Literature Based Study On Computational Healthcare Systems For Sustainable Solutions

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Abstract: **Medical data released and shared through the cloud are very popular in practice, and information and knowledge bases can be enriched and shared through the cloud. The revolution presented by the cloud and big data can have a huge impact on the healthcare industry, and a new healthcare system is evolving. This is why we need to design a more appropriate health care system to meet the challenges presented by this revolution. Sustainability goals usually refer to money saved, energy conserved, waste diverted, water recycled, or any other easily understood metric. But a clear connection between sustainability and a hospital's mission, in an understandable language and with a factual basis, rarely occurs. The connection between sustainability and mission must extend to effective management of the healthcare environment, social interaction between patient and healthcare provider, community-based healthcare approaches, and the utilization of current technology. The mission must have measurable goals and objectives that support sustainability, and the ability of the health system to thrive in its ecological, social, and economic environment. This paper gives literature based study on healthcare systems for sustainable solutions.**

Key words : **Medical Industry; Complexity; Diversity; Timeliness; Healthcare Systems; Sustainability; Scalability;**

INTRODUCTION

The days of collecting data on electronic health records and other structured formats. Diversified medical data, including structured, semi structured and other unstructured data, represent one aspect making medical data both interesting and challenging. Based on different data structures, the system can efficiently deploy and analyze data online or offline, such as via stream processing, batch processing, iterative processing, and interactive query, therein reducing system complexity and improving development and access efficiency. Environmental sustainability has assumed a large role in the collective conscience of the American public; environmental stewardship is an expected norm for healthcare providers. Corporate social responsibility (CSR) reports and triple bottom line (3BL) reports are standard responses to that consciousness. Many hospitals in existence are nearing the end of their life span and will undergo renovation or replacement. The management of these buildings and properties in a sustainable manner is an obvious next step. Renewable energy, energy conservation, access to mass transportation, recycling, building reuse, and green building design and construction are but a few of the sustainability issues that the healthcare industry can directly impact. Conservation is a viable mission objective that is seen as a positive impact on the planet, people, and profit. When the mission objective includes the patient-centered medical home (PCMH) services model, the management of care is a centrally located, team-oriented continuum of coordinating and tracking care over time, from prenatal and physical fitness to long-term and palliative care. While it is not always practical to construct brand new facilities to house these all-inclusive services, a concerted effort through renovation, reuse, and alliance partnerships can accomplish this robust mission goal.

Community-oriented healthcare

Owners of healthcare property, as well as those who provide services, are looking toward a broader view of healthcare—toward population health. Individual campuses are challenged to define their contribution to the health of the community in which they are located, from micro to macro settings. While hospitals must operate in a positive financial state, economic sustainability speaks to more than a hospital producing a profit. Economic sustainability means, in part, that facilities continue to offer healthcare services to those with inadequate means to pay. With not-for-profit hospitals, that is often part of their central mission, but it should resonate with all healthcare facilities in the community. A primary strategy for healthcare providers maintaining profitability is seeking solutions to preventative care. Healthcare systems also may need to consider a broader strategy of integrated services that specialize in prenatal care, health/fitness promotion, and primary disease prevention. Facilities and services directed at these functions may require collaboration with non-healthcare providers, such as for-profits, not-for-profits, philanthropists, and foundation trustees.

Sustainability through technology

The meaningful use of documentation-related practices, such as electronic health records (EHR), represents a sustainable technological advantage that has the potential to cut costs, make sharing of patient information easier, and decrease medical errors. Technology is also advantageous for monitoring and managing patient health. It can be used to not only treat disease but to also diagnose disease and communicate treatment. For example, wireless communication devices used by key staff in hospitals and remote sites, such as a doctor's office or even a life-flight helicopter, can be essential to providing care outside of any one room, department, or building—in real time. This instant communication exchange decreases overhead costs and enables effective resource management, not to mention it minimizes the fatigue of staff that would otherwise be made to literally run from one crisis to the next.

Social sustainability

Social sustainability refers to the ability or opportunity that each individual has to create or experience a full existence in terms of intellectual, emotional, spiritual, and physical health.

Unquestionably, the focus on social sustainability is at the heart of the human mission of the healthcare industry. While healing patients is the primary outcome of that mission, providing access and teaching opportunities about preventative behavior and wellness are equally important. Part of the PCMH function is to focus on equitable access and quality of access of patients to providers, beginning at the boundary of the region, city, and neighborhood. The health mission is experienced in the physical environment: the path from house to provider that inspires wellness and respite for patients, visitors, clinicians, and administrators. The mission must also inspire clinicians and administrators to become models of nutritional health. Partnership alliances can extend to cafeterias, whole food grocers, farmers markets, or private restaurants. Patient outcomes, wellness, healthy living—these are all components of social sustainability with which healthcare providers should strive to equip themselves, thereby influencing those to whom they provide care. In fact, these components should be the easiest to accomplish since hospitals are full of trained, educated, and experienced personnel with the very expertise needed. The assessment is derived from an electronic survey that allows for benchmarking. Feedback, recommendations, and guidance are provided to enable improvement to practices. Regardless of the adopted method of metrics, provisions must be made for monitoring of all criteria to ensure continual support of the healthcare mission. The cost of healthcare has grown at an unsustainable rate. Financial and legislative pressures have increased to manage and control the economy of healthcare delivery. Who does or does not have access to healthcare, and the quality of the care received, are serious issues to be resolved. The"Greening" of healthcare vies for attention on nearly every healthcare leader's priority list, especially those facing smaller revenues, profitability challenges, and major reforms to healthcare delivery. At the heart of their mission, healthcare leaders must become promoters of sustainability beyond the standard greening factors, where a new frontier of hybrid solutions will meet their health mission. Mission-supported sustainability is one of the central strategies that must be examined. Now is the time to creatively envision a new wave of sustainable approaches for our nation's healthcare environments. Mission-supported sustainability encourages development that connects to the triple bottom line—planet, people, and profits. **HCD.** Preserving the environment is something most health care organizations acknowledge as important, however, many do not have formal programs in place to do so. Viewing sustainability as a "nice-to-have" rather than a top priority can be detrimental not only to a health care organization's surrounding community, but also to its bottom line. There are several reasons why it's essential for health care organizations to shift their thinking to put sustainability front and center in organizational priorities.

Medical Waste Disposal and Other Financial Repercussions

Many communities have strict rules surrounding how waste and recycling are segregated and treated. If health care organizations don't closely follow these rules, they can derail their community's recycling and waste disposal efforts, potentially pollute the environment and incur costly fines. As such, it is critical to instill a comprehensive medical waste disposal program that ensures your staff consistently and correctly segregate all medical, hazardous, sharps and drug waste. The program should include clear processes for addressing different waste streams to make sure they are rendered harmless. Not only is this good for the environment, it can help your organization avoid costly ramifications to its reputation and balance sheet.

Health Care Organizations

Due to their underlying missions, health care organizations have a duty and responsibility to safeguard patients, staff and the community—and a strong sustainability program is a key part of that. Such a program entails reducing the organization's carbon footprint, making sure harmful substances don't get into landfills and water systems and

managing internal operations to conserve resources, such as by employing reusable containers where possible, engaging in robust recycling, developing programs that mitigate the risk of environmental contamination and so on.

Sustainability Strategies

Every day, hospitals, health systems, physician practices and other health care organizations contribute to the billions of pounds of medical and other hazardous waste, much of which can be harmful to the environment if not disposed of properly. If these substances leach into the surrounding landfills and waterways, they can potentially damage ecosystems and cause negative health issues for the community. By developing a sustainability program that ensures waste is correctly collected, segregated, treated and disposed of each and every time, health care organizations can be confident undesirable materials will not make their way into the environment.

Role of Big Data

The 'big' part of big data is indicative of its large volume. In addition to volume, the big data description also includes velocity and variety. Velocity indicates the speed or rate of data collection and making it accessible for further analysis; while, variety remarks on the different types of organized and unorganized data that any firm or system can collect, such as transaction-level data, video, audio, text or log files. These three Vs have become the standard definition of big data. Although, other people have added several other Vs to this definition, the most accepted 4th V remains 'veracity'. The term "*big data*" has become extremely popular across the globe in recent years.

Healthcare as a big-data repository

The health professionals belong to various health sectors like dentistry, medicine, midwifery, nursing, psychology, physiotherapy, and many others. Healthcare is required at several levels depending on the urgency of situation. Professionals serve it as the first point of consultation (for primary care), acute care requiring skilled professionals (secondary care), advanced medical investigation and treatment (tertiary care) and highly uncommon diagnostic or surgical procedures (quaternary care). At all these levels, the health professionals are responsible for different kinds of information such as patient's medical history (diagnosis and prescriptions related data), medical and clinical data (like data from imaging and laboratory examinations), and other private or personal medical data.

Role of artificial intelligence (AI)

Implementation of artificial intelligence (AI) algorithms and novel fusion algorithms would be necessary to make sense from this large amount of data. Indeed, it would be a great feat to achieve automated decision-making by the implementation of machine learning (ML) methods like neural networks and other AI techniques. However, in absence of appropriate software and hardware support, big data can be quite hazy. We need to develop better techniques to handle this 'endless sea' of data and smart web applications for efficient analysis to gain workable insights. With proper storage and analytical tools in hand, the information and insights derived from big data can make the critical social infrastructure components and services (like healthcare, safety or transportation) more aware, interactive and efficient.

CONCLUSIONS

Medical data released and shared through the cloud are very popular in practice, and information and knowledge bases can be enriched and shared through the cloud. The revolution presented by the cloud and big data can have a huge impact on the healthcare industry, and a new healthcare system is evolving. The connection between sustainability and mission must extend to effective management of the healthcare environment, social interaction between patient and healthcare provider, community-based healthcare approaches, and the utilization of current technology. The mission must have measurable goals and objectives that support sustainability, and the ability of the health system to thrive in its ecological, social, and economic environment. This paper has given a literature based study on healthcare systems for sustainable solutions.

ACKNOWLEDGMENT

The author thanks to Dr. S., Sridhar, Ex Vice Chancellor, currently CEO, Sbyte Technologies Chennai, for organizing a cloud-based international conference and allowing her to exhibit understandings of the work.

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