Aspects of Digitalization of Healthcare in India.

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Abstract: Digitalization in the healthcare ensures effective delivery of the services to their consumers and citizens of the nation, and appreciates in a true sense of the Digital Nation India. Internet-communication technology or ICT plays the main role in how health-based data collection is designed delivered and employed by the people. For human well-being and health, the healthcare industry is directly responsible, which needs continuous up-gradation and development. Up-gradation not only improves the healthcare system but also improves the effectiveness and efficiency of it. E-Health has a wonderful blow across the world and has positively prepared us more knowledgeable and more public. This new innocent raised area has the probable to cross time, distance, health-care accessibility and closes the divide in demand between patients and healthcare providers. The health system faces a complex new global mission of recreating and revisiting the infrastructure to unbridge the provision of treatment. In addition to their current technical demands and goals, health care services need to address patients’ emerging expectations, i.e. the patient and public policy criteria. This paper is an attempt to address how the new e-healthcare system situation is a step towards turning India digital, providing a concise overview of the roadblocks in digitalizing health information and important benefits of digitization.

IndexTerms - Upgradation, Digitalization, E-health, ICT, Impact, Technology.

I. INTRODUCTION

Digitalization is finding its path into the average man's life on a very clear basis with changing patterns. Starting from good morning messaging at social media apps to touch kiosks available in different fields such as ATMs purchase to buying things online, there's a prevalence of digitization everywhere. With the accumulation of various areas below the umbrella of digitalization, healthcare is such a vital area that cannot be unnoticed in a nation like India where population increases exponentially at a population density of 455 per square kilometer. For every 1000 of its people, India has 0.7 doctors and 1.1 beds[1]. Now here comes digitized healthcare's position in a major digitization leap. The term "Digitalization" was used in conjunction with computers somewhere in the mid-1950s, and refers to "an organization, company or a country embracing or the use of digital or computing technologies." Innovation is moving India's healthcare sector into the future of sophisticated, effective and linked technologies. Real-time data processing and sensing tools link patients with physicians and testing laboratories. E-Health is the use of health and health care of these in sequence and communication technology (ICTs). This is to be expected as one of today's fastest developing regions.E-health, as explained in the research Journal of Medical Internet Science, is "a rising area in the connection of medical informatics, community health, and industry, concern to health services and facts provided or improved through the Internet and related technologies. Following the related theme, E-Health is described by the European Commission as." the use of new communication and information technology to address the needs of people, patients, healthcare practitioners, healthcare providers, and decision-makers"[2]. With the effective implementation of the Digital India initiative in 2015 and the successful completion of two years, the government has emerged as a way for society and economy, in general, to be digitally driven. To name some out of the long list of successful digital initiatives implemented under the program, we have an online scholarship portal, MyGov.in portal, popular support centers such as Suvedha centers, automated electronic purchases, the introduction of automated repositories such as the National Academic Depository, etc. Government departments ensure that numerous technology projects are efficiently enforced. Not abandoning the much-needed, E-healthcare is in the digitization race too. A joint World Health Organization (WHO) and International Telecommunications Union study highlights how ICT plays a lively role in strengthening women's and children's health, thus reducing maternal and infant deaths by 2015. It is based on a survey that includes data from 64 countries, detailing how E-Health saves women's lives, their babies and infants in a range of pioneering ways[3].
II. Objectives:

Perceiving a progressively increasing middle class and expanded use of the Internet and mobile broadband, India is facing strong demand for reliable and affordable healthcare. India's healthcare industry is self-assured to expand by $100 billion in 2016 to $280 billion by 2020, generating enormous opportunities for healthcare providers and health tech firms[1]. The 12th five-year plan, the government heading to increase healthcare spending from 2022 to 2.5% of GDP and 3%.

- **Healthcare services optimization**: The primary goal of digitization is to provide health services that are efficient, accurate and timely.
- **Improved diagnosis**: Maximized analytical capabilities are provided that were not possible in the traditional system. Medical images such as cardiographs, x-rays, etc.
- **Ensured integration**: The sharing with patient data contributes to clear diagnosis and reliable follow-up response to new data increased.
- **Assured transparency and backup**: Versatility where to find available health records online and offline and what will I find? The problem comes to a halt with the data bridging time and location available 24x7.
- **Integrity and Safety**: To provide open and safe care and resource use facilities.
- **Improved public understanding of health care**: implementation of a program that increases understanding of health resources, medications, doctors available, rating of services rendered, patient legal rights, financial support for health services, and other information as per actual needs.
- **Centralized documentation**: Patient information is generally dispersed throughout the various networks and facilities utilizing several procedures, resulting in centralized access to patient records being inaccessible. A secure and readily available medical record can be the start of successful medical participation.

III. Key Players

Many people are participating in the digitization of health care information as seen in the following figure.

![Figure 2: Key Players in Digitization of Healthcare.](image_url)

i. **E-physician**: Physicians, nurses and tertiary practitioners are part of the healthcare facilities providers. By timely exchange of photographs and examination results with their counterparts, these e-physicians have medical histories in detail, contributing to better diagnosis and treatment. Mobile apps enable patients from every part of the world to share their medical problems with them through one simple form or only a tap on the phone like Mumbai-based' MUrgency' is a mobile healthcare app that helps connect practitioners and rescue people who need emergency medical help[4].

ii. **E-pharmacy**: It's very popular these days to buy and sell drugs online. E-pharmacy is classified into two categories, structured and unorganized subtypes. The integrated e-pharmacy is a licensed pharmacy that provides the customer, or electronic service is offered by an offline licensed pharmacy to purchase medication. The other group, i.e. unorganized e-pharmacies, contains non-prescription ordering of medication. E-pharmacy market is $18 billion and will grow to $55 billion by 2020. Industry experts estimate the market to be generating 3,000-4,000 orders daily [8].

iii. **E-diagnostics**: Patients with approved login-id will access the reports at any time, wherever. Patients will contact the pre-planned schedule; receive their reports and information, all being online. These are well-tracked programs that affirm authority, provide enhanced service and deliver patient comfort. For example, Dr. Lal path lab is a web-based structure allowed by browsers and is an interactive approach developed on its own [9]. The key advantage is the quick processing period and elastic database method.

![Figure 3: e-Diagnostic portal](image_url)
iv. **E-patient**- An e-patient is a health user who is actively interested in his / her medical services, mainly through the use of the Internet and other interactive resources to collect knowledge about the medical problems that concern them or their families[5]. Consumers with direct access to their insurance records can contact health care services without interruption and with minimal waiting time[6].

v. **E-hospital**- It is an electronic portal where one can search for hospital appointments. Electronic OPD consultation, laboratory records, and blood supply are some of the resources they offer. This service was given by 46 hospitals serving 478 services until Sep 2016[7]. The internal management of e-hospitals has increased increasing quality and performance. They promote compatibility, i.e. the need to exchange and merge data from various systems to completely accommodate the technical benefits. Such digitized hospitals incorporate all of their services through their organization. All India Medical Sciences Institute has also been added to the e-hospital list, offering electronic consultation facilities, viewing bill information, laboratory results.

![E-Hospital Portal](image)

vi. **E-insurance**-It is a paperless attempt to administer online insurance plans. Here you can keep all insurance plans under one account, with auto upgrading facility once you buy a new policy. IRDA (Insurance Regulatory and Development Authority) has authorized the registration certificate and has launched the ‘Insurance Registry Program’ allowed to access e-insurance accounts, including NSDL Database Management Limited, Central Insurance Registry Limited, etc. It would high the costs of selling insurance premiums and managing them.

![E-Insurance NSDL portal](image)

IV. Queries and Challenges

- **The reliability**-distributed architecture applies a threshold for performance to network latency.
- **Accessibility**-Healthcare organizations seek to track implementation progress, slowdowns, and unexpected technological mistakes. Unconvincing proof of the efficacy of certain e-Health approaches, such as many nuanced systems, does not necessarily encourage openness, which is one of the most compelling aspects.
- **Performance**-Because of the incredible abundance of health data, researchers such as data analysts need to build algorithms to use easy and well-organized data under time constraints. Issues of compatibility will also add to a minimization of the work system's performance.
- **Implementation of safeguards**-Strict laws must be enforced to limit inappropriate access to medical records of patients, setting in place access management systems to secure health data.
- **Healthcare procedures** are not up to the persuasive mark.
- **Good governance**-Information sharing needs good information governance and security, particularly in the face of an increasing cyber-attack threat. At the national and local level, the action is needed to help organizations securely retain and exchange data, and also to allow people to own and share information should they want to.
- **Limited availability of qualified personnel**-While there is a major shift towards the IT industry, the health sector still feels the pressure of having skilled workers. Resistance to transition from the usual manner in which health care workers operate adds to this. Management techniques such as Continuous Quality Improvement (CQI); Complete Quality Management (TQM) and Business Process Reengineering (BPR) have helped medical personnel, nursing staff, and administrative staff, while patients still have a long way to go as their comprehension is only fractional[10].
- **Capital limitations**-This includes the high cost of health IT equipment and software, high cost of installation and operation and low budget budgets for e-Health applications in hospitals.
V. Advantages of digitized e-health systems

Briefing of Patient-Provider-Payer (PPP) key advantages of digitizing e-healthcare systems.

<table>
<thead>
<tr>
<th>Digitized guidelines on e-health</th>
<th>Patient</th>
<th>Provider</th>
<th>Payer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecare / Telemedicine</td>
<td>Precise diagnosis and a better recovery plan</td>
<td>Convenient access, improved diagnosis, and better care</td>
<td>Low-cost treatment</td>
</tr>
<tr>
<td>Remote monitoring</td>
<td>Energy saver and much more patient commitment</td>
<td>Reduces crises and admissions further</td>
<td>Minimal cost</td>
</tr>
<tr>
<td>Analysis of Data</td>
<td>Effective treatment of patients</td>
<td>Based and hands-on treatment</td>
<td>Healthcare Connect Higher benefits</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Reduces the risk of repeat testing</td>
<td>Enhancement in diagnosis</td>
<td>Less cost</td>
</tr>
<tr>
<td>E-diagnostics</td>
<td>Easy to treat, and easier to detect</td>
<td>Improves quality and reduces hospital cost issues</td>
<td>Reduction in bill</td>
</tr>
<tr>
<td>EMR/HER(Electronic medical record/health electronic record)</td>
<td>Quick link to Expert</td>
<td>Consistent knowledge, improved efficiency, organized decision making, and revised decisions</td>
<td>Lesser amount</td>
</tr>
</tbody>
</table>

VI. Conclusion. According to this analysis healthcare, having access to better information, consistency of interpretation and greater accountability will be the most affected e-service in digital India. Digitizing e-health information is an aggressive plan for cohesively targeting huge numbers of patients in massive geographies in India with best-crafted technologies. The August 2017 issue of e-HEALTH,’ Digital Healthcare: A Game Changer,’ discusses and highlights the role played by advanced technology is changing the Indian healthcare sector. The apparent benefits are like coordinated and tailored patient care, better outcomes of long-term management; fewer corporate and technical limits. Digital health initiatives acceptance and approach depend on having the right information at the right place and the right time for the right person to use. Digital healthcare isn’t only about technology, it is about new ways to solve healthcare problems, create unique patient experiences and accelerate the growth of healthcare providers. Digital healthcare will help system-wide processes and institutions provide more efficient services for a longer period, demonstrating the importance for consumers, clinicians and healthcare systems. This vast digital health sector will continue to develop, grow and evolve, making healthcare worldwide an even bigger symbol.

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VIII. REFERENCES

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