Chapter II

Review of Related Literature and Systems

2.1 Theoretical Background

This section focuses on the review of concepts and systems related to our proposed project. It also presents a review of related local and foreign literature relevant to the study.

2.2.1 Public Address System

Public Address System (PAS) is a voice delivery system using electronic devices, namely a microphone as input, amplifier as a process system, and loudspeakers as output. Public Address System (PAS) functions as a notification of certain information that is heard thoroughly in a building such as airport terminals, offices, train stations, and bus terminals (Lengkong et al. 2019). In general, PA systems are divided into two categories: analog PA system and digital PA system, respectively. Presently, digital PA systems have been widely adopted in many daily public places such as campus, manufacture factory, airport, shopping hall, and intelligent building. Compared to traditional analog PA system, generally, the modern digital PA system can be supported multicast-oriented addressing broadcasting, which can be achieved environmental broadcasting requirement. For example, they may have the lesson test and different topics for different classrooms in the campus, thus the environmental broadcasting will be done different subjects broadcasting without each other interference for the different zones at the same time. In addition, the emergency broadcasting is also major considered functionality for the modern digital PA systems. For example, the Korean government has specially required the enhancement of the Fire services action in 2010, and the buildings must have a PA system facility in case of an emergency ability [2]-[3]. (Kim,2012). adjust the incoming signal to several parts to maximize the circuit path, adjust tone control that has been provided on each input channel (input channel) then sent with the sound output, adjust the incoming electronic signal and give effects to improve sound quality and modify the sound, the incoming signal to the mixer can be separated and duplicated which is then processed by the power amplifier (Wirfs-Brock & Wich, 2020).

2.2.2 Integrated Mobile Based Smart Wireless Public Address System.

This unit consists of a mobile phone and a mobile application. Leveraging on the voice application module, we developed a mobile app that was able to make connections through the wireless module of a smart mobile telephone (Saniie & Gonnot, 2014; Langhammer & Kays, 2012). The voice mobile app was developed for both IOS and Android platform because of their wide application among mobile phone manufacturers. This speaker system was developed from the existing model of regular Bluetooth mini speaker. The Bluetooth module was replaced by a Wi-Fi module and incorporated an energy management unit together with the power supply module. The speaker is also equipped with a proximity sensor to help detect motion (Ruta, Scioscia, Loseto, & Di Sciascio, 2014).

2.2.3 Internet of Things

The combination of information technologies and advanced communication and sensing systems creates a variety of new potential applications. New advanced concepts, such as pervasive or ubiquitous computing (Greenfield, 2006), where computing is made to appear everywhere and anywhere, hold a huge potential for application in smart grid (Parikh et al., 2010). Smart grid is a concept that integrates information and communication technologies (ICT) with grid power systems, in order to achieve efficient and intelligent energy generation and consumption (Iyer and Agrawal, 2010). According to Gubbi et al. (2013), IoT is an “interconnection of sensing and actuating devices providing the ability to share information across platforms through a unified framework, developing a common operating picture for enabling innovative applications. This is achieved by seamless ubiquitous sensing, data analytics and information representation with Cloud computing as the unifying framework.” Therefore, the Internet of Things aims to improve one's comfort and efficiency, by enabling cooperation among smart objects.

2.2.4 Cloud Data Integration for Real-Time Management

Cloud Data Integration for Real-Time Management Cloud-based solution will bring a more centralized storage for access data, which be able to enable real-time tracking and reporting. By storing data on cloud servers, these systems allow easy scalability, with benefits including remote access and improved data management (Zhang & Lee, 2021). This composition will be crucial for real-time updates and can fundamentally reduce the troubles of managing data manually.

[5] Daniel Merkuri Lengkong, Muhammad Wildan, and Toni, “Rancang Bangun Integrasi Aplikasi Public Address System Text To Speech Dan Flight Information Display System Berbasis Wireless Guna Meningkatkan Kualitas Pelayanan Jasa Informasi Di Bandar Udara Halim Perdana Kusuma,” Jurnal Ilmiah Aviasi Langit Biru, vol. 12. No. 1 pp. 39-44, February 2019.

[2] J.-S. Kim, “Development of the digital public address system,” Proceedings of the 2012 IEEE International Conference on Computing Technology and Information Management (ICCM’12), vol. 2, pp. 638 632, 2012.

[9] Wirfs-Brock, Allen, and Brendan Wich, “JavaScript: The First 20 Years,” Proceedings of the ACM on Programming Languages, vol. 4, no. HOPL pp. 77-189, June 2020.

[3] Jafar Saniie Thomas Gonnot. User defined interactions between devices on a 6lowpan network for home automation (2014). Technology Management Conference (ITMC), 2014 IEEE International, (1-4).

[4] Langhammer, N.; Kays, R. (2012). Performance Evaluation of Wireless Home Automation Networks in Indoor Scenarios. Smart Grid, IEEE Transactions on, Vol.3, 2252- 2261.

[5] Weiping Sun, Munhwan Choi and Sunghyun Choi (2013). IEEE 802.11ah: A Long Range 802.11 WLAN at Sub 1 GHz. Journal of ICT Standardization, Vol. 1, 83–108, 125. [6] Michele Ruta, Floriano Scioscia, Giuseppe Loseto, Eugenio Di Sciascio (2014). KNX, a worldwide standard protocol for home and building automation: state of the art and perspectives. Industrial Communication Technology Handbook, CRC Press/Taylor & Francis, page 1463-1481