

White Paper

How the Internet of Things (IoT) can Transform the Future of Philippine Hospitals



GoTensei Inc.

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At a Glance: The Healthcare Industry in the Country

The Philippines has a total of 1,822 licensed public and private hospitals ^[1]. Of this number, public hospitals accounted for only 40 percent, while the 60 percent are privately-owned hospitals. Despite this marginal share, public hospitals serve the most number of patients. On the other hand, the private hospitals continue to be one of the vital institutions that provide health care services ^[2].

Hospitals are classified based on ownership as public or private hospitals. The quality of the hospitals in the country varies between rural and urban areas. Both public and private institutions provide quality healthcare but the difference between them are the facilities and technologies offered. However, the technical facilities is not as impressive as the high-end health institutions in other countries like Singapore or US.

On a positive note, some of the country's private hospitals have earned admiration from the international organizations. For instance, the St. Luke's Medical Centers (in Global City and Quezon City) was included as one of the 20 best hospitals worldwide in 2014 and is accredited by the Joint Commission International (JCI), the world's most prestigious accrediting body of healthcare organizations. Also in 2012, the HealthExecNews chose St. Luke's Medical Center as one of the Top 25 Most Beautiful Hospitals in the World. The Manila Doctors Hospital was also acknowledged by the Accreditation Canada International in 2010 and 2016 and is now a reporting member of good standing of the United Nations Global Compact ^[3].

The Department of Health (DOH) has set guidelines in the planning and design of hospitals and other health facilities. Some of the guidelines set by the department include (a) hospital and

other health facilities shall be located where it is readily accessible to the community and reasonably free from undue noise, smoke, dust, foul, odor, etc. (b) shall provide and maintain a safe environment for patients, personnel and public (c) shall ensure the security of person and property within the facility (d) all areas in a hospital and other health facilities shall provide sufficient illumination to promote comfort, healing and recovery of patients and to enable personnel in the performance of work ^[4].

For the proposed 2019 national budget, funds for the public health services may suffer deep budget cuts. The proposed allocation next year for DoH was dropped to P74 billion or lower by P35 billion than its current budget of P109 billion ^[5]. With this budget, what can be done to improve the efficiency of spending in the healthcare industry?

Facing the Reality

The healthcare industry is one of the major part of the economy and consumes significant amount of energy. The escalating cost of water and electricity in the country is one of the challenges in the hospitals to run effectively. If the number of rooms in the hospital increases, the number of utilities, equipment and personnel also increase. This is why there is a need to lessen energy consumption and consequently costs.

What most of us aren't aware of is that the energy consumption entails significant impacts on the environment because of carbon emissions. The healthcare sector whose mission is to prevent and cure disease, is a major contributor to climate change and air pollution – through the natural resources, chemicals and products they consume and through the waste it generates ^[6].

The National Health Service (NHS) in England has calculated its carbon footprint at more than 18 million tons of Co2 each year. While in the United States, the healthcare sector is the single largest

user of chemicals. The Brazilian hospitals use huge amounts of energy which is more than 10% of the country's total commercial energy consumption. The healthcare construction in China is spending more than US\$10 billion a year, and is growing by 20% annually. This consumes significant amounts of natural resources ^[6].

The US Health Sector's

- 341 Trillion BTUs (British Thermal Units) for heat & cooling contributes to even more polluting emission
- Adding to Billions of dollars in health-care bills,
- Hundreds of Billions more in indirect costs to society

The Australia Health Sector's

- contributes to 7% of nation's carbon footprint
- health care sector accounts for 7% of Australia's CO2e emissions (CO2 equivalent refers to a combination of harmful greenhouse gases, not just carbon dioxide), with hospitals and pharmaceuticals making up most of this ^[7].

IoT in Action

The Internet of Things is the next frontier in the healthcare industry and its possibilities are endless. The IoT has been applied to control functions of facilities such as heating, ventilation and air conditioning, security, refrigeration and lighting.

Decades ago, the hospitals were far different from the hospitals we have today. Through IoT, the healthcare systems now depend on connected devices and sensors to enhanced efficiency and workflow, and increased security measures instead of relying on manual and paper works. The IoT doesn't just automate the processes in the hospital but as well as can be a tool to alleviate climate change.

One good example of a hospital who adopted IoT solutions to increase efficiency in different ways is

the Boston Medical Center located in Boston, Massachusetts which they taken up their IoT integration to the next level.

- The newborn babies in the hospital are given wristbands to locate them at any time. In case the newborn was taken too close to an exit door without authorization, the elevators will stop and exit doors will lock remotely.
- The nurses can receive critical alerts on hospital cellphones about their patients' medical conditions which include the heart rate and oxygen changes that the sensors have detected. This will allow them to get their patients more quickly.
- They use wireless sensors in refrigerators to ensure blood samples and medications are kept at the proper temperature. So, there will not be a need for manual monitoring ^[8].

On the other hand, the Hervey Bay Hospital in Queensland, Australia has launched an ambitious program to reduce its health system's climate footprint and have introduced energy efficiency measures at its facilities. The hospital made the cuts by improving its lighting and air conditioning system, and by upgrading its computerized building management system which monitors and controls building functions, including air conditioning, light and water ^[9].

The Meyer Children's Hospital in Florence, Italy has been designed to create a healing environment for patients and landscape alike. To monitor and conserve energy, the hospital has a Building Management System and light tubes that create natural light throughout the building. The hospital consumes 35% less energy for heating and cooling, and 36% less electricity than a standard newly-built Italian hospital ^[9].

The National Health Service in England has created a "Route Map" to make their hospitals green. It is a framework they created to help organizations develop a sustainable health system. One of its six

themes is the Technology in which they would adopt and invest in sustainable and low carbon technologies ^[10].

The Bottom Line: Working Towards Green and Sustainable Hospitals in the PH

There's still a lot of work to do towards the better future of the healthcare industry in the country and to be at par with the hospitals abroad – a need to improve the system, facilities and equipment, innovation on medicine, achieve greater sustainability and efficiency, reduce energy demand, ensure security, waste reduction and reduce its environmental impact. We can achieve this through investing in smarter and healthier facilities, buildings and equipment, and implementing sustainable operations and policies.

Although there is no precise size of the health sectors' global climate footprint, it is still substantial. If providing health care contributes to a heavy carbon footprint, and in return threatens health, we need to make a way how we can reduce the burden. We need to realize that we cannot have healthy people on a sick planet.

The health sector can lead the way in mitigating climate change and at the same time to lower costs in the long run. The public and private health institutions can work hand in hand to employ strategies to limit its climate footprint, one of which is can be through the Internet of Things. We need to explore and optimally adapt and utilize all available technologies, tools and resources to make Philippine Hospitals energy-efficient and climate-smart.

The time is now in revolutionizing the healthcare industry through the Internet of Things. We, at GoTensei is humbled and excited to be a part of this revolution by providing customized IoT solutions and to help organizations eager to realize the benefits of the IoT. Will yours be next?

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