ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY

DEPARTMENT OF SOFTWARE ENGINEERING

Research Methods and Seminar Assignment - I

Seminar on Reaching the SDGs Using Emerging Technologies

Prepared by: Hulunlante Worku ID: FTP0560/11

Submitted to: Dr. Kula Kekeba

December, 2022

Introduction

The **Sustainable Development Goals** (SDGs) are a call for action by all countries to promote prosperity while protecting the planet. Ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

Figure1: The 17 UN SDGs

Nowadays, AI is contributing to the improvement of citizens' quality of life and companies' competitiveness.this document presents how IoT technology works in favour of the SDGs and which projects have been deployed worldwide according to each objective.

In 2018, the analysis of the World Economic Forum [2] reported that 84% of IoT deployments currently address (or have the potential to address) SDGs. IoT can actually make the impossible possible. The United Nations has identified **17 goals for sustainable development** by 2030 and connected devices are set to prove critical to achieving many of these goals. this document present how IoT helps us to achieve 5 of 17 UN SDGs.

Goal #2: Zero Hunger.

Global farming, if left unchecked, will need more land to feed more mouths. Therefore, The UN is calling for sustainable agriculture in an effort to produce higher quality food in larger quantities over the next decade. Smart farming, aided by the power of IoT, is a step towards making this a reality.

Smart farming is expected to produce two major changes in the way food is produced. First, precision farming is expected to bring control and accuracy to farmers by arming them with the most up-to-date information on their cattle or crop. For example, field sensors to record the weather and soil sensors to determine moisture empower farmers to best use their resources.

Second, automation and data. Better-connected farms are likely to allow farmers to do much more with less. New agricultural tools will make farms more efficient and automate the crop or

livestock production cycle, ideally leading to more food at cheaper prices for our ever-growing global populace.

Goal #3: Good health and well-being.

IoT and healthcare are becoming increasingly intertwined. Take, for example, smart watches.That smartwatch has a sensor that is taking in your body's heart rate, sending it to the cloud where it is being analyzed, and then sending that information back to your wrist.

For Example Mine sites are dangerous working environments and most organizations in the industry have a strategic goal of zero harm. Worker fatigue affects the safety of mine operations. Fatigue has many contributing factors and predicting it is difficult. Hence, guidelines are provided to the employees and preventative fatigue management programs are implemented. Available health data, including real-time sensor data in personal protective equipment can be correlated using machine learning to allow for near real-time prediction of fatigue risk.[4]

To take it step further, look at neuron therapy. Doctors are using IoT for real-time analysis of neuron rehabilitation in patients. With access to real-time data, doctors can now create holistic, personalized therapy care programs for any patient regardless of their location[1].the health sector, IoT proposals such as the monitoring of cold chain for vaccines have been implemented[1]

Goal #6: Clean Water and Sanitation

Despite some progress, billions of people still lack access to clean water and sanitation. According to figures from The Water Project, 783 million people – or one in nine people on our planet – do not have access to safe and clean drinking water. Moreover, more than half of the world's population lack safely managed sanitation, and 3 billion people lack basic handwashing facilities at home.

The application of IoT helps to achieve the SDG6 providing reliable objective information about the state of water resources, their use and management, and also about wastewater generation and treatment [5].

Sensors in this way generate very useful insights. Indicators related to water distribution can be obtained near real-time, pressure within pipes can be measured at different locations to reveal leaks, and water quality can be measured continuously. Moreover, sensors show promise in sanitation by linking to appropriate back-end systems to determine when a pit or sanitation tank has reached capacity and needs to be emptied. Fixing and maintaining water systems is vital in securing supply and IoT is showing great promise in this effort.

Goal #7: Affordable and Clean Energy.

While steps are being made to bring affordable and clean energy to all corners of the globe, there is much progress to be made in the 2020s. Roughly 840 million people continue to live without electricity – down from 1 billion in 2016 and 1.2 billion in 2010 – with renewables contributing only 17% to the global energy grid. Wind, solar, hydropower, geothermal power, and biomass energy are growing in the general move away from fossil fuels and connected devices are driving efficiency and automation in this shift.

IoT connects all the elements of power production and consumption, improves visibility in the processes, and provides real control at every step of energy flow. Sensors and connected devices allow companies to access real-time energy data and transmit it to the power grid for advanced storage and analysis. The benefits are two-fold, with connected devices enabling decision-makers to build data-driven optimization strategies and users to understand their energy consumption habits and adjust accordingly.

Automation is particularly important when it comes to generating clean energy. In wind or solar, for example, IoT devices can help detect the most favorable conditions for energy production and automatically change the direction of turbines or panels. Using devices and their data for the monitoring and efficient working of these power generators enables for maximum efficiency to improve power output and reduce operating costs. Not only does IoT enable better operation control in this way, but it also improves safety on the premises.

Goal #9: Industry, Innovation, and Infrastructure.

Smart Farming: farming requires intensive work from farmers. Because of aging farmers and a younger generation avoiding manual work, farming faces a serious problem: a lack of workers. To solve this problem, one can devise a smart farming solution, using GPS, sensors and autonomous tractors.

The promotion of sustainable agriculture reduces poverty (SDG1) and enables sustained, inclusive and sustainable economic growth (SDG8). The application of IoT to agriculture allows resources to be optimized, production costs to lower and crop losses to be avoided [3].

Technologies that help us reach these goals will improve lives for future generations, while providing positive commercial and economic growth in the private sector.

References

[1] Path Website. Investing in Vaccines for the Developing World. Accessed: Dec 12. 2022.

[Online]. Available: https://path.azureedge.net/ media/documents/VAC_investing_fs_2015.pdf

[2] World Economic Forum. Internet of Things: Guidelines for Sustainability. Dec. 12, 2022.

[Online]. Available: http://www3.weforum.org/docs/IoTGuidelinesforSustainability.pdf

[3] Food and Agriculture Organization The possibilities of IoT for Agriculture. Accessed: Dec. 12, 2022. [Online]. Available: http://www.fao.org/e agriculture/news/possibilities-internet-things-iot-agriculture.

[4] Water for a Sustainable world, Report 2015. United Nations Report. Accessed: Dec. 4, 2020.

[Online]. Available: https://unesdoc. unesco.org/ark:/48223/pf0000231823.

[5] K. C. D. F. Meredith whittaker, "AI NOW," New York, Chicago, Google Open research, 2018.