric, preventative approach along with the expansion of remote care services. Additionally, treatment is becoming increasingly personalized through the use of individual health data [4].

Beyond traditional healthcare providers, startups and mid-sized tech companies are actively developing innovative digital healthcare technologies. This momentum is strengthened by global giants such as Apple, Amazon, Google, and Microsoft, along with domestic IT leaders like Naver and Kakao. Additionally, pharmaceutical and insurance companies, research institutions, and government agencies are participating in digital healthcare initiatives. This convergence of diverse stakeholders within the healthcare industry is rapidly accelerating the pace of digital transformation [5].

The unprecedented speed and scale of technological advancements and their convergence into digital healthcare result in a constant and massive stream of updates across the industry. Given such industrial environment, it is challenging to capture the entire field's status and trends in a single short review. Nonetheless, considering the inherent connectivity of digital healthcare, periodic reflections and summaries of the industry's overall landscape will be valuable for gaining insights and setting directions from an integrative perspective. This review aims to provide a broad overview of multiple areas within digital healthcare, offering a quick, comprehensive snapshot of the industry's current status and trends.

II. Overview of the Current State and Trends in the Digital Healthcare Industry

First, we will discuss the features of recent trends in the overall industry, and then we will explore the current status and trends of various domains within the digital healthcare industry by sector.

1. Features of Overall Trends

1) Market size and investment trends

The revenue of the global digital healthcare market in 2021 was estimated to be $268.0 billion [6]. This figure dropped to $142.9 billion in 2022, but rebounded to $180.2 billion in 2023. It is projected to reach $549.7 billion by 2028, with a compound annual growth rate (CAGR) of 25% from 2023 to 2028 [7].

South Korea's digital healthcare industry generated revenue of approximately $1.3 billion in 2021, surging to $4.8 billion in 2022 [4,8]. However, it then experienced a decline and is projected to reach $3.5 billion by 2024. The market is forecasted to grow at a CAGR of 4.52% from 2024 to 2028, reaching $4.1 billion by 2028 [9].

Global digital health investment funding increased from $17.9 billion in 2019 to $28.4 billion in 2020, reaching a peak of $52.7 billion in 2021. However, it declined to $25.5 billion in 2022 and further to $13.2 billion in 2023. During this period, the global economy weakened, with growth rates falling to 3.0% in 2022 and 2.6% in 2023, following a 6.2% increase in 2021 after experiencing negative growth in 2020 due to coronavirus disease (COVID-19) [10-12]. Meanwhile, the number of digital health mergers and acquisitions (M&A) doubled in 2023, signaling a growing interest in consolidation as an alternative strategy for startups facing financial challenges [13,14].

2) Technological trends

In recent years, the expansion of AI applications in healthcare has been particularly noteworthy. AI-driven innovation is being widely applied, with significant advances expected in areas such as medical imaging, drug development, disease classification and diagnostics, predictive analytics, and personalized medicine, including treatment and prescription [15].

The global AI-driven digital healthcare market is projected to expand significantly, growing from $15.1 billion in 2022 to over $187.9 billion by 2030, at an annual rate of 37% [14]. Similarly, South Korea's market is expected to experience a high annual growth rate of 45%, with revenue anticipated to reach $1.75 billion by 2025 [16,17].

Since the unveiling of ChatGPT in November 2022, the rapidly evolving field of generative AI—a subset of large language models (LLMs)—is in the nascent phase of penetrating the healthcare sector, with expectations to spearhead future innovations [18]. LLMs are expected to improve patient care by empowering patients, facilitating translation and summarization, enhancing documentation, providing voice-to-text capabilities, leveraging medical knowledge, and simplifying and automating management tasks, as well as providing other critical AI functionalities [14,19,20].

For instance, the generative AI startup TORTUS, based in London, recently secured an investment of $4.2 million for

its AI personal assistant. This technology automatically transcribes conversations between clinicians and patients directly into electronic health records (EHRs) and automates the creation of various clinical documents, all without recording or storing the conversations themselves [20].

Generative AI is expected to improve productivity in the pharmaceutical and medical product industries by 3%–5% of global revenue, which amounts to $600 billion to $1.1 trillion [21]. Most major pharmaceutical companies around the world have already made generative AI a priority [22].

3) Trends in digital healthcare policies, regulations, and legislation

Legal and policy frameworks form the foundation and environment for digital healthcare, playing a pivotal role in its advancement. Numerous countries have begun to enact legislation and introduce policies that embrace and promote digital healthcare, with significant progress actively underway.

In Germany, significant government support has led to the enactment of a preliminary bill in 2019 aimed at expanding digital healthcare systems. In the same year, digital therapeutic applications, known as "DiGA," were included in the coverage provided by statutory health insurance. By December 2023, the Digital Act (DigiG), also referred to as the Acceleration of Digitalization in Healthcare Act, was passed [22]. A major element of this legislation is the electronic patient record (ePA), which is expected to be accessible to all individuals covered by statutory health insurance by 2025, thereby enhancing the exchange and utilization of health data. In the United States, the 21st Century Cures Act was enacted in 2016. This legislation eased regulations and accelerated the approval process by exempting certain digital health-related software from Food and Drug Administration (FDA) medical device regulation. Preliminary guidance was issued in 2017 and 2019, with the final guidance released in September 2022 [4,23,24].

In Korea, a range of policies and legislative measures are being implemented to promote digital healthcare innovation. These measures encompass an integrated evaluation system and an insurance reimbursement system specifically for innovative digital medical devices, the "MyHealthWay" platform, and the right to request data transmission. Further details on these initiatives will be discussed in their respective sectors.

2. Status and Trends by Industry Sectors

1) Classification of sectors within the digital healthcare industry

Due to the expandability, integration, and connectivity of information and communication technologies, it is challenging to distinctly categorize digital healthcare by sector. Often, digital healthcare in one area exhibits attributes of other areas. This ambiguity is highlighted by the fact that various public and private institutions offer different classification systems, without converging on a common standard [4].

In this review, we will apply the classification method which categorizes the digital healthcare industry based on the means or tools of service provision into four groups: hardware devices, software solutions, platforms, and enablers [4]. It is important to recognize that the boundaries between these categories are not always distinct. Given that all products and services in these categories rely on digital technology, many exhibit software characteristics in a broader sense. The "software solutions" category encompasses software that functions independently of any specific hardware, which will be discussed further in a subsequent section. The "platforms" category includes both telehealth and decentralized clinical trials. Meanwhile, "enablers" refer to the operational infrastructure within healthcare institutions and the infrastructure of data systems.

2) Status and trends by industry sectors

(1) Digital Hardware Devices

(a) SiMD

Digital medical devices, abbreviated as SiMD (software in a medical device), refer to medical devices where software is embedded in hardware to collect, analyze, and manage data. An example is the incorporation of AI into ultrasound devices for interpreting examination results. Unlike software existing outside a medical device, these applications are integrated into the respective medical devices.

(b) Electroceuticals

Electroceuticals, a type of therapeutic hardware, utilize electrical stimulation to modulate neural signals, presenting an alternative or complementary approach to pharmaceuticals for the diagnosis or treatment of diseases [25]. In contrast to traditional medications, electroceuticals offer precise and user-friendly treatments by directly stimulating specific nerves. These devices are available in several forms, ranging from implantable to less- or non-invasive wearable options.

Their applications extend beyond specific fields, such as generating artificial heartbeats with cardiac pacemakers or treating neurological symptoms in Parkinson disease patients with deep brain stimulators [26]. A notable example

is Optune, a portable electroceutical from Novocure, which generated $500 million in revenue. It employs tumor-treating fields (TTFields) to destroy cancer cells through physical forces. These fields are applied via electrodes on the skin, selectively targeting cancer cells while sparing healthy ones due to their differing electrical properties [27]. In Korea, YBrain developed the world's first depression treatment electroceutical, Mind Stim, in April 2021, and as of December 2023, it has been adopted by 100 domestic hospitals [28,29].

(c) Wearables

Wearables include all technologies with electronic components and software that can be worn, such as glasses, watches, and clothing. Examples include smart watches, rings, bands, and glasses, which are used with smartphones to receive notifications or manage physical activity. These wearables are examples of the IoT, connecting electronic devices, software, sensors, and more to collect or provide data.

Wearables overcome temporal constraints by facilitating continuous monitoring, which enables disease detection while the device is worn. This enables the maintenance of precise health records outside of a hospital setting and increases convenience for both healthcare professionals and patients.

Recently, the expanding array of measurable data and advancements in sensor technology have broadened the scope of wearables in healthcare. Wearable systems monitor basic physiological signals, including oxygen saturation, blood pressure, and heart rate. They also capture electrophysiological signals such as electrocardiography, electroencephalography, and electromyography using epidermal electronic devices, aiding in the treatment of cardiovascular and cerebrovascular diseases. Additionally, wearable systems track anatomical body movements and diagnose conditions such as diabetes mellitus through wearable chemical sensing systems [30].

Consumers are increasingly adopting wearables such as Fitbit (US) and smartwatches to collect health and exercise data. This data includes step count, activity level, heart rate, sleep patterns and duration, and calories burned during exercise [31]. Abbott's FreeStyle Libre offers continuous glucose monitoring for individuals with diabetes [32].

The use of wearable healthcare technology has surged in recent years, with more than three-fold growth over the past four years. In 2022, approximately one-fourth of the United States population used wearable devices.

In Korea, the establishment of a government fee schedule in February 2022 for wearable electrocardiogram monitors has cultivated an industry ecosystem. This development has spurred product innovation among startups, attracted investments from pharmaceutical companies, and increased their use in clinical settings. Prominent examples include Huinno, which received funding from Yuhan Pharmaceuticals, and SkyLabs, which is backed by Chong Kun Dang Pharmaceutical Corp. Both companies are actively developing wearable electrocardiogram monitor patches [33].

(2) Software solutions

Digital healthcare software solutions are products developed as software applications for diagnosing, treating, managing, preventing, and promoting health within the healthcare domain.

(a) Software as a medical device (SaMD)

SaMD refers to software solutions that function independently of any specific hardware. It is considered a standalone medical device, with functionalities that meet the intended use of medical devices. SaMD is distinct from software in a medical device (SiMD), which refers to computer programs that are integrated into hardware. SaMD can be further divided into diagnostic, therapeutic, preventive, and management applications, each providing unique functionalities.

- **Diagnostic assistance software:** Representative diagnostic assistance software includes AI-based diagnostic solutions. These solutions utilize AI technology to analyze various types of medical data, including electronic medical records (EMRs), imaging data, and pathology data, to derive insights or interpret data for disease diagnosis. In the United States, these solutions are subject to FDA review. In South Korea, they are evaluated by relevant authorities through the Integrated Review of Innovative Medical Devices [17].

In particular, the field of AI-based medical imaging analysis and diagnosis is expected to grow rapidly, from $7.8 billion in 2021 to $12.2 billion by 2027, at an annual average rate of 58.1% [17]. Prominent companies in this sector include Paige (US), which provides pathology-based AI diagnostic solutions for breast cancer, known as "Paige Breast Suite" [4,34]. Within the domestic market, several companies are making significant strides. Lunit, renowned for its imaging detection and diagnostic assistance solutions for lung conditions, branded as "Lunit INSIGHT CXR," recently secured a supply contract with Samsung Electronics in January 2024 [35]. Additionally, Vuno offers specialized AI software for ophthalmic imaging detection and diagnostic assistance, termed "VUNO Med – Fundus AI." Other key players include DeepNoid and JLK Inspection [36-38].

- **Treatment and prevention/management software (DTx):** According to the Digital Therapeutics Alliance (DTA), digital therapeutics (DTx), or digital therapeutic devices, are

defined as "high-quality software programs that provide evidence-based therapeutic interventions to patients for the treatment, management, or prevention of medical conditions or disorders" [39]. While similar to medications in their therapeutic intent, DTx is classified from a regulatory standpoint as SaMD [40]. In the United States, DTx is categorized under SaMD, whereas in the European Union (EU), it is considered Medical Device Software (MDSW) [41]. In Korea, the Ministry of Food and Drug Safety refers to it as "software medical devices" [42].

The global DTx market size is projected to expand from $3.9 billion in 2022 to $17.3 billion by 2030, with a CAGR of 20.5% [16,41].

Unlike traditional medical devices, real-world evidence supporting the effectiveness of DTx is accumulating as patients continue to use them post-market release. This software-centric characteristic facilitates performance improvements and the implementation of personalized precision medicine. Consequently, a distinct approach to approval and reimbursement is required, compared to general medical devices, to support the survival and growth of resource-limited startups that are developing innovative technologies.

Germany has pioneered a groundbreaking reimbursement system for DTx. In 2019, digital health applications (DiGAs) were incorporated into the statutory health insurance fee schedule, enabling reimbursement through the "DiGA fast track." If a DiGA meets all the necessary requirements except for demonstrating positive treatment effects, it can qualify for reimbursement for up to 12 months before proving its effectiveness. As of February 2023, over 40 DiGAs have received approval since the first one in January 2020 [4,23,43-45].

In the United States, the FDA approved Pear Therapeutics' "reSET" app for the treatment of substance use disorder in February 2017, marking the first-ever DTx approval worldwide. Since that milestone, numerous companies have launched DTx solutions, including Better Therapeutics with BT-001 for diabetes and BT-002 for hypertension, Propeller Health with their app for asthma and chronic obstructive pulmonary disease, and Click Therapeutics with CT-132 for migraine [41,43,46]. As of December 2022, 23 DTx products had received FDA approval, and by 2023, over 40 DTx products were slated for commercialization or further development [41,47].

In Korea, the "Integrated Review and Evaluation of AI and Digital Innovation Medical Devices" system underwent significant reforms and was implemented in October 2022 [42]. This reform has considerably shortened the review and evaluation period. Additionally, the revised health insurance registration guidelines for digital therapeutic devices and AI related to innovative medical technology, introduced in August 2023, now allow digital therapeutic devices to enter the reimbursement system under "temporary registration" (3 years). This enables health insurance coverage for 3 years without substantiation of clinical evidence. Once the digital therapeutic devices enter the coverage and are used in clinical settings, they can accumulate real world evidences. After 3 years, formal registration can be acquired contingent upon the substantiation of evidence [48-51].

Through this system, Aimmed's Somzz, a personalized mobile app for insomnia treatment, became the first domestically authorized DTx in February 2023. Subsequent authorizations were granted for Welt's WELT-I (cognitive-behavioral insomnia treatment), Newnaps' VIVID Brain (cognitive therapy), and ShareandService's EasyBreath (respiratory rehabilitation) between April 2023 and March 2024 [41,52].

(b) Non-medical health management software solutions
Non-medical health management software includes services delivered via software applications, providing a variety of health-focused services including diet, fitness, beauty, sleep habits, exercise routines, psychological and mental health management, medication schedules, and the prevention and management of chronic diseases such as hypertension and diabetes. The heightened interest in health and the necessity for self-care during the COVID-19 pandemic have contributed to a significant increase in the availability of health management apps on the market [4].

In Korea, to address the ambiguity between medical and non-medical practices and to facilitate the development of health management services, the Ministry of Health and Welfare released the "Non-Medical Health Management Service Guidelines and Casebook" in two phases: initially in 2019 [53], followed by a second edition in 2022 [54]. The latest revision broadened the legal scope of healthcare services related to chronic disease management, encompassing a wider range within diagnosis, prescription, and referral by healthcare professionals [55].

The "Non-Medical Health Management Service Certification Pilot Project" was launched to certify services that are effective and appropriate. This certification system categorizes services into three categories: chronic disease management, lifestyle improvement, and health information provision [54]. In October 2022, the pilot project awarded certifications to 12 services, among them Doctor Diary (diabetes care by Doctor Diary Co.) and Rody (exercise, diet, and sleep care by GI VITA Co.) [56].

Globally, companies such as OVIVA (a weight loss app solution in Germany), Noom (exercise and nutrition coaching in the United States), and Calm (sleep and meditation in China) are prominent examples in this field [4].

(3) Digital platforms

(a) Healthcare platforms and telehealth

The COVID-19 pandemic has significantly transformed healthcare by accelerating the adoption of remote services. Previously limited in use, telehealth, or remote healthcare, has reached a pivotal turning point. Regulatory frameworks in various countries have evolved, allowing for the temporary or permanent expansion of telehealth services. This evolution has spurred a surge in healthcare platform companies that connect healthcare professionals with patients, offering services such as remote consultations and prescription deliveries.

The global telehealth market is poised for significant growth, with projections indicating an increase from $613 billion in 2021 to $3.42 trillion by 2028, with a CAGR of 23.2% [57]. Prominent telehealth companies worldwide include Zoom, Cisco Systems, Doxy.me, Amwell, Teladoc Health, and MDLive in the United States; Doctolib in France; and Line Healthcare in Japan [57-59]. Major corporations such as Amazon, Walmart, and Microsoft have also made inroads into the telehealth sector through subsidiaries or through mergers and acquisitions [59]. Additionally, players from the retail industry, such as CVS and Best Buy, have ventured into this space, offering a mix of telehealth services, retail medicine, integrated finance, and delivery systems. Health insurance providers such as Cigna, along with financial institutions like US Bank, have engaged in this expanding market as well [14,22].

In Korea, more than 30 remote platform companies are actively competing. Leading players provide comprehensive services, while newcomers concentrate on specific medical services. Prominent among these companies are DoctorNow, which offers telemedicine, prescription delivery, and health consultations; CareLabs, recognized for its "Goodoc" platform that facilitates telemedicine and hospital reservations; and VIVROS, which provides the "Ttokdak" platform for managing reservations and admissions [60].

Telemedicine refers to a telehealth field which primarily encompasses clinical services. This field can be further divided into telemonitoring, storage and transmission, and interactive telemedicine. The telemedicine market is projected to expand from $102.9 billion in 2022 to $893.7 billion by 2032, achieving a CAGR of 24.13%. There has been a global trend toward the expansion and activation of telemedicine services following the pandemic. In the United States, the expansion of health insurance coverage for telemedicine is notable, supported by increased government investment [59]. Telemedicine represented a mere 0.2% of health insurance claims at the beginning of 2020 but surged to 5.1% by November 2023 [57]. Between 2019 and 2022, over 10 new fee codes covering telemedicine were introduced for Medicare and Medicaid. In Japan, online services are now available for initial consultations as well as follow-up appointments. Meanwhile, China is focused on developing a telemedicine ecosystem centered around online hospitals [59].

In Korea, discussions continue regarding the smooth introduction of telehealth policies and necessary legal adjustments [61].

(b) DCTs

Decentralized clinical trials (DCTs) are clinical trials where investigational drugs are delivered by mail, and clinical data is collected either remotely from wearables and mobile devices or through hybrid methods combining on-site and remote acquisition of data. Unlike traditional clinical trials that are conducted at specific physical locations, DCTs bypass geographical and temporal limitations, providing enhanced flexibility. This model is anticipated to improve various facets of clinical trials, including participant recruitment, trial progression, cost-effectiveness, and overall participation, thereby expediting the drug development process. The market for DCTs is experiencing rapid expansion, with forecasts predicting an increase from $25.9 billion in 2022 to $126 billion in 2026 [62].

For DCTs to be executed smoothly, regulatory enhancements are crucial. In May 2023, the US FDA issued guidelines titled "Decentralized Clinical Trials for Drugs, Biologics, and Medical Devices," which offer recommendations covering the entire process of conducting DCTs [63].

In Korea, clinical trials are regarded as an medical practice. Consequently, regulatory amendments are essential to facilitate remote medical practices and foster a supportive environment for DCTs. Discussions and efforts to address these regulatory changes and activation measures are currently underway [64].

(4) Digital enablers

Digital enablers refer to the infrastructure and systems that play a foundational role in digital healthcare. They include the operational infrastructure that enhances the efficiency of medical service delivery in healthcare institutions and the data infrastructure that underpins the development of digital healthcare technologies.

First, regarding operational infrastructure, the digitaliza-

tion and automation of processes like appointment scheduling and patient management can streamline services, which in turn leads to revenue generation and cost savings. For instance, companies such as Nuance (US) offer solutions for organizing documents based on patient records, while Modernizing Medicine (US) provides diagnosis-specific EHR services, telemedicine, prescriptions, easy payment systems, and hospital management solutions [4].

There is a global effort to establish robust data infrastructure including EMRs (medical records within a single hospital), EHRs (medical records across multiple hospitals), and PHRs (personal health records including personal medical and everyday health records). This initiative supports the integration of digital healthcare, which includes both medical and non-medical health management areas. Efforts to standardize these systems for optimal data utilization are also underway [4].

The global healthcare data industry market is projected to experience significant growth, with estimates ranging from 20.5% to 39% according to various analytical institutions. It is anticipated to expand from $214.5 million to $1.6 billion between 2023 and 2033, based on a 20.5% growth rate. Alternatively, with a 39% growth rate, the market is expected to surge from $336.2 million to $8.8 billion over the same timeframe [65].

Countries and entities around the world are establishing regulations to secure competitiveness in the healthcare data industry. They are also promoting policy initiatives such as constructing big data systems and developing health data relay platforms.

The healthcare big data construction project focuses on the collection, storage, and management of extensive medical and health information. Prominent international initiatives include the "All of Us" project in the United States, the "UK Biobank" in the United Kingdom, the "FinnGen Research Project" in Finland, and the "EU 1+ Million Genome" project in the EU [66,67]. In Korea, the "National Integrated Bio Big Data Construction Project" successfully passed its preliminary feasibility study in 2023. This project aims to create a bio-data bank for 1 million people, with the initial phase set to include approximately 770,000 individuals by 2028 [68].

Healthcare data aggregation and relay platforms allow individuals to collect, store, and manage their medical and health data, and share it with healthcare professionals for health management and disease treatment [67]. Examples from around the world include "Blue Button+" in the United States, "MyKanta" in Finland, and "EHDS" in the EU [69,70].

In Korea, the Ministry of Health and Welfare introduced a national healthcare information relay platform called "Health Information Highway," also known as "MyHealthWay," in 2023. This platform enables individuals to request the transmission of information for themselves and third parties, as permitted by the Right to Data Portability from the amended Personal Information Protection Act of 2023 [71-73].

To promote the utilization of health and medical data, which often include sensitive information protected under the Personal Information Protection Act, the Act on Special Cases regarding pseudonymization was introduced as a component of the Three Data Acts amendment in 2020. This legislation permits the use of pseudonymized data without consent for purposes such as scientific research, statistical analysis, and public interest record-keeping [74].

III. Discussion

This review provides a comprehensive overview of recent developments in the digital healthcare industry. Given the rapid pace of updates and changes in this field, we have provided a summarized overview, similar to an abridged map, to facilitate a quick and thorough understanding of the industry as a whole. We expect that this approach will promote insights that are organically connected and integrated across the industry. As we covered a broad range of the industry areas through this short review, the extensive scope of the industry necessitated some limitations in detail. We hope this review serves as a preliminary guide to understanding the current landscape of digital healthcare.

The digital healthcare industry has continued to grow overall, despite recent setbacks attributed to global economic tightening. With the advent of AI, the sector is set for even greater expansion, fueled by ongoing investments and vigorous M&A activities. The incorporation of AI into electroceuticals, wearables, and SaMD, which includes diagnostic software solutions and DTx, is improving their effectiveness. Additionally, there is a growing trend toward regulatory openness in the medical sector, both internationally and domestically. This trend is leading to a consistent rise in approvals and insurance coverage for innovative digital health products and services.

In non-medical healthcare management, there is a trend toward expanding roles from daily health management to prevention and chronic disease management, bridging the gap between medical and non-medical sectors.

Since the COVID-19 pandemic, digital healthcare platforms have seen significant growth, leading to increased

competition and diversification. The institutionalization of telemedicine continues to evolve, and systems for distributed clinical trials are being established.

Healthcare big data projects and healthcare data relay platforms are being actively developed in major countries worldwide and are now gaining momentum domestically. Each country is making efforts to regulate and implement laws and policies that facilitate the adoption, advancement, guidance, and proper establishment of digital healthcare. These policy and legislative changes, along with technological advancements, play a crucial role in shaping the landscape of the digital healthcare industry.

With ongoing advancements in digital technologies and their responsible integration into healthcare, there is hope for achieving a healthier society through digital healthcare.

Conflict of Interest

Acknowledgments

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