

*How Wireless Communication Technology Connecting Muslim Society in Indonesia
During COVID-19 Pandemic*

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Abstract

The aim of this study is to learn how the transformation of wired to wireless communication technology has connected the muslim society in Indonesia. During COVID-19 pandemic, the government banned or restricted the ‘mudik’ event, a yearly cultural tradition where muslim citizens travel back to their hometowns (exodus) to visit their parents and families. With the restriction in place, muslim citizens need to find a way to stay connected with their hometowns—and one of the ways is through wireless communication technology. In this paper we will learn how wireless communication technology helps muslim society stay connected amidst the COVID-19 pandemic, by understanding the wire and wireless communication from the concept and context of communication, technology, and society.

Keywords: Wireless, Wireless Communication, Communication Technology, Muslim Society

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1. Introduction

Lebaran or Idul Fitri is a monumental event for muslim society in Indonesia; celebrated after a full month of fasting in the Holy Month of Ramadan. According to the Indonesia Statistics Center (Badan Pusat Statistik) from the population census conducted in 2010, there are 207.2 million muslims in Indonesia, making up the majority 87.2% of the overall population. During Lebaran, muslims in Indonesia conducted what is called 'mudik' event; a cultural tradition unique to Indonesia where the majority of muslim citizens travel back to their hometowns to visit their parents and families.

In the span of 2020 to 2022, there are restrictions of this mudik due to COVID-19 pandemic in Indonesia. Worldometer.com recorded a surge of COVID-19 cases in Indonesia from around 100,000 cases in January 2021, to a tremendous 500,000 cases in July 2021—resulting in a big jump of total deaths from 50,000 to 100,000 people from January to August 2021. The government decided to ban or restrict the mudik movement in order to prevent the COVID-19 from spreading.

The mudik restriction regulation greatly impacted the muslim citizen society. Cabinet Secretariat of The Republic of Indonesia issues a Circular Letter 13 of 2021 (Surat Edaran Nomor 13 Tahun 2021) regarding the ban of the Eid Day tradition of mudik (exodus) in 1442 Islamic Calendar of Hijri (in the year 2021) and efforts to control the spread of COVID-19 during the Holy Month of Ramadan 1442 Islamic Calendar of Hijri (in the year 2021)—valid from 6 to 17 May 2021. Fortunately, as a developing country, the adolescence of the Internet in Indonesia allows it to become a major medium that can arbitrate the situation through wireless communication technology.

2. Literature Review

2.1. Wired Communication

"Wired communications" is the term used to describe any communication process that uses cables and wiring directly to transfer or transport data, including audio and video. The best example is the traditional home phone, which is wired from the house to the neighborhood phone switch, to the ethernet cable that allows computer systems to access the internet (Ibrahim et al., 2017:20). With technological advancement, cables not just functioned to transfer audio and visual data, but also the internet.

Fiber optics is a new media that allows for high-speed transmission of data, sound, and video in accordance with a transmission sequence. Fiber optics are quickly taking over as the preferred transmission medium for modern communications. They are essential in facilitating the increasing use of the Internet, and have been instrumental in enabling the remarkable expansion of global communications over the past 25 years (Rezgui, 2021:20). Compared to older copper cable used in previous generations, fiber optics can handle significantly more signals while preserving signal integrity over longer distances (Ibrahim et al., 2017:20). The fiber optics cables are installed underground and beneath the ocean to connect information between continents.

Development of underwater fiber optics cables depended on the unique ability of pure glass fibers to transmit light by internal reflection, which was concentrated in the late 1970s and early 1980s. Data might travel fast throughout the globe by being encoded as light pulses. In

order to protect them from harm from other seabed users, cables that span the continental shelf (usually 0–130 m deep) to a depth range of 1,000–1,500 m are frequently buried below the surface (Huynh, 2010:8-23). While research claims that wired technology is more stable, it does not offer flexibility as users must rely on the physical infrastructures.

2.2. Wireless Communications

While wired communication involves cables or physical medium, “wireless technology” uses radio frequency (RF), microwave, infrared or other types of acoustic or electromagnetic waves without the use of wires, cables, or optical fibers to transmit data or signals over a short or long distance (Gupta, 2012:1, Ibrahim et al., 2017:20). The most prominent example is the wireless mobile networks that were currently utilized in mobile smartphones.

The evolution of wireless mobile networks is symbolized by “G” that stands for Generation: 1G, 2G, 3G, 4G, and 5G respectively. 1G was first developed in Japan during 1980 to provide calling services with speed access of a tiny 2.4 Kbps. 2G was first introduced in 1992 by replacing Analog with Digital allows the network to send SMS messages with data transmission speed increased to 64 Kbps. 3G, which was commercialized in 2003, is popular as a ‘data revolution’ due to its remarkable achievement. With a network data rate of 144 Kbps up to 2 Mbps for mobile users; 3G network makes it easier to send and receive large emails, chat online and watch videos without interruption. After 10 years of 3G network stability, 4G is introduced in 2013 and quickly became popular due to it’s extremely fast access speed that can reach 1.2 Gbps (20 times higher than 3G), improving 3G aspects like downloading large and heavy files, streaming high-quality videos, while opening up the possibility of new and improved services like video conferencing, mobile payments, cloud-based gaming and visualizations. 5G is the latest and most recent mobile network technology launched in 2020 that allows a strong and speedy access to the internet while improving modern society when applied to virtual reality technologies and self-driving cars (Lan, 2023:68-71). Satellite is one of the mediums that makes wireless communication and mobile network possible.

Satellite in communication refers to the medium, in the form of objects traveling in outer Earth orbit, that functions to transmit data to the terrestrial antenna, allowing information to be shared between senders and receivers across distances (Misra et al., 2013:1681-1682). [see Figure 1]

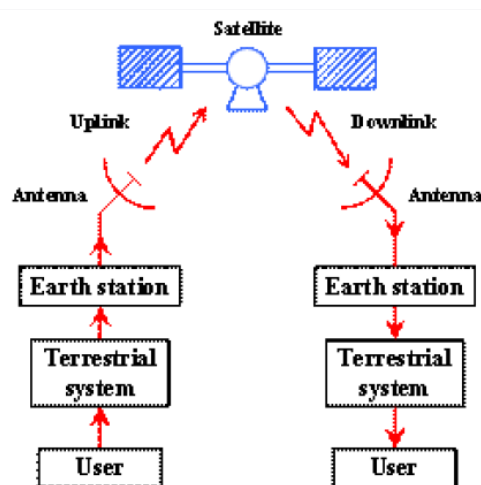


Figure 1: Satellite Communication Overview

It opens a plethora of possibilities in communication technology, including one that can share each other's location via the satellite that was popular to be known as Global Positioning System (GPS). With the advancement of wireless communication technology, mobile networks, and the satellite, the Internet of Things (IoT) era is revealed.

While satellite allows signal transmission across distances, there are some areas that may hamper the signals like in mountainous, high density forestry rural areas. Google Inc's Project LOON (Darokar & Astonkar, 2017:659-662) initiated to mitigate those issues by using floating balloon networks in the stratosphere, connected to the land-based Internet Service Provider (ISP). While there are challenges like high investment, maintenance cost, and specific engineering skill requirements that makes the future of this project remain uncertain, the vision is right to be appreciated as Google aims to provide education, medical assistance to the rural areas.

2.3. Internet of Things (IoT)

Villamil et al. (2020:2320) define Internet of Things (IoT) as "A system that performs various types of functions, such as services involved in device modeling, device control, data publishing, data analysis, and device detection.". The Internet of Things aims to connect objects at any time, anywhere, with anything, and with everyone, preferably via any path, network, and service (Patel & Patel, 2016:6122). One prominent example in communication is in phone calls, that are now can be conducted via the internet without physical material like cables or wires.

Voice Over Internet Protocol (VoIP) is one example of the IoT that evolved the telecommunication world. VoIP allows phone calls to be conducted via the internet, defined as a multimedia session involving several participants, established by a signaling protocol that empower each network component to communicate with each other (Jalendry & Verma, 2015:161). An example of this technology is WhatsApp call where people can place phone calls as long as they are connected with the internet.

3. Analysis

Due to the increasing positive case of COVID-19 in Indonesia from mid 2020, the government imposes the regulation to restrict Lebaran mudik from 6 to 12 May 2021 [see Figure 2]. From the data released by Indonesiabaik.com, from a total of 207.2 million muslim society in Indonesia, the mudik trend is decreasing year-to-year from 18.3 million in 2019, 297.000 in 2020, and 1.5 million people in 2021. From muslim society's perspective, it's been 2 years since they cannot visit their hometowns.



Figure 2: Public Social Announcement for Mudik Restriction 2021

During this dire and uncertain period, muslim society utilized the power of telecommunication technology, especially the wireless communication technology to stay connected with their kin. SindoNews.com recorded top 5 applications that can be used to replace the mudik through video conferencing: Zoom, Google Meet, WhatsApp, Skype, and Cisco Webex. The major challenge was in the cost, and the stability and reliability of the connection.

Wi-Fi is mainly used by the muslim citizens. Wi-Fi (Yinan et al., 2012:1293) is a wireless network made up of access points and wireless network adapters. The term "access point," or "network bridge," refers to the device that acts as a link between wireless and conventional wired local networks. The client device responsible for receiving transmit signals from the access point (AP) is the wireless network adapter. Unlike in the city, some hometowns might still be outside of Wi-Fi connection coverage and must rely on more traditional mobile network connections.

3G and 4G devices are common in the suburban areas of Indonesia, where the hometowns are mostly located. OpenSignal.com conducts research to see what internet providers are reliable in providing smooth video conferencing [see Figure 3] with Telkomsel being the winner (62.4 points), followed by Indosat (58.9 points), XL (58.7 points), 3 (58.0 points), and Smartfren in the bottom (48.8 points). While the wireless communication technology cannot replace the physical interaction of the muslim society, it can be the alternative interaction that they can use during the restriction period.

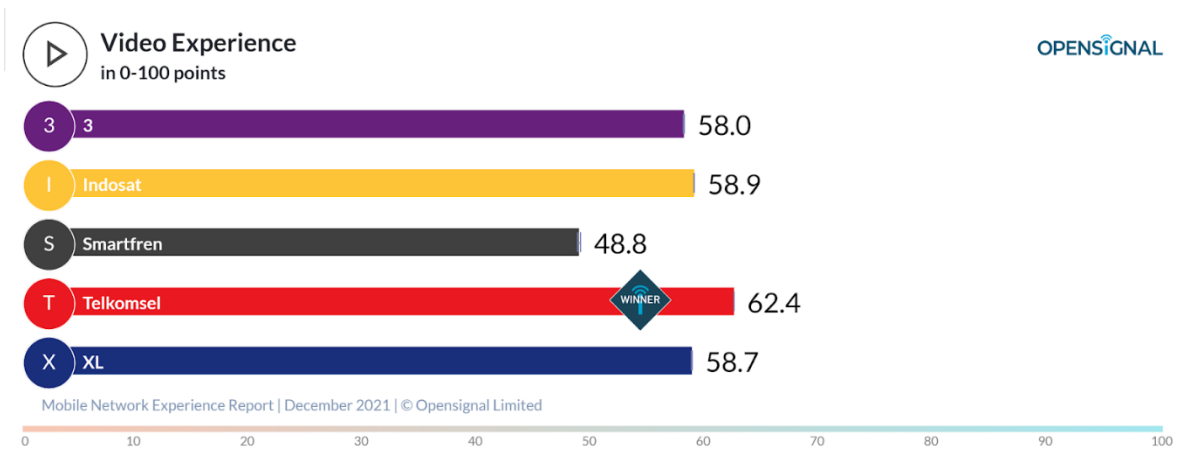


Figure 3: OpenSignal.com Video Experience Survey December 2021

4. Conclusion

In this paper we can see that the development of the internet and wireless communication technology has made muslim society feel the same Lebaran joy and tradition without being physically connected. In 2022 the mudik restriction was revoked, at the same time there is a 57 times increase in the mudik traffic compared to 2021 or around a whopping 85.5 million people (BigData.BPS.go.id). It proves that although communication technology can act as a temporary alternative, it cannot fully replace the sense of physical meeting, face-to-face conversations, and warmth.

The recommendation from this paper is for Indonesia mobile networks and internet providers to increase the coverage not only in big cities, but also suburbs and rural areas where the mudik hometowns are located. Also the availability of affordable 4G mobile devices will help. This way, Indonesia with the largest muslim population in the world, can still maintain communication and interaction in case another mudik restriction would take place.

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