

FACTORS AFFECTING POST-ADOPTION IN A MUSIC STREAMING APPLICATION FOR YOUNG ADULTS

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Abstract— Indonesia is a potential market for the development of a streaming music application. This is marked by the emergence of various streaming music applications in Indonesia. However, the numbers of paid music streaming application subscribers are still low compared to those who use the free application. Meanwhile, one of the advantages gained by application providers is paid subscription services. In that regard, this research aims to increase the number of paid application users through a post-adoption approach, specifically stickiness, and word of mouth. It is expected that users who have benefited from paid services will recommend them to others. There are five hypotheses which will be tested in this research. The data will be analysed using a structural equation model (SEM) with Lisrel 8.8. The results of this research indicate that ubiquity and personalisation affect the usefulness, which in the end will increase stickiness and word of mouth. Informativeness was verified as having no effect on usefulness in this research. The implications of this research illustrate the efforts to increase the benefits of an application that users are willing to use the application on a long-term basis and recommend the use of paid applications to others.

Keywords— usefulness, stickiness, word of mouth

I. INTRODUCTION

Nowadays, the number of music streaming users in Indonesia has been increasingly growing; survey results from Dailysocial in 2018 showed that music streaming users in Indonesia had reached 88% (Zebua, 2018). The presence of music streaming in Indonesia is inseparable from the advancement of technology, hence people can access music anytime and anywhere. Music streaming development is expected to afford a better improvement to the music industry in Indonesia.

Indonesia itself is considered as a potential market for music streaming development due to its ability to provide a contribution of up to 43% of the total income of the overall music industry (Youngster.id, 2018). In addition, according to the Counterpoint survey, the

growth in the use of music streaming services through smartphones in Indonesia increased by 76% from 2012 to 2015 (Riadi, 2015). These conditions have encouraged the emergence of various music streaming application services such as Guvera, Spotify, Joox, Melon, Ohdio, Langit Music, Apple Music and Deezer (Deliusno, 2016).

Naturally, the increase in the number of application-based music streaming service providers will enhance competition, because users are faced with many preferences. The main thing to deal with is how to keep users from switching to other applications. In that regard, music streaming application service providers must be able to understand the behaviour of their users.

The application usage survey shows that during 90 days after download, the application usage decreases to 4% (Statista, 2016). Such data shows that users do not necessarily use an application continuously after downloading. This is an unfavourable condition for application providers. Consequently, a strategy that can retain application users in the long term is required. Kumar Roy et al. (2014) explain the concept of stickiness as a user's eagerness to use an application in the long term and the ability of the application to retain its users. Cyr (2008) states that stickiness can generate long-term profits for the company. Hence, increasing stickiness is one of the efforts which can be made by application providers to maintain users thus providing long-term profits.

Based on study results from App Annie, the behavior of Indonesians in purchasing an application also shows an exceptional case; 49% of consumers in Indonesia prefer applications that provide free contents and only 28% of consumers are willing to spend a considerable amount of money to obtain an application with paid content (Wijaya, 2015). This condition is surely not profitable for application service providers especially music streaming applications since every application created must be profitable in the long term. Through paid subscription applications, users can receive more facilities such as the ability to access and openly download all music, without ads. It is important to maximize the effort to enhance the numbers of paid

subscriptions since the numbers of paid customers are still relatively small.

According to Racherla et al. (2012), word of mouth (WOM) has a significant impact on influencing consumer choice. Recommendations from colleagues or close persons who have already used paid applications are quite an effective way to encourage changes in behaviour prompting unpaid music streaming application users to switch to paid ones, since, according to Kim et al. (2016), WOM is an important contributor to the success of an application in influencing its user's behaviour.

In regard to the above, this research aims to increase the number of paid music streaming application users, by observing the willingness of paid music streaming application users to use on a long-term basis (stickiness) and attempts to recommend to others (word of mouth) to use the paid application service.

II. LITERATURE REVIEW

Many previous kinds of research have investigated technology adoption (Davis, 1989; Venkatesh et al., 2012), but few have studied post-adoption in the context of technology (Kim et al., 2016). Research conducted by Racherla et al. (2012) states that post-adoption can be explained through stickiness and WOM. It is also known that WOM is a factor which can influence a person's decision to use technology (Kim et al., 2016). Therefore, WOM is used as an effort to persuade someone to change her/his behaviour towards the use of technology. Offline WOM is identified to have a greater influence on technology usage behaviour since many users have decided to use an application when their closest family and friends have directly recommended the technology (Racherla et al., 2012).

Stickiness is described as the frequency of use and time interacting with an application (Racherla et al., 2012) or the user's eagerness to reuse an application (Li et al., 2006). When users have used the application for a long period of time, they will be more likely to buy the services or products offered in the application (Huang & Chuang, 2007).

In discussing the behaviour of technology users, the theory that is widely referred to is the TAM (Technological Acceptance Model). Davis (1989) stated in the TAM theory that there are two factors that influence the use of technology, specifically, perceived usefulness and ease of use. According to Chou et al. (2013) usefulness is when an application can help the activities of its users. Accordingly, when users feel the benefits of the application, it can also increase the frequency of use. In addition, ease of use is the ease perceived by users when interacting with applications (Venkatesh et al., 2012), but this convenience only affects the initial stage of using the technology

(adoption) (Davis, 1989). In that regard, this research only adopts perceived usefulness due to the fact that it still has an influence on behaviour after using the technology (post-adoption).

According to Kim et al. (2016), a mobile application has different characteristics which are related to ubiquity, personalisation, and informativeness. These three characteristics are known to have an influence on a user's perceptions of the benefits when using an application.

III. HYPOTHESES

Users of music streaming applications prefer the ease of accessing services in line with the desired time. Hence, they are not fixated at a certain time to listening to their favourite songs. Balasubramain et al. (2002) stated that ubiquity is the ability of technology to be used anytime and anywhere. The convenience offered surely creates a perception of benefits in the minds of the users since they can access the application at any time. This is also supported by Arparci (2016) which stated that perceived ubiquity has an influence on perceived usefulness. This is in line with Nikou (2017), who also stated that an application would be useful when having the ubiquity characteristic, which is ease of access anytime and anywhere. In that regard, the ability of a music streaming application to develop features that support the ability to be accessible at anytime, anywhere is highly required. This is supported by Kim et al. (2016) who stated that the ability to develop features that are flexible to time and location can increase the benefits felt by its users.

A. H1: Perceived ubiquity has a positive influence on mobile app usefulness

The existence of music streaming applications truly supports their users to be able to easily access their preferred songs. In using the application, users always expect to be facilitated to obtain information on the latest songs or top chart songs. Methlie & Pederson (2005) stated that complete information presented on a mobile service can increase the benefits of the application. Therefore, the availability of information about the latest songs and genre of songs which fit their tastes will shape the users' perceptions that the application provides benefits. This is supported by Kim et al. (2013) who stated that mobile applications will have benefits if they are able to provide the information needed by their users. Therefore, it is expected that the amount of information or content that is sufficient or in accordance with the needs of its users will increase the benefits felt by its users (Kim et al., 2016).

B. H2: Perceived informativeness has a positive influence on the mobile app usefulness

When music streaming application users receive services, which suit their individual needs, in the form

of songs that suit their tastes, it will increase their motivation to use such music streaming. Kim et al. (2016) stated that service providers must utilise the power of more customised information content, namely information tailored to the needs of its users. By emphasising features that can provide the needs of songs that meet user expectations, this can lead to a better perception of the benefits of the music streaming application. Ho (2012) also states that services that can provide different information according to the needs of their users will improve their perception of the benefits of the application and, in the end, will motivate them to use the application. According to Lai et al. (2009), by providing more personal information, it will reduce the disruption of information which is not suitable for user needs and will further encourage users to feel the benefits of the application.

C. *H3: Perceived personalisation has a positive influence on mobile app usefulness*

Racherla et al. (2012) defined mobile application stickiness as a time when users spend their time interacting with a technology and how often users use the application for certain needs. In music streaming users, service providers must be able to increase the comfortability of their users since by such comfortability, they will improve the perception of benefits for users, hence a long-term relationship can be developed. This is supported by Bhattacharjee (2001) who stated that perceived usefulness affects a person's perception of willingness to continue to use technology. In addition, Limayem & Cheung (2008) also stated that perceived usefulness is one of the determining factors in terms of whether someone will use the technology on an ongoing basis.

D. *H4: Mobile app usefulness has a positive influence on mobile app stickiness*

When users of music streaming applications feel the ease of accessing the application, it encourages the users to use on a long-term basis. When a music streaming application has become part of their lifestyle, they will voluntarily recommend positive things about the application to those around them. This encourages users of music streaming applications to spread positive information directly through offline WOM (Kim et Al., 2016). In addition, Racherla et al. (2012) stated that stickiness is formed when a strong relationship between fellow application users occurs and such a relationship will increase the intention to spread positive WOM.

E. *H5: Mobile app stickiness has a positive influence on mobile app word of mouth*

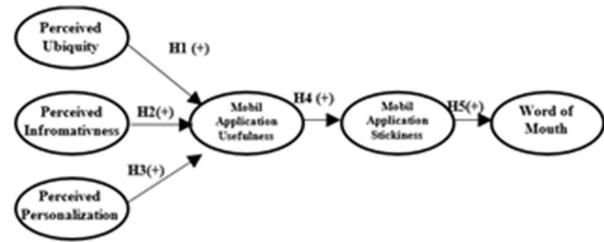


Fig 1. Research Mode

This research model was adopted from the research of Kim et al. (2016); however, the playful engagement variable was excluded considering that, in this research, music streaming applications do not provide elements of pleasure when interacting with the application.

IV. METHOD

The design in this research is descriptive research which aims to see the influence between variables. Respondents in this research were young adults aged 17-23 who used one of the paid (premium) music streaming applications for more than 1 month. In addition, respondents in this research were also required to use the application for more than two days in one week, and listen to the songs using the music streaming application for more than 3 hours in a day. The numbers of samples used in this research were 120 respondents. This research used nonprobability sampling with a judgmental sampling technique since framing of the population would have been impossible.

This research uses four variables, explicitly perceived ubiquity, perceived personalisation, perceived informativeness, usefulness, stickiness and word of mouth. The indicators built for each variable refer to several previous research theories. Questionnaires consisting of several indicators will be measured using a Likert scale 1-7 with number 1 indicating strongly disagree and number 7 showing strongly agree; the survey was delivered in Indonesian and distributed online.

TABLE 1. CONSTRUCT SOURCES

Construct	Number of Items	Sources
Perceived Ubiquity	3	Tojib & Tasernko (2012) and Kim et al. (2016)
Perceived Personalisation	4	Kim et al. (2016)
Perceived Informativeness	4	Teo et al. (2003)
Usefulness	4	Venkatesh et al. (2003)
Stickiness	4	Kumar et al. (2014) and Kim et al. (2016)
Word of Mouth	4	Kumar et al. (2014) and Kim et al. (2016)

The data in this research will be analysed using Structural Equation Modeling (SEM) with Lisrel 8.8. Data will be analysed using two stages in accordance with the theory of Hair et al. (2010). The first step is to carry out confirmatory factor analysis (CFA) to measure the validity and reliability of the measurement model. If all the data in the first stage are valid and reliable then we can continue to the next stage, which is the analysis of the structural model which aims to observe the influence between variables.

V. RESULTS AND DISCUSSION

The characteristics of respondents in this research are shown in Table 2. Respondents in this research were 71% aged 17-20 with 69% residing outside Jakarta. The majority of respondents used Spotify as the main platform for music listening (73%). In addition, 17% of respondents like to listen to music between 19:00-21:00 and 59% obtained information about music streaming applications from friends.

TABLE 2. DESCRIPTIVE STATISTICS

		Percentage (%)
Age	17-20	71%
	21-23	29%
Main music streaming platform used	Apple Music	8%
	Joox	18%
	Langit Musik	1%
	Spotify	73%
Information on music streaming application	Printed ads	1%
	Digital ads	17%
	Radio ads	1%
	TV ads	6%
	Family members	16%
Gender	Friends	59%
	Male	52%
Domicile	Female	48%
	Jakarta	31%
Time of music listening	Outside Jakarta	69%
	before 07:00	3%
	between 07:00 – 09:00	9%
	between 09:01-11:00	4%
	between 11:01-13:00	6%
	between 13:01 – 15:00	9%
	between 15:01 – 17:00	9%
	between 17:01 – 19:00	14%
	between 19:01 – 21:00	17%
between 21:01 – 23:00	15%	
	after 23:00	12%

A. Validity and Reliability

Table 3 shows the values of Construct Reliability (CR) and Variance Extracted (VE) for each measurement indicator showing numbers above 0.5 and 0.7. This shows that the indicators are reliable. The results of the validity test in this research indicate that the factor loading for each indicator is above 0.5 and the T-value is above 1.645 stating that all indicators are valid.

TABLE 3. VALIDITY AND RELIABILITY

Variable	Indicator	T-Value	Standardised Loading Factor	Construct Reliability (CR)	Average Variance Extract (AVE)
Perceived Ubiquity	PU1	10.51	0.81	0.84	0.64
	PU2	9.63	0.77		
	PU3	10.67	0.83		
Perceived Informativeness	PI1	8.15	0.68	0.85	0.60
	PI2	10.74	0.83		
	PI3	10.78	0.83		
	PI4	9.28	0.75		
Perceived Personalisation	PP1	9.94	0.78	0.88	0.65
	PP2	11.68	0.86		
	PP3	9.90	0.78		
	PP4	10.84	0.82		
Usefulness	USE1	11.04	0.83	0.85	0.60
	USE2	10.26	0.79		
	USE3	8.28	0.67		
	USE4	10.68	0.81		
Stickiness	MAS1	10.18	0.79	0.84	0.57
	MAS2	10.06	0.79		
	MAS3	8.87	0.72		
	MAS4	8.84	0.72		
Word of Mouth	WOM1	8.84	0.72	0.87	0.63
	WOM2	11.42	0.86		
	WOM3	8.28	0.69		
	WOM4	9.82	0.78		

B. Hypotheses Testing and Model Fit

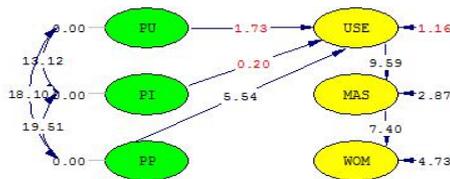
The results of the overall measure from the structural equation model in Table 4 show that there is conformity between the data and the research model which is indicated by the RMSEA in the value of 0.075, CFI of 0.98 and PNFI of 0.82 which is included as the acceptable fit category.

TABLE 4. MODEL FIT INDICES FOR THE OVERALL MODEL

Index	Value	Cutoff Value for GOF Index
RMSEA	0.075	RMSEA < 0.08
CFI	0.98	CFI ≥ 0.95
PNFI	0.82	0 ≤ NFI ≤ 1

TABLE 5. RESULT OF HYPOTHESIS TESTING. ONE-TAILED TEST

	Hypothesis	Estimate	T-value	Result
H1	Perceived ubiquity → mobile app usefulness	0.18	1.73	Accepted
H2	Perceived informativeness → mobile app usefulness	0.02	0.20	Rejected
H3	Perceived personalization → mobile app usefulness	0.81	5.54	Accepted
H4	Mobile app usefulness → mobile app stickiness	0.92	9.59	Accepted
H5	Mobile app stickiness → mobile app word of mouth	0.74	7.40	Accepted



Chi-Square=377.65, df=226, P-value=0.00000, RMSEA=0.075

Fig 2. Output Structural Model

The results of hypotheses testing in this research, as shown in Table 5 and Figure 2, show that the t-values for H1 (1.73), H3 (5.54), H4 (9.59) and H5 (7.4) exceed the predetermined t-value of 1.645 (one tail) which is data supporting the hypothesis. Meanwhile, the H2 hypothesis has a t-value of 0.2 which is below the predetermined t-value amounting to 1.645; thus, the data do not support the hypothesis.

C. Discussion

The results of this research indicate that ubiquity and personalisation have an influence on usefulness which will impact on increasing stickiness and word of mouth. This finding is in line with Lee (2010), Kim et al. (2016) and Limayem & Cheung (2008). Meanwhile, efforts to improve the usefulness of an application may be done through increasing ubiquity and personalisation. The results of this research are in line with Arparci's (2016) and Ho's (2012). However, in this research, informativeness was not proven to have an influence on usefulness. This happens because the music streaming application in each case is not the only source of information for a desired song. There are many other media which can provide such information, such as YouTube or Google; therefore, the information presented in the music streaming application are not seen as an added benefit. The results of this research are not in line with Mathlie and Peterson (2005), but in line with the findings of Lee and Hodges (2012).

The efforts which may be made by application developers to improve stickiness could involve

presenting more recent song variations from various genres. Hence, such an effort would encourage users to use the application for longer and more often. Accordingly, to improve usefulness, application development may increase the benefits of the application through increased ubiquity (Nikou, 2017) by adding accessible offline songs, thus users may continue to use the application whenever they need it even though they are not connected to the internet. In addition, you can also add a special data package offering features for music streaming applications; therefore, users can have access at any time without worrying about spending all of their internet quota. Consequently, those conveniences may increase the perception of benefits for the users so they are willing to use the application on a long-term basis.

In addition, personalisation also has a role to play in improving the perception of user benefits of an application, which is in line with the findings of Ho (2012). What can be done to improve personalisation is that a music streaming application must be able to recommend songs which suit the tastes, genres and mood of the users. This can be done by mapping what types of songs and at what time users are often listening to songs; thus, music streaming application providers could recommend songs which suit the tastes of their users.

D. Conclusion

In summary, this research has investigated factors affecting post adoption in the music streaming application. We used stickiness and word of mouth to examine variable influence the behavior of using music streaming application. In general, the results of this research indicate that ubiquity and personalisation affect usefulness, which, in the end, will increase stickiness and word of mouth. This research also shows that informativeness has no effect on usefulness. Therefore, mobile application provider should increase the benefit of their application in the user perspective. In order to encourage user to use this application any longer and recommend the use of paid applications to others.

REFERENCES

- [1] Arpaci, I. (2016). Understanding and predicting students' intention to use mobile cloud storage services. *Computers in Human Behavior*, 58, 150-157.
- [2] Balasubraman, S., Peterson, R. A., & Jarvenpaa, S. L. (2002). Exploring the implications of m-commerce for markets and marketing. *Journal of the academy of Marketing Science*, 30(4), 348-361.
- [3] Bhattacharjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS quarterly*, 25(3), 351-370.
- [4] Chou, C. H., Chiu, C. H., Ho, C. Y., & Lee, J. C. (2013). Understanding Mobile Apps Continuance Usage Behavior and Habit: An Expectance-

- Confirmation Theory. In *Pacific Asia conference on information system proceeding*, 132. June 18, 2013.
- [5] Cyr, D. (2008). Modeling web site design across cultures: relationships to trust, satisfaction, and e-loyalty. *Journal of Management Information Systems*, 24(4), 47-72.
- [6] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 13(3), 319-340.
- [7] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate Data Analysis 7th Edition* Pearson Prentice Hall.
- [8] Ho, S. Y. (2012). The effects of location personalization on individuals' intention to use mobile services. *Decision Support Systems*, 53(4), 802-812.
- [9] Huang, J. H., Lin, Y. R., & Chuang, S. T. (2007). Elucidating user behavior of mobile learning: A perspective of the extended technology acceptance model. *The Electronic Library*, 25(5), 585-598.
- [10] Kim, E., Lin, J. S., & Sung, Y. (2013). To app or not to app: Engaging consumers via branded mobile apps. *Journal of Interactive Advertising*, 13(1), 53-65.
- [11] Kim, S., Baek, T. H., Kim, Y. K., & Yoo, K. (2016). Factors affecting stickiness and word of mouth in mobile applications. *Journal of Research in Interactive Marketing*, 10(3), 177-192.
- [12] Deliusno (2016, April 03), Ini 8 layanan "Streaming" musik di Indonesia. Retrieved January 20, 2019. From: <https://entertainment.kompas.com/read/2016/04/03/195400910/Ini.8.Layanan.Streaming.Musik.di.Indonesia>
- [13] Lai, J. Y., Wang, C. T., & Chou, C. Y. (2009). How knowledge map fit and personalization affect success of KMS in high-tech firms. *Technovation*, 29(4), 313-324.
- [14] Lee, Z. C. R., & Hodges, N. (2012). An investigation of antecedents and consequences of consumers attitudes toward an apparel website. *Global Conference on Business and Finance Proceeding*. Vol 7, No.1, 718-734
- [15] Li, D., Browne, G. J., & Wetherbe, J. C. (2006). Why do internet users stick with a specific web site? A relationship perspective. *International journal of electronic commerce*, 10(4), 105-141.
- [16] Limayem, M., & Cheung, C. M. (2008). Understanding information systems continuance: The case of Internet-based learning technologies. *Information & management*, 45(4), 227-232.
- [17] Nikou, S. A., & Economides, A. A. (2017). Mobile-based assessment: Investigating the factors that influence behavioral intention to use. *Computers & Education*, 109, 56-73.
- [18] Methlie, L. B., & Pedersen, P. E. (2005). Network effects and intrinsic attributes of mobile services: Mapping perceived service values on business model choices. *Hong Kong Mobility Roundtable*, 1-3.
- [19] Riadi, Y. (2015, October 21), Joox sambangi Indonesia untuk layanan streaming musik aman dan legal. Retrieved April 10, 2019. From: <https://selular.id/2015/10/joox-sambangi-indonesia-untuk-layanan-streaming-musik-aman-dan-legal/>
- [20] Kumar Roy, S., M. Lassar, W., & T. Butaney, G. (2014). The mediating impact of stickiness and loyalty on word-of-mouth promotion of retail websites: A consumer perspective. *European Journal of Marketing*, 48(9/10), 1828-1849.
- [21] Racherla, P., Furner, C., & Babb, J. (2012). Conceptualizing the implications of mobile app usage and stickiness: a research agenda. *Available at SSRN 2187056*.
- [22] Statista (2016), Worldwide mobile app retention rate during the first 90 days of ownership as of March 2016, by mobile platform. Retrieved January 20.
- [23] From: <https://www.statista.com/statistics/243728/worldwide-mobile-app-user-retention-by-mobile-platform/>
- [24] Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 36(1), 157-178.
- [25] Wijaya, K.K. (2015, Nov 17) *Google: Meski penetrasi smartphone rendah, daya beli aplikasi di Indonesia sangat tinggi*. Retrieved March 8, 2019. From: <https://id.techinasia.com/google-studi-tingkah-laku-pengguna-smartphone>
- [26] Youngster.id (2018, June 20), Layanan music streaming penyelamat industri music. Retrieved April 10, 2019. From: <https://youngster.id/featured/layanan-music-streaming-penyelamat-industri-musik>
- [27] Zebua, F. (2018, March 3). Online music streaming survei in Indonesia 2018. Retrieved March 8, 2019. From: <https://dailysocial.id/report/post/online-music-streaming-i-n-indonesia-survey2018#>