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Correlation of Terrestrial Satellite Computation and Allocation of Influence in The Development of Digital Television Services in Indonesia

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Abstract

Analog television in Indonesia is currently being transformed into digital television. The purpose of this study was to determine the effectiveness and impact of the transformation of these changes. The total population of the study was unknown, so convenience sampling was used. The data obtained is processed descriptively. The results show that all respondents who earn below one million rupiah per month do not receive government assistance to convert their televisions into digital televisions, and respondents do not have knowledge about how to convert analog televisions into digital televisions.

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INTRODUCTION

The rapid development of technology in the 21st century makes it easy for all aspects of life. The renewable technology initiated by the Alibaba Group predicts the leading technological trend that will play a role in shaping the technology industry in the coming year, namely terrestrial computing networks which provide digital services to densely populated communities (Nusraningrum, 2021). The use of digitization is applied to digital television channels which are computed with satellite-terrestrial which provides connectivity everywhere. This makes the transformation change from analog television to digital television because the analog type is considered obsolete. In addition, the existence of digital television is intended to save the use of radio frequency spectrum, and global trends show that more than 85% of the area in the world has been covered by digital television broadcasts.

Starting in early 2012, Indonesia through Minister of Communication and Informatics Regulation No. 05 of 2012, adopted the digital terrestrial television broadcasting standard Digital Video Broadcasting - Terrestrial second generation (DVB-T2) which is a development of the DVB-T digital standard previously set in 2007. In this case, the government is trying to adapt to technological developments that so rapidly and see it as an opportunity for the development of the national

broadcasting industry in the future. Before establishing these digital standards, the government first conducts studies and public consultations involving relevant stakeholders.

Analog television broadcasts that have been broadcasting for almost 60 years in Indonesia will be replaced by digital television broadcasts in 2022. Digital television broadcasts using digital signal modulation and compression systems will provide cleaner picture quality, clearer sound and sophisticated technology for the Indonesian people (http://siarandigital.kominfo.go.id, 2023; Sadewo, 2022).

The government, in this case the Ministry of Communication and Informatics, assesses that migration from analog to digital based on analog policies and technology will be more expensive to operate and will gradually become obsolete. This policy is also intended to save the use of radio frequency spectrum, and global trends show that more than 85% of the world's territory has been covered by digital television broadcasts. The government assesses the philosophy of migrating to digital, namely obtaining digital dividends (the remaining radio frequency spectrum after the analog switch off). In addition, it is also intended to create broadcasting industry efficiency because in practice it uses the application of multiplexing broadcasting and maintains business continuity from existing private broadcasting institutions Sadewo, 2022).

METHOD

Research design

This research is a qualitative descriptive study. The survey was conducted to find out the description of the implementation of digital television in the community in Jakarta, followed by the provision of digital television transformation guide training. After the training, participants' understanding of the benefits of digital television was measured compared to analog television. To achieve the research objectives, the research will be carried out with the assistance of research participants to be involved during the data collection process by applying a transformation to the use of digital television with a comparison to the use of analog television.

Research Stages and Achievement Indicators

Table 1. Research Stages and Achievement Indicators

Research Stages	Targets and Achievement Indicators
Study I: An overview survey of the implementation of digital television in the community in Jakarta.	Obtained data regarding the description of the implementation of digital television in the community in Jakarta.
Processing Study I data.	An overview of the application of digital television to the people in Jakarta is obtained.
Training on the use of digital television and education on the benefits of digital television compared to analog television.	Obtained data. Subjects can understand the principles of using digital television and education on the benefits of digital television compared to analog television.

Collect data related to changes in differences that arise during the implementation of the use of digital television on participants compared to the use of analog television.	Obtained data after the provision of training and data on differences in usage between digital television and analog television.
Data analysis and conclusion.	Findings were obtained regarding the effectiveness of using digital television.
Preparation of research reports.	The output of the research is the MBKM Research report, and the publication of scientific articles in the Scientific Journal of Mercu Buana University.

Population and Sampling Techniques

The population of this study is unknown, so the sample used is 26 affordable respondents in five areas of DKI Jakarta.

RESULTS AND DISCUSSION

Respondent Descriptive

Respondents in this study were residents in the DKI Jakarta area. The number of respondents used as samples in this study were 26 respondents. Based on the results of the questionnaire that was distributed to the respondents, the characteristics of the respondents were known as shown in the table below.

Table 2. Description of Respondents

	Characteristics	Total	Percentage
Gender	Man	11	42.3%
	Women	15	57.7%
	Total	**26**	**100%**
Age	< 20 Years	11	42.3%
	21 - 30 Years	9	34.6%
	31 - 40 Years	1	3.8%
	>41 Years	5	19.2%
	Total	**26**	**100%**
Domicile	North Jakarta	2	7.7%
	West Jakarta	12	46.2%
	Central Jakarta	2	7.7%
	East Jakarta	4	15.4%
	South Jakarta	6	23.1%
	Total	**26**	**100%**
Marital Status	Married	8	30.8%
	Single	18	69.2%
	Total	**26**	**100%**
Family Income	< 1.000.000	13	20%
	1.000.000 - 2.000.000	-	-
	2.000.001 - 3.000.000	3	11.5%
	3.000.001 - 4.000.000	2	7.7%
	≥ 5.000.000	8	30.8%
	Total	**26**	**100%**
Number of TVs in the House	1	13	50%
	2	7	26.9%
	3	3	11.5%
	4	1	3.8%
	≥ 5	2	7.7%
	Total	**26**	**100%**

Based on the table above, the majority of the 26 respondents in this study were women with a total of 15 respondents (57%), with an age range of less than 20 years or more with a total of 11 respondents (42.3%). Furthermore, domiciles were dominated by respondents who living in West Jakarta as many as 12 respondents (46.2%) with marital status dominated by unmarried respondents as many as 18 respondents (69.2%). For income as many as 13 respondents (50%) have an income of less than Rp. 1,000,000 rupiahs. And for the number of TVs owned at home, as many as 13 respondents (50%) have 1 TV at home.

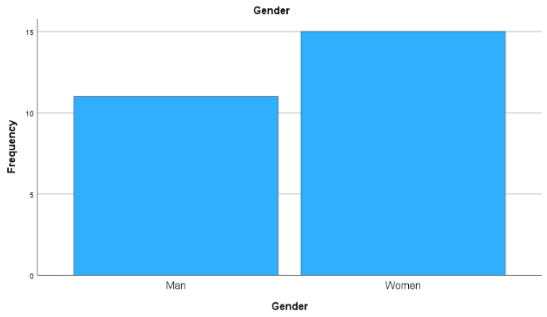


Figure 1. Gender of Respondents

Figure 1 shows the respondents are dominated by women.

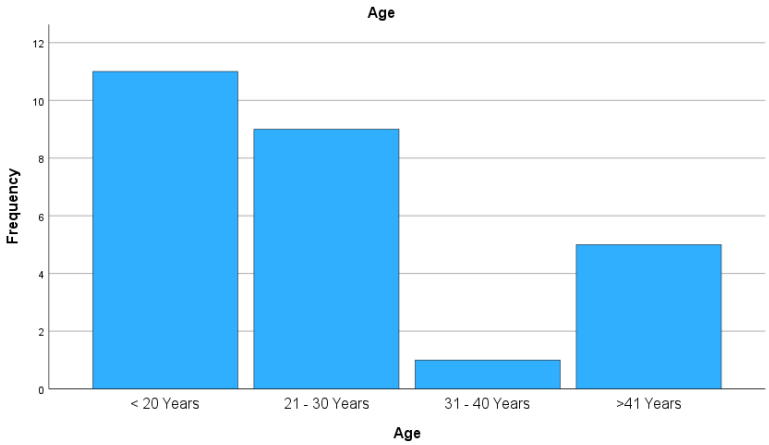


Figure 2. Age of Respondents

Figure 2 shows the majority of respondents are under 20 years old.

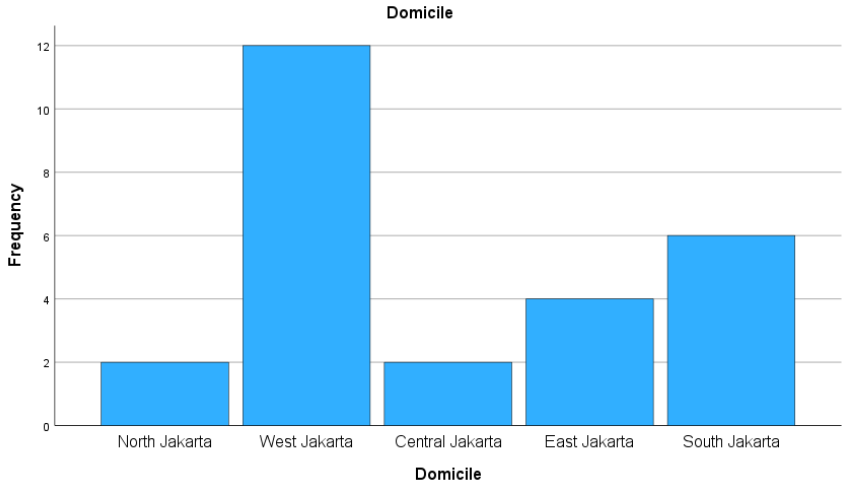


Figure 3. Respondent's Domicile

Figure 3 shows that the majority of respondents live in the West Jakarta area.

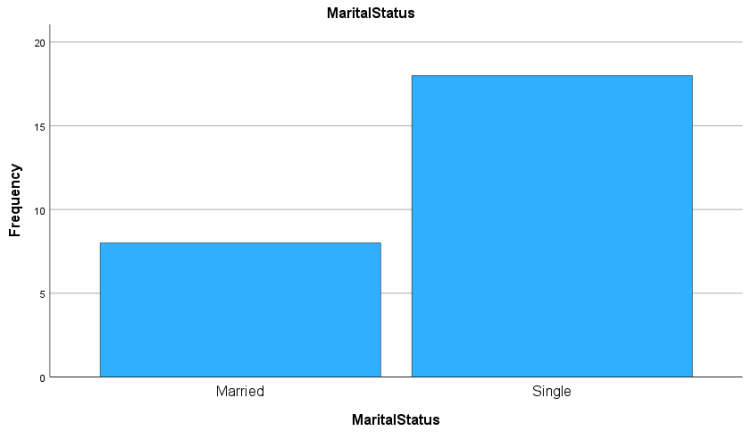


Figure 4. Respondents' Marital Status

Figure 4 shows the majority of respondents are not married.

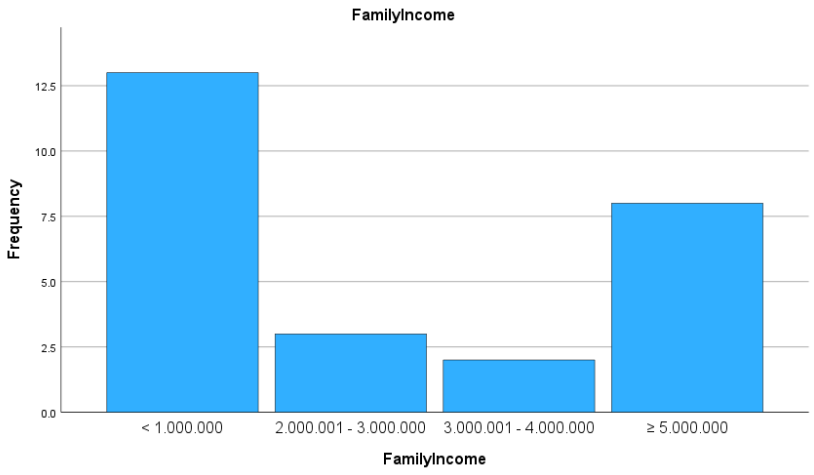


Figure 5. Respondents' Income

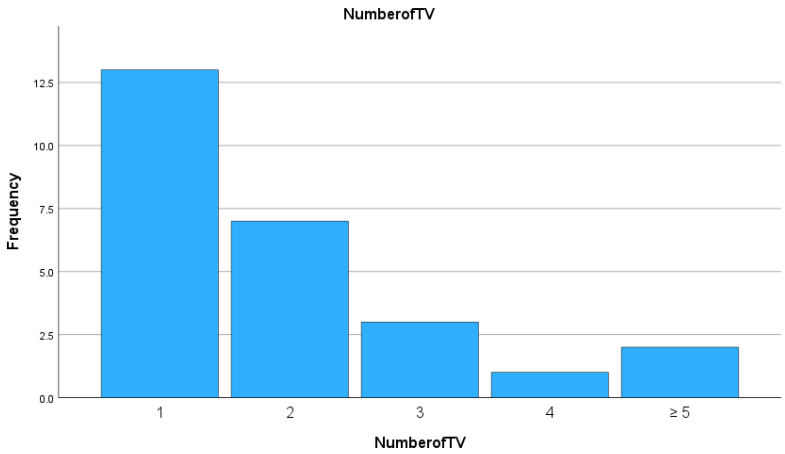


Figure 7. Number of TV owned by respondents

Discussion

The first question asked to research participants was "What do you know about the difference between Analog TV and Digital TV?".

No.	Respondents Answer
1.	Analog TV uses a network or external antenna signal, the picture and sound may depend on signal conditions. Digital TV uses a more stable signal technology so that the picture and sound are clear and clear.
2.	Broadcast network.
3.	Analog TV, analog signals and large forms such as boxes Digital TV, digital antenna signal and a slim shape like an LED
4.	Digital doesn't use an antenna.
5.	Analog TV itself uses cathode ray tubes, this of course makes analog TV look much bigger and will take up a lot of space in the room. Digital TV itself uses a flat panel screen starting from several devices such as LCD, Plasma and LED.
6.	Signal capture & clearer images.
7.	Digital TV no longer uses an antenna.
8.	Analog TV signal reception is limited. Digital TV processes directly from a well-earned signal.
9.	Digital TV has clearer picture quality, while analog TV still tends to get crunchy when it rains.
10.	Digital TV uses a satellite dish while analog uses an antenna.
11.	The picture is clearer.
12.	The quality provided by digital TV is better.
13.	Analog TV is not clear in the picture, if digital TV is clear and has lots of channels, so digital TV is now very popular with people.
14.	Analog TV uses an antenna and signal quality and image clarity are greatly affected by the distance to the TV Station, while Digital TV uses a set top box and antenna which makes the picture quality better.
15.	Analog TV still uses cable, antenna, etc. Digital TV uses internet technology and can also be viewed via cellphone.
16.	Analog TV is TV that uses an antenna, digital TV is TV that uses the internet.
17.	Analog TV is TV that uses an antenna and is limited in broadcasts. Digital TV is TV that uses internet technology and various channels.
18.	Analog TV prefers to be damaged and can't get a signal, while digital is clearer and better.
19.	TV analog old model, TV digital new model.
20.	Analog TV only relies on antenna devices and the results are not very good, while digital TV already uses a set of boxes or a filter device to clarify broadcasts so the picture automatically

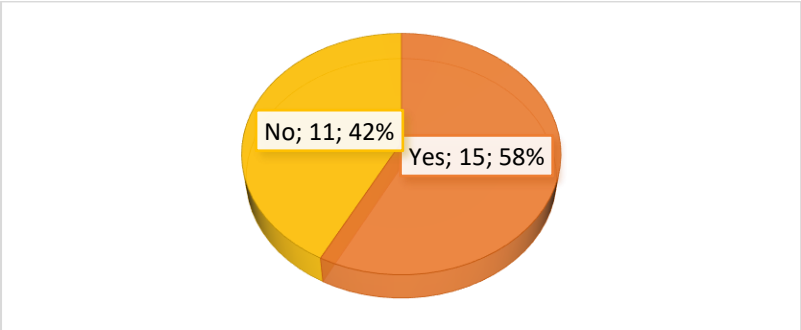
gets better.

21. Analog TV tends to be more old-fashioned in physical form, with limited channels, whereas digital TV is more modern and limitless.
22. The number of frequencies in one channel.
23. Digital TV screen display is clearer than analog TV.
24. Digital TV provides clearer and sharper images than analog TV.
25. If analog TV uses cathode rays while digital TV uses panel screens.
26. Analog TV uses old technology designed for sound, while Digital TV is for voice and data transmission.

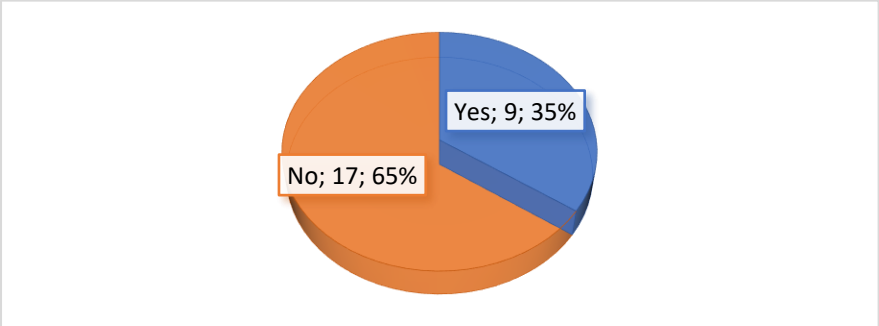
Source: processed data, 2023

The following questions asked are:

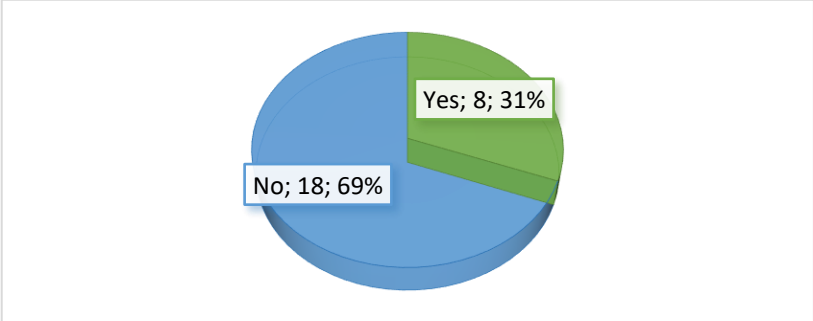
Does the TV in your house still use an antenna? The results show that 15 people or 58% are still using the antenna.



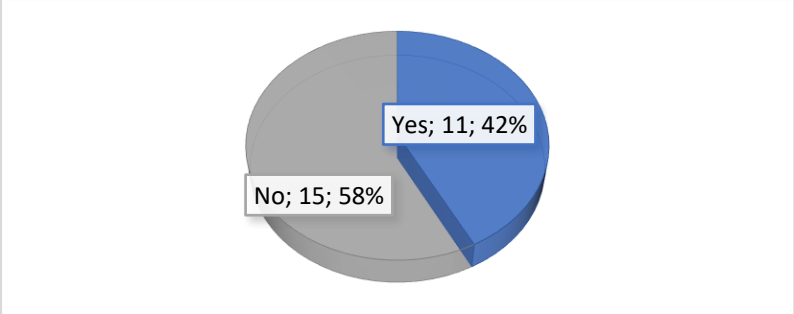
Do you experience difficulties with the Government's policy regarding the implementation of Digital TV in Indonesia? The results showed that 35% said they were disturbed.



Do you need special training for using Digital TV? The results show that 31% need training in using digital TV.



Are you willing to attend via the Zoom room on January 27, 2022, at 09:00 WIB to take part in the Analog TV to Digital TV Operation Training? 42% of respondents are willing to attend.



From the survey conducted above, it was found that women who are not married and have an income of under one million rupiah per month in the DKI Jakarta area have limited knowledge about digital television, so a more detailed explanation is needed on how to change the television they own to digital television. The government has distributed special tools to change analog television to digital television or Analog Switch Off (ASO) to less fortunate families. The tools distributed, called set top boxes, amounted to 6.7 million set top boxes distributed free of charge to poor families. It was found that the respondents to this low-income study had not yet received the intended Government assistance (Antaranews.com, 2022).

Respondents who were willing to be given guidance on operating digital television were then contacted one by one to be able to attend the training via Zoom.

Figure 8. Digital TV Operation Training

Source: authors, 2023

After the training, questions were asked about giving government assistance, which turned out to be 80% of respondents said that they had not received government assistance. As promised by the Ministry of Communication and Informatics has prepared a set top box (STB) device to be distributed free of charge to the poor. At least 6.7 million poor families will receive equipment subsidies to watch digital TV broadcasts (https://www.kominfo.go.id/, 2022).

When respondents were asked about their understanding of knowledge and skills regarding the operation of digital television after online training, 90% said they understood, while the remaining 4% did not understand.

The use of technology is unavoidable and becomes part of modern life, even though people do not yet have the skills to use technology adequately (Putri et al., 2020; Nusraningrum et al., 2019). The use of modern technology and equipment can increase interaction, help them to transfer knowledge more effectively, and easily, conveniently, and quickly (Nusraningrum et al., 2022; Raja & Nagasubramani, 2020). European and Middle Eastern countries have been done with digitizing television since a decade ago. Japan completed it in 2017, South Korea in 2012. Neighboring countries such as Malaysia and Singapore have completed the Analog Switch-Off (ASO) in 2019, followed by Thailand in 2020, and Vietnam in 2021. So that the Indonesian people need to get services better television by utilizing the latest technology.

Industry 4.0 is marked by everything related to the internet (Nusraningrum et al., 2021), information becomes more transparent which is used in decision making, and automation is carried out by machines to deal with environmental and financial impacts (Nusraningrum, 2021; Carli & Dotoli, 2017). The radio frequency spectrum used for analog TV is in the 700 MHz band which is the ideal frequency spectrum used for internet services. Therefore, the whole world is implementing digital TV technology to conserve the use of the 700 MHz band so that part of it can be used for internet services such as 4G, 5G, and subsequent technological developments. In Indonesia, the savings from the 700 MHz band will also be used for disaster early warning systems, remote education and health services.

CONCLUSION

The government's policy to change analog television to digital is part of the inevitable development of the era, however, the readiness of television digitalization infrastructure still requires preparation and effort from both a financial and non-financial perspective. This research was conducted on respondents whose income was mostly below one million rupiah per month and it was found that the transformation of television from analog to digital could not be said to be effective at the time this research was conducted. The use of Digital TV needs to be done for; improving terrestrial television broadcasting services, catching up with Indonesia in digitalizing terrestrial TV systems compared to other countries, Analog TV is not efficient because it uses a lot of 700 MHz frequency spectrum, if migrating to Digital TV, Indonesia has a remaining frequency/digital dividend of 112 MHz, broadcast distribution quality television in all corners of the country, creating new job opportunities, and free terrestrial TV with cleaner picture quality, clearer sound and a greater number of broadcast programs.

This research has limited research time, knowledge and abilities of researchers who were still in semester 3 when this research was conducted. For this reason, suggestions for improvement are needed by researchers.

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