Exploring the Predictors of Consumers’ Purchase Intention of Terrestrial Digital Decoder

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Abstract. Indonesia is one of the countries that currently struggle to switch terrestrial television from analog to digital. The Indonesian government has distributed terrestrial digital decoders in several trial areas so that the recipients can experience the terrestrial digital broadcasts on their old analog television. The distribution of the decoder is expected to encourage recipients to convert to digital completely. Once the decoder cannot be used anymore, the recipients can choose either to purchase integrated digital television (DTV) or a new decoder to keep experiencing the terrestrial digital broadcasts. This study focuses on the consumers' intention to buy a new decoder based on respondents' demographics, television media consumption, pay television subscription, the availability of public, private, and cross-border television signals, and the perception against digital terrestrial-related factors. Primary data was collected through a survey in several free decoder distribution locations, while the samples consist of the decoders' recipients. This study uses binary logistic regression as the analysis method. The results indicate that the intention to buy a decoder is influenced by geographical location, the subscription to both cable-based and satellite-based television, TV-viewing duration, the satisfaction with the quality of digital terrestrial television, and the satisfaction with the decoder they have received.

1. Introduction
It has been more than a decade since the Indonesian government had initiated the migration plan of terrestrial television from analog to digital. There are several reasons for this plan. First, digital technology enables more efficient use of the spectrum. Thus, the migration is expected to free up a portion of the spectrum currently occupied by traditional television. Particularly for the case of Indonesia, the complete migration will free up 112 MHz of spectrum that can be used either to increase the number of television channels or to be re-allocated to other more valuable services, such as mobile broadband. Second, television digitization promises a cost-effective broadcasting operation and creates new business opportunities for content creators, manufacturers of digital television and decoder, and producers of network infrastructure. Third, from the audience's viewpoint, digital television offers improved picture and sound quality, more varied programs, interactivity, and flexibility of reception [1–4].

Initially, the Indonesian government targeted the termination of the analog signal by the end of 2017[5] and full switch to digital by 2018. Unfortunately, there were several challenges during the preparation of migration, including the cancellation of several ministerial regulations on implementing...
digital terrestrial television (DTT). These cancellations led to the unavailability of legal protection for terrestrial television digitization. However, it did not deter several DTT trials in several areas. The government also continues educating people concerning DTT and distributing free terrestrial digital decoders in the trial areas. The distribution of the decoder is expected to be a stimulant for recipients to convert to digital completely. The recipients can use the decoder to experience the trial on their old analog television.

Against the background, in addition to preparing legal protection for DTT implementation, it is critical to ensure that the recipients sustainably convert to terrestrial digital television without relying solely on the decoder provided by the government. The government has to encourage them to purchase a new terrestrial digital decoder, particularly when the free decoder is broken or cannot be utilized anymore. However, it isn't easy to define an appropriate policy without understanding the factors that likely affect the recipients' decision to purchase the equipment. Therefore, this study seeks to investigate the intention to purchase a new decoder based on respondents' demographics, television media consumption, the availability of terrestrial television signals, and the perception against digital terrestrial-related factors.

The remainder of this paper consists of the research method in Section II, results and discussion in Section III, and the conclusion in Section IV.

2. Research Method
This present study obtains data from a survey administered by Badan Aksesibilitas Telekomunikasi dan Informasi (BAKTI). The survey was carried out in 2018 and included nine survey locations, namely Sanggau, Bengkayang, Ternate, Lombok Timur, Belu, Bengkalis, Wakatobi, Padang, and Tarakan. To measure the intention to purchase a new decoder equipment, the survey asked respondents' interest to spend their money on the equipment once the free decoder they received is broken or cannot be utilized anymore. The questionnaire includes categorical options to choose ranged from not interested to very interested. Meanwhile, explanatory variables comprise demographics, television consumption, the availability of terrestrial television signals, and the perception against DTT-related factors. All independent variables are categorical variables.

The dependent variable is categorical with more than two values and with a possibility to sort the values in a certain order. In such a situation, ordinal logistic regression is more appropriate to use [6]. Ordinal logistic regression is an extension of the binary or dichotomous logistic regression. It is a non-parametric analysis mostly used to assess the association between a categorical dependent variable and one or more numeric or categorical predictors[7]. Tansey et al [8] support this view that logistic regression is the best choice to use when dealing with ordinal and non-ordinal data sets. This kind of regression also does not require a normal distribution of data [9]. Many previous works have employed logistic regression to predict the respondents' intention to adopt an innovation. For instance, a study by Ariansyah [10] investigated the association between personal innovativeness, social influence, ease of use, usefulness, and the price against the intention of urban society in Indonesia to adopt IoT applications. Another study by Koksal [11] has explored the factors influencing the intention to utilize mobile banking. In addition, Alawadhi and Morris [12] and Serener [13] used logistic regression to assess the intention against e-government services and internet banking, respectively.

3. Results and discussion
3.1. Samples profile
There are 465 respondents participated in the survey. Nevertheless, only 418 responses are considered valid and meet the criteria of this present study. Hence, 47 answers are excluded from further analysis. Table 1 displays the profile of valid responses.
Table 1. respondents’ profile

|                | n  | %     |
|----------------|----|-------|
| **Gender**     |    |       |
| Male           | 256| 61.2% |
| Female         | 162| 38.8% |
| **Age**        |    |       |
| <26 years old  | 19 | 4.5%  |
| 26-35 years old| 78 | 18.7% |
| 36-45 years old| 115| 27.5% |
| 46-55 years old| 118| 28.2% |
| 56-65 years old| 61 | 14.6% |
| >65 years old  | 27 | 6.5%  |
| **Educational attainment** |    |       |
| No school      | 99 | 23.7% |
| Elementary school | 73 | 17.5% |
| Junior high school | 168| 40.2% |
| Senior high school | 20 | 4.8%  |
| Diploma/Undergraduate | 46 | 11.0% |
| Graduate & Above | 99 | 23.7% |
| **Occupation** |    |       |
| Private employee | 51 | 12.2% |
| Self-Employed   | 14 | 35.6% |
| Government employee | 76 | 18.2% |
| Non labour force | 94 | 22.5% |
| Others          | 48 | 11.5% |

3.2. The estimated results

The analysis shows that the Likelihood Ratio (LR) Chi-Square of the models of the intention to purchase a new decoder is 157.14. Meanwhile, the values of $p >$ Chi-Square is 0.0000. This indicated that at least one predictor has significantly associated with the dependent variable. The results also show that the Pseudo $R^2$ is 0.1624. It implies that the proposed model can explain its dependent variable of 16.24%.

Estimated results in Table 2 show that eight out of 16 factors are relevant determinants of the respondents’ intention to purchase a new decoder. The factors consist of West, Central, Cable-based subscription, Satellite-based subscription, TV-Viewing duration, ease of use of the free decoder, the quality of digital terrestrial broadcasts, and the satisfaction against free decoder.

Regarding geographical location, namely, West and central areas, the negative findings imply that the samples in the West and central areas of Indonesia have a lower propensity to purchase a new decoder than respondents in the east. This finding is quite surprising as east areas are relatively less developed than the West and the Central regions. Nevertheless, an explanation can be proposed to this empirical evidence that respondents in the West and in the Central areas might have more media alternatives. Therefore, they are less likely to convert to DTT by using decoder sustainably.

Meanwhile, the irrelevance of the other demographic factors could be attributed to the fact that decoder is a family product. As a family product, purchasing decisions could be influenced by all family members [14], hence individual characteristics do not play an important role.

In terms of television consumption, the subscription to pay televisions, namely cable-based and satellite-based televisions, and daily TV-viewing duration is negatively associated with the purchasing
intention. These mean the subscribers of pay television and spend more time watching television are less likely to intend to purchase a new decoder. Particularly for pay television, the results could be attributed to the television's capability to provide more channels. Unlike DTT that can only provide free-to-air (FTA) channels, pay television offers FTA and a large number of interesting premium channels under the subscription packages. Thus, it makes perfect sense that pay television subscribers are not interested in moving to DTT. These negative associations also support a finding by Sarrina Li [15] that DTT and digital cable are two competing services.

The next significant predictors of respondents' interest in purchasing a decoder are their satisfaction with DTT quality and the free decoder they have received. The more the respondents were satisfied, the higher the respondents' probability of buying a new decoder. In previous work, DTT quality was confirmed to correlate with respondents' willingness to pay against DTT equipment positively [16]. The last, the ease of use of decoder also play an important role in encouraging respondents to purchase a new decoder once the free decoder is broken.

Table 2. Estimated results

| Demographics                  | Coef.   | Std. Err. | z      | P>z  |
|-------------------------------|---------|-----------|--------|------|
| Gender (dummy; ref: female)   | -0.1486 | 0.2048    | -0.7300| 0.4680|
| Age (dummy; ref: less than 35 years) | -0.1419 | 0.2409    | -0.5900| 0.5560|
| Education (dummy; ref: up to senior high school) | -0.1012 | 0.2808    | -0.3600| 0.7190|
| West area (dummy; ref: east area) ** | -0.5836 | 0.2792    | -2.0900| 0.0370|
| Central area (dummy; ref: east area) * | -0.5244 | 0.2741    | -1.9100| 0.0560|

| Television consumption        |         |           |       |
|-------------------------------|---------|-----------|--------|
| Cable-based subscription (dummy; ref: not subscriber) *** | -0.8878 | 0.2484    | -3.5700| 0.0000|
| Satellite-based subscription (dummy; ref: not subscriber) ** | -0.6431 | 0.2611    | -2.4600| 0.0140|
| Daily TV-viewing duration (dummy; ref: ≤ 3 hours) * | -0.3680 | 0.2026    | -1.8200| 0.0690|
| The number TV owned (numeric) | 0.1923  | 0.1966    | 0.9800 | 0.3280|

| The availability of terrestrial television signals (ref=not available) |         |           |       |
| The availability of public TV signal (dummy) | 0.1333  | 0.1490    | 0.8900 | 0.3710|
| The availability of private TV signal (dummy) | 0.0843  | 0.4761    | 0.1800 | 0.8590|
| The availability of abroad TV signal (dummy) | 0.1881  | 0.1635    | 1.1500 | 0.2500|

| The perception on DTT-related factors (all have 4 Likert scale) |         |           |       |
| Satisfaction on DTT quality ** | 0.5352  | 0.2385    | 2.2400 | 0.0250|
| Satisfaction on free decoder *** | 0.6338  | 0.2231    | 2.8400 | 0.0040|
| Free decoder ease of use * | 0.3054  | 0.1707    | 1.7900 | 0.0740|
| Free decoder age | 0.2023  | 0.1982    | 1.0200 | 0.3070|

*p < 0.1, **p < 0.05, ***p < 0.01

4. Conclusion
This study investigates the intention to adopt a new terrestrial digital decoder among free digital decoder recipients so that they can sustainably enjoy digital television broadcast, mainly when the free decoder cannot be utilized anymore. The results reveal that the intention to buy a decoder is associated negatively with geographical location (West and Central areas), the subscription to pay television (either cable-based or satellite-based), and daily TV-viewing duration. Meanwhile, positive associations are found among purchasing intention and the satisfaction with the quality of terrestrial digital television broadcasts, the ease of use, and overall satisfaction on the free decoder the respondents have received.
These findings imply that to drive the purchasing decision of terrestrial digital decoder, the government has to guarantee the quality of digital television broadcasts, the ease of use, and the quality of the decoder. First, the government has to ensure the availability of DTT transmitters ubiquitously to guarantee sufficient signal strength received by all Indonesian households. Second, the government is responsible for setting a standard of reception equipment that ensures ease of operation (For instance, by providing complete user guidance in Indonesian) and guarantees a proper process of the received signal to produce a better image and audio quality of digital broadcasts.

5. References

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