SMART HEALTH CARE: AN IDEAL HEALTH CARE SYSTEM FOR SMART VILLAGE BY INTEGRATING ADVANCED TECHNOLOGIES

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Abstract

The concept behind the "Smart Village" is that technology plays an important role for development rendering to education, power, farming, local business opportunities, improving health care, entrepreneurship, internet connectivity and overall enhancement of rural village dwellers. It is a modern approach for off-grid communities. There are major obstacles for the rural people in accessing the health care services In India. With the wide use of advanced technologies, it can establish a better and smarter health care delivery system as Internet of Things (IoT) is revolutionizing the health care industry by adding up new and advanced technologies to make healthcare efficient, improve access to care, increase care quality and reduce care cost. It will take an important role in delivering health care to people in remote areas by monitoring the health care system through internet connectivity providing emergency notifications and accurate data in real time for better health decisions. It has the potential to bring better health care in reducing mortality rate of the rural areas. The introduction of smart health care will be one the essential strategic approaches to meet the health care services in the rural villages of India. This paper explores the role of the advances technologies in healthcare delivery taking a close look at the smart health care aspects in the perspective of Smart Village.

Keywords: Smart Health Care, Smart Village, Advanced Technologies, Internet of Things.

1. INTRODUCTION

Amidst the challenges of transforming rural India, Smart Village has a foresight for proper planning and development of the villages towards self sustenance by creating local business, making clean and pollution free, green and healthy environment, crime free and disease free, bringing internet connectivity and overall enhancement of rural village dwellers with the co-ordination of various

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community development and welfare schemes of the Government by adopting modern technologies. However, with the India's large population in the rural villages, high rates of poverty and limited resources, the health care system faces difficulties to serve the rural people. It has been stated that there are shortages to preventive care due to lack of access in rural villages. India has inadequate health-care infrastructure and shortage of human resources in the rural village. As a result, the rural villages lacked access to primary health care, particularly for children and expectant mothers often requiring them to travel several miles on foot. But it can overcome the challenges by extending healthcare to more village people, improving quality of care and reducing the cost of care through empowerment of technology applications. Thus, Smart health Care can provide the required health care services to the remote villages through the advantages of technologies via internet of things (IoT) which will provide accessibility, better health outcomes, customized and targeted m-medicines for individual patients in rural villages of India.

2. SMART VILLAGE

The basic concept of Smart Village is to bring together the community efforts and strength of people from various streams by integrating it with information technology in order to provide various benefits to the rural villages. A Smart Village is a program that will enhance local production, distribution, power, knowledge, healthcare, technology, entrepreneurship and internet connectivity in the rural villages. Smart Villages are the need of the hour to bring overall development for better livelihoods that will offer the right solution through technology. It will have access to sustainable energy, good education, health care, productive enterprises and nutrition. This will also enable the villagers to attain healthy and fulfilling lives connected to the wider world. Smart Villages will be connected to towns and cities through information technology and such technologies will surely support the initiatives in Smart Health Care at local, regional and national level.

3. SMART HEALTH CARE AND ITS SIGNIFICANCES FOR SMART VILLAGE

People living in rural areas face major hurdles in accessing the care they need. There are few doctors to provide the essential medical care to all who needed it in Indian states and the cost of the care that is available is unaffordable for the rural people. Therefore, the solution to these problems is a smarter way to deal healthcare through "SMART Health Care." The Systematic Medical Appraisal Referral and Treatment (SMART) Health Care is relaying on the facilities of Internet of Things (IoT) to improve access

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to care, increase quality of care and most importantly reduce the cost of care. The Internet of Things (IoT) is the systems that connect with internet in an exchange of information, tracking, monitoring realizing localization in the health care management. The strong factor of Smart Health Care is the extent of coverage it can provide anywhere in the world. It is a concept of connecting anyone, anything, anytime, anyplace, any services and any network. It is the concept of next-generation that can have great impact on the lifestyle of human being through interconnection. The connectivity of Smart phones, tablets and laptops via 3G/4G connected to a network will play a large role to improve access to health care and involving patients in their own treatment. A good example of SMART health program of George Institute for Global Health India in collaboration with Institute of Biomedical Engineering of the University of Oxford was implemented in Andhra Pradesh. The Village health workers went a short training based on that program and they have shown much better results in accurate identifications and selection of treatment. The Internet of Things (IoT) is set to revolutionize the health-care industry all over the world. Thereby, the Smart Health Care can transform the health care of villages in the following ways:

(i) **Remote Health Care:** Providing access to care through video chat or mobile internet.

(ii) **Technology-enabled health workers and health-care centres: Health care workers will be able to manage patient enrollment, diagnosis, treatment, medication and follow-up through cloud based applications.**

(iii) **Automated inpatient care:** Smart ICU systems for reminders, protocols, alarms, and recording patient data.

(iv) **Electronic medical records:** Easily accessed and consistent medical histories and clinical decision-support systems for improved care across locations and over time.

(v) **Remote monitoring:** Low-cost portable monitors that track health parameters.

(vi) **Big data disease tracking** – uncovering and mapping of disease outbreaks; prevention and containment of epidemics; tracking of progress using smart-phones and social media.

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4. CHALLENGES FOR TECHNOLOGY ADOPTION IN THE HEALTH CARE

The health care delivery environment in India has distinctive challenges such as inadequate infrastructure and a constrained health care delivery work process that further intensify the complexity. The challenges are,

(i)   Short of standards,

(ii) Lack of IT domain knowledge in house,

(iii) Unwillingness of medical, nursing and other staff to adjust to change,

(iv) Apprehensions around technology failures (paper systems appear more reliable) and

(v) Lack of computers and diagnostic equipments—or even reliable electricity.

(vi) Lack of proper vendor support.

5. SUGGESTIONS

To overcome these challenges, actions will be needed by the government and policy makers as well as by the private sector to empower technologies in the rural health care which can be attained through the Smart Village concept adopted for the rural villages. The rural health centres should at least be provided with Internet access, smart phones for health workers and solar or battery based electricity supply. The government could start by making use of technology to improve the capabilities of existing public health centers a top priority by,

(i)   Innovative, simple and low-cost smart-phones technologies,

(ii) A larger, less expensive healthcare workforce,

(iii) State-of-the-art electronic clinical decision support systems and

(iv) Evidence-based, quality-controlled, affordable healthcare for all.

6. CONCLUSIONS

Smart Health Care has the potential to extensively deploy Smart Village model in the coming decade and lead the way for transforming rural health care of India. While the technology adoption in the public health sector is still in a budding stage, it is a long-term process which will need interventions from multiple levels of government, informatics technologies and rural health care systems to bring digital transformation of the health industry that could offer comprehensive improvements in patient and doctor's accessibility, engagement, productivity, and risk mitigation, as well as new revenue and operating paradigms. To enhance and develop the effective health care system in rural areas, SMART

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Healthcare should be an integral part of the Smart Village programs. Therefore, the introduction of smart health care will be one the essential strategic approaches to meet the health care services in the rural villages within the perspective of Smart Village in India.

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