Conference Paper

User Intention towards a Music Streaming Service: A Thailand Case Study

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Abstract

This paper presents a novel acceptance model for an online music streaming scenario of Thailand. The music streaming industry has been gaining in popularity in the recent times. This research has been conducted in order to measure the user attitude towards the use of this relatively new service using a modified version of the popular Technology Acceptance Model. We try to identify the most popular music-streaming service of Thailand and also the factors that affect the use of such a service. Data has been collected in the form of an online questionnaire survey from more than 300 participants for the purpose of model building and validation. A subsequent regression analysis carried out on the proposed model explains more than 60 percent of the variance of the dependent variable i.e. Behavioral Intention in our case to the predictor variables Perceived Usefulness, Perceived Ease of Use, Perceived Enjoyment and Perceived Satisfaction Level. The results show that Perceived Enjoyment and Perceived satisfaction are the two strongest predictors for Behavioral Intention which is quite different from that of the utilitarian type of information systems.

Keywords: Music streaming, TAM, hedonic information systems, regression

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Received: 14 November 2017
Accepted: 25 December 2017
Published: 8 January 2018

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the IAIT Conference Committee.

1. Introduction

In the recent times, there has been a dramatic rise in the use of cloud based media services. As per a report published in [1], multimedia traffic constitutes more than 55% of the overall Internet traffic and it is predicted to grow at a rapid pace. At the same time, the state of the global music industry is going through hard times and the sale of recordable media has long been decreasing. The scenario has even more worsened ever since illegal Internet downloads became possible through numerous torrent web-sites and from other pirated sources. The traditional way of music distribution from the production-house to the end-users is seeing a massive change in the form of emerging music streaming services with an aim to make-up for the losses. Previous research [2, 3] has hinted about the importance of new music services, but we still know little of the intention to use such a music streaming service.

The main goal of this research is to create a model that will help us in understanding the intention of the users towards using a music streaming service. This research has been scoped to the music streaming scenario of Thailand only. Since its inception the Technology Acceptance Model (TAM) has undergone a number of modifications [4]. TAM tries to gauge the Behavioral Intention (BI) of users through two constructs, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) [4, 5]. Originally, TAM was designed to measure the user's acceptance for utilitarian type of information systems. However, music streaming application is an example of hedonic information system which is quite different from utilitarian information systems [6]. Utilitarian systems try to provide some instrumental value to the users e.g. instructions to perform a task, while hedonic systems refer to those which provide self-fulfilling values e.g. enjoyment to the users. The measure of BI through PU and PEOU is best suited for the utilitarian information environment rather than the hedonic scenario in which Perceived Enjoyment (PE) plays a more important role [7].

In this research we have conducted an online questionnaire survey on more than 300 people all residing in Thailand. The results of this survey are used to build and test our proposed prediction model that measures the user intention towards the adoption of an online music streaming service. Due to the unsuitability of TAM to be used in hedonic scenarios, we have modified the original model to suit our needs and propose our own set of hypothesis along with the introduction of two new constructs. Remainder of the paper has been outlined as follows. Section 2 provides a very brief literature survey. We propose our research hypothesis along with the model in Section 3. Section 4 presents the research methodology along with the relevant data analysis. Finally, the conclusion and scope of future work has been given in Section 5.

2. Literature Survey

This section first covers the technology acceptance model and describes the various approaches. Next, we consider the present state of art music streaming scenario on a global scale.

2.1. Technology Acceptance Models

TAM is one of the most widely used models in studying the acceptance of new technology. It is basically derived from the Theory of Reasoned Action (TRA) [8] and predicts the user acceptance in terms of two factors; PU and PEOU. PU is defined as the

"prospective user's subjective probability that using a particular application/system will increase his/her job performance within context", while PEOU is defined as "the degree to which the user expects the target system to be free of efforts" [4]. However, traditionally TAM has focused on utilitarian type of information systems rather than on hedonic information systems which is the domain of this work. Researchers in [7 and 9] have shown that for utilitarian scenarios PU and PEOU and stronger predictors, whereas for hedonic scenarios PEOU and PE are more relevant. Similar work has been done by authors in paper [10], where they incorporate Playfulness and Learning-goal orientation in their acceptance model. Both the constructs that they introduce have an influence on PEOU via their effects on application specific self-efficacy. Authors in [11] introduce the concept of Cognitive Absorption (CA) as the main determinant of the two belief-constructs PU and PEOU. CA is defined as the state of deep involvement that contains the following five dimensions of cognitive absorption: temporal dissociation, focused immersion, heightened enjoyment, control and curiosity. Personal Innovativeness and Computer Playfulness are the two factors which they propose in order to measure the CA. Venkatesh et.al. in [12] proposed the TAM (version 3) in which the intrinsic motivations like Computer Playfulness and Perceived Enjoyment are introduced.

Based upon the above mentioned works, we can conclude that the hedonic nature of the information systems is an important condition that needs to be validated and corresponding changes must be incorporated into the original TAM. The striking difference is the fact that PU loses its predictive capacity to a great extent for a hedonic scenario, the place of which is taken by PEOU and other related factors depending upon the application scenario.

2.2. Global Music Streaming Scenario

Recently, the music industry globally has embraced the Internet as the most important channel for distribution as more than 45% of the revenue was earned through this medium in 2016 [13, 14]. Specifically, for the western markets the emergence and popularity of large online music markets like iTunes has resulted in increased revenues over the Internet. In fact iTunes became the largest music retailer in the United States in 2008 [14].

Researchers have tried to examine the experience of the music streaming services through the eye of self-presentation in [15]. Similarly authors in [16] and [17] try to find out the personality factors that can affect the music listening habit of a particular

individual while using streaming applications. Material and satisfaction differences that can exist between the physical and digital possession of music has been explained by authors in [18, 19 and 20]. However, user study between the intentions to download music versus streaming is scarce. Streaming and downloading of music differ on the amount of sense of control it provides to an individual [21]. Sense of control refers to the perceived ability to manipulate the digital content through a virtual environment. Authors in [22] find that the individuals are more likely to feel attached to the digital content if they have more control over it. Unlike downloading, streaming allows the users to retain control only over the addresses of the files i.e. the users never possess the physical copy of the file. This makes for instance certain features like remixing of songs virtually impossible in a streaming scenario.

From the above discussion we can conclude that there is a difference between owning a digital copy of music versus streaming it online. The intention of the users to use music streaming services over a prolonged period of time is an area which existing research has not focused upon. The recent surge in online music traffic may be due to the introduction of free trial periods by services like Apple Music, Google Play Music, etc. in which the users can explore all the features for free for a limited time frame (3 months maximum). Exceeding 3 months, the users need to pay for using all the features provided by the service. Keeping in mind certain limitations of the streaming scenario as discussed, it is a matter of investigation if music streaming can actually replace the traditional old way of listening to songs. This is the actual research question that we try to answer in this paper by creating a model (based upon the original TAM) for a hedonic scenario like music streaming. In the next section we present our research hypothesis and the model.

3. Research Model and Hypothesis

Fig. 1 shows our proposed research model along with the relevant hypothesis. Clearly, the model is a modified version of TAM. PU, PEOU and BI are the three original constructs that are an integral part of TAM. Perceived Enjoyment (PE) and Perceived Satisfaction (PS) are the two factors that we have introduced in this model. The definitions of PU, PEOU and BI are the same as outlined in the original TAM version in [4]. Here, description has been provided for PE and PS.

1. **Perceived Enjoyment (PE):** This factor is defined as "the degree/extent to which using a music streaming service is perceived to be enjoyable by a person in its own right".

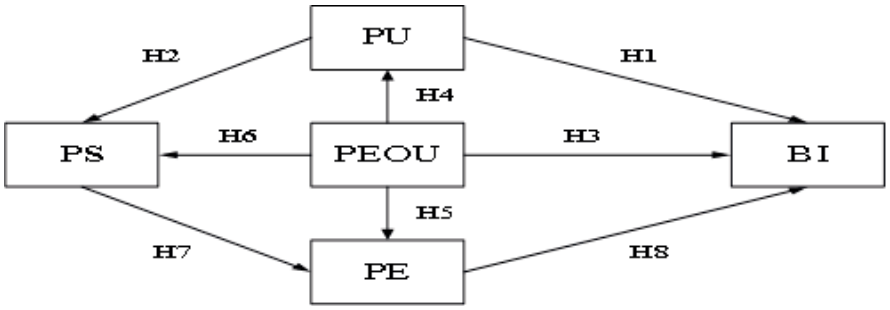

Figure 1: Research Model for Online Music Streaming.

2. **Perceived Satisfaction (PS):** This factor is defined as "the user's view about the quality received from the music streaming service, where all the perceived benefits and sacrifices are processed simultaneously in the user's mind, which leads to an overall judgment".

Corresponding to each factor a number of questions are asked to the participants in the survey, based upon which the final model is built. Details about the questions asked for each factor have been presented in the next section. Now, we explicitly frame the research hypothesis as given below. Explanation is provided only for the factors that we have introduced.

1. **H1: PU** has a direct positive impact on the actual behavioral intention BI to use a music streaming service.

2. **H2: PU** has a positive effect on the user satisfaction PS of the music streaming service.

   Explanation: If the users of the streaming service feel that it is useful to them in their daily life in some form, then it should improve the overall satisfaction level of the users.

3. **H3: PEOU** has a positive impact on the actual behavioral intention BI to use a music streaming service.

4. **H4: PEOU** has a positive effect on the PU of a music streaming service.

5. **H5: PEOU** has a direct positive impact on the perceived enjoyment PE of a music streaming service.

   Explanation: If the users find it very easy to use the music streaming service that does not require any special skills on their part, then they will enjoy using such a service. Thus, ease of use should be positively correlated to the perceived enjoyment.

6. **H6: PEOU** has a direct positive impact on the perceived satisfaction PS of a music streaming service.

   Explanation: Overall if the streaming service is easy to use in every aspect right from the search features provided to the user-interface design or some other factors, it will ultimately lead to a greater sense of satisfaction among the users.

7. **H7: PS** has a direct positive impact on the perceived enjoyment PE of a music streaming service.

   Explanation: If the users are generally satisfied in using the streaming service, then ultimately they will enjoy using such a service. Hence, the satisfaction level should be positively correlated to the enjoyment that the service provides to the users.

8. **H8: PE** has a positive impact on the actual behavioral intention BI to use a music streaming service.

   Explanation: If the users are thrilled and enjoy using the music streaming service, then the chances of adopting such a service will be high. Hence, greater enjoyment levels should ultimately lead to a higher degree of behavioral intention.

In the next section we provide the details of the research methodology used.

4. Research Methodology and Data Analysis

4.1. Data Collection from Target Population

In order to validate our proposed research model, an online survey is conducted in the form of questionnaires. The questionnaires are distributed to the target population by using Google Forms. Data has been collected over a span of 1 week (from 1st August, 2017 to 8th August, 2017) in which we received exactly 373 responses. Our target population is defined as the active online music streaming service users in Thailand who have been using the service for at least 3 months. Out of the 373 total responses received, 24 were filtered out as they had less than 3 months experience in using the service, thereby limiting our final sample size to 349. The users had to answer 32 questions in total. A 5 point Likert scale has been used in order to gauge the user intention towards using the music streaming service. All the responses were recorded into Google spreadsheet and later transferred to Statistical Package for Social Science (SPSS) for further analysis. Table 1 gives the detailed break-up of the demographic

profile of the respondents. Fig. 2(a) shows the breakup of the most popular streaming services being used in Thailand, while Fig. 2(b) shows the number of free and paid users for each service. Joox is the most popular music streaming service used in Thailand at 54% followed by YouTube at 35% and Apple Music at 11%. It is quite strange that a substantial portion of people think YouTube to be a music streaming platform, when strictly speaking it is a video streaming service. Almost 20% of the users who use Joox are paid members. Similarly, for Apple Music (being a paid service after the free trial period of 3 months) all the participants were valid paid subscribers of the service. YouTube does not charge any sort of subscription fees in Thailand due to which all the users using it were free users. This trend is quite encouraging as it shows that people are willing to pay money for the service they get, provided it lives up to their expectations. Preliminarily, this observation leads us to believe in the fact that the users have a positive intention to use a music streaming service.

Table 1: Demographic profile of the respondents.

Attribute	Category	Frequency	Percentage
Age	18-24 years	138	39.54
	25-34 years	119	34.09
	35-44 years	92	26.36
Gender	Male	132	37.82
	Female	217	62.18
Education Level	High School	81	23.21
	Bachelors	164	46.99
	Masters	95	27.22
	Doctoral	9	2.58
Internet Experience	Above 5 years	337	96.56
	3-4 years	12	3.44

Next we present the questionnaire details that have been administered to the users in order to collect data for the factors considered.

4.2. Questionnaire Details and Reliability Analysis

The participants had to complete the questionnaire using a 5 point Likert scale. The questions that have been asked in order to gain insight into each of the factors are presented in Tables 2 to 6 for the PU, PEOU, PE, PS and BI constructs respectively.

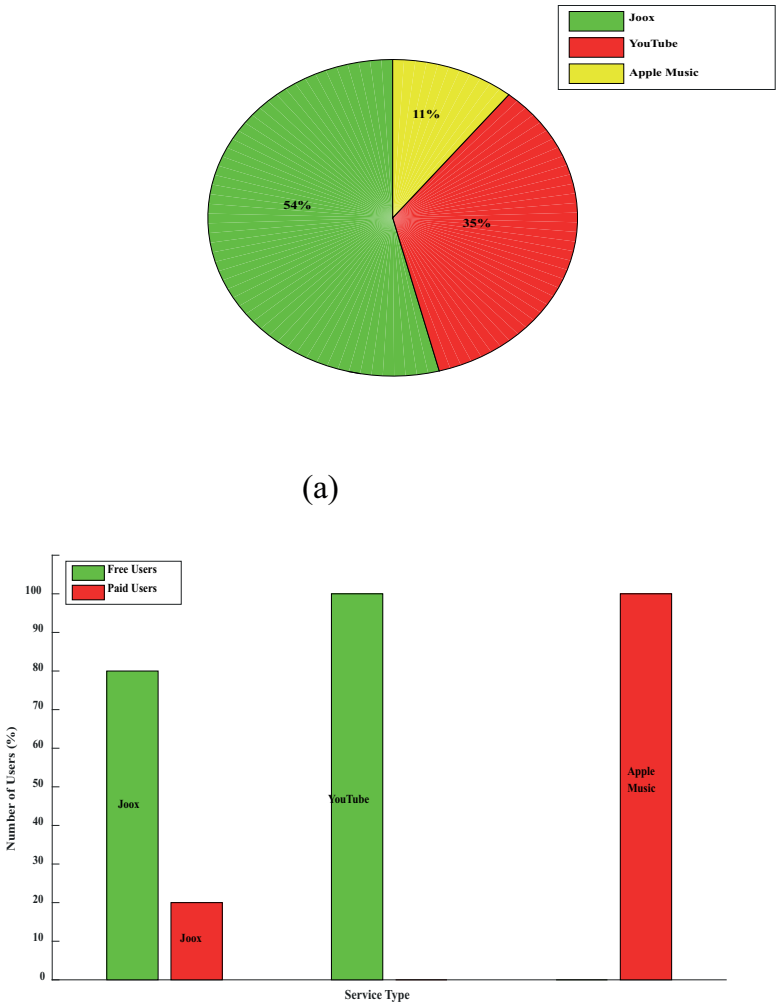

Figure 2: (a). Popularity of different music streaming services, (b) Percentage of free and paid users.

Before analyzing the data, we verify that the collected data is consistent and reliable. For reliability analysis, we choose to use the Cronbach's Alpha test. For the PU construct, when all the responses PU1 through PU6 are included, the corresponding Cronbach's Alpha value if quiet low (Cronbach's Alpha = 0.38). However, when we remove PU1, PU2 and PU3 the alpha value increases to 0.64. Similarly, for the PEOU construct, removal of PEOU3 and PEOU4 improves the alpha coefficient to 0.69 from its original value of 3.32 when all the opinions are considered. In case of the PE construct, when we consider all the responses PE1 to PE3, alpha value of 0.67 is obtained versus 0.70 when PE3 is removed. Although, removal of PE3 improves the alpha value slightly, yet we choose to include this factor because the initial value of 0.67 is quiet high enough to be included for further analysis. For the PS construct, the alpha value is highest (Cronbach's Alpha = 0.89) when all the responses PS1-PS4 are included. Finally, for the

BI construct we obtain alpha value of 0.61. The final set of sub-constructs (responses) that have been included for each construct after carrying out the aforementioned reliability analysis has been presented in Figs. 3 to 7 as shown below.

Table 2: Questionnaire for the PU construct.

Factor- Perceived Usefulness	Question
PU1	Do you find your current music streaming service useful?
PU2	Does your current service increase your productivity?
PU3	Does online music streaming provide any convenience over offline listening to song?
PU4	Do you prefer to pay for some extra features of your current music streaming service?
PU5	Is lossless audio important for your music listening?
PU6	Would you prefer to use a music streaming service without data charge?

Table 3: Questionnaire for the PEOU construct.

Factor- Perceived Ease of Use	Question
PEOU1	Is it easy to use your music streaming service?
PEOU2	Is the graphical user interface of your current music streaming application complicated?
PEOU3	Do you find your current streaming service flexible to interact with (customized playlist or theme)?
PEOU4	Do you require any special skills to use the streaming service?

Table 4: Questionnaire for the PE construct.

Factor- Perceived Enjoyment	Question
PE1	Do you enjoy the experience provided by your current streaming service?
PE2	Is it fun to use your current streaming service?
PE3	Does your current service provide enough local and international music contents?

Table 5: Questionnaire for the PS construct.

Factor- Perceived Satisfaction	Question
PS1	How satisfied are you in searching for a song in your current music streaming service?
PS2	How much satisfied are you in using your current online music streaming service?
PS3	How satisfied are you with the song quality of your current service?
PS4	Are you happy with the music collection that is offered by your current music streaming service?

Table 6: Questionnaire for the BI construct.

Factor- Behavioral Intention	Question
BI1	Do you want to switch over to a different music streaming application?
BI2	Do you plan to use music streaming on a long term basis?

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PU4	7.40	3.125	.596	.355	.518	
PU5	6.78	2.986	.473	.223	.550	.64
PU6	6.65	2.638	.458	.210	.421	

Figure 3: Reliability Analysis for the PU Construct.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PEOU1	3.5167	.830	.532	.283	.	.69
PEOU2	3.8333	.548	.532	.283	.	

Figure 4: Reliability Analysis for the PEOU Construct.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PE1	6.53	3.067	.559	.351	.499	.67
PE2	6.60	3.397	.518	.318	.566	
PE3	7.03	2.134	.456	.210	.700	

Figure 5: Reliability Analysis for the PE Construct.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PS1	10.23	7.606	.807	.696	.844	.89
PS2	10.00	8.237	.765	.620	.862	
PS3	10.13	8.694	.702	.519	.884	
PS4	10.33	6.938	.798	.663	.852	

Figure 6: Reliability Analysis for the PS Construct.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
BI1	3.73	1.080	.402	.162	.	.61
BI2	3.40	.685	.402	.162	.	

Figure 7: Reliability Analysis for the BI Construct.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.574	.717		.801	.427
	PU	-.030	.297	-.023	-.102	.919
	PEOU	-.105	.260	-.089	-.402	.689
	PE	.959	.123	.723	7.767	.000

a. Dependent Variable: BI

Figure 8: Regression Analysis for the PU, PEOU, PE and BI Constructs.

4.3. Hypothesis Testing using a Regression Analysis

In this section we present a multiple linear regression approach towards our hypothesis testing. The regression analysis has been carried out omitting the sub-constructs that were found to be unreliable in the previous section. Fig. 8 provides the result of the regression analysis for the PU, PEOU, PE and BI constructs with BI as the dependent variable. We find that only PE is the significant predictor (p value < 0.05) of BI. R^2 and $adjusted - R^2$ values of 0.602 and 0.581 are obtained respectively.

Fig. 9 shows the regression analysis for the PEOU, PS and PE constructs with PE as the dependent variable. In this case we find that only PS is able to significantly predict PE (p value < 0.05). The R^2 and $adjusted - R^2$ values obtained are 0.642 and 0.629 respectively. Fig. 10 shows the relationship between PEOU, PU and PS with PS as the dependent variable. For this case, we find that none of the relationships are significant. Hence, we had to exclude all relationships. For all these cases we used the stepwise method of variable entering scheme, wherein for each successive stages, the non-significant variable is removed.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.561	.446		3.499	.001
	PEOU	-.101	.076	-.114	-1.322	.191
	PS	.639	.074	.748	8.647	.000

a. Dependent Variable: PE

Figure 9: Regression Analysis for the PEOU, PS and PE Constructs.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.041	.506		9.954	.000
	PU	-.272	.374	-.231	-.729	.469
	PEOU	-.195	.328	-.188	-.593	.556

a. Dependent Variable: PS

Figure 10: Regression Analysis for the PEOU, PU and PS Constructs.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.532	.164		3.254	.002
	PEOU	.812	.044	.925	18.487	.000

a. Dependent Variable: PU

Figure 11: Regression Analysis for the PEOU and PU Constructs.

Finally, Fig. 11 shows the regression analysis for the PEOU and PU constructs. In this case we perform a simple linear regression. We observe a significant relationship between PEOU and PU (p value < 0.05) constructs. Table 7 summarizes the results that we obtain. The final research model has been shown in Fig. 12.

The next section presents the conclusion and the scope of future work.

5. Conclusion

In this paper we have presented a model that tries to find out the intention of the users in using an online music streaming service. We have limited the scope of our work only for those users who reside in Thailand and have at least 3 months experience in using a streaming service. The results that we obtain differ significantly from utilitarian type of

Table 7: Result Summary.

Path	Correlation Type	p- Value	Hypothesis No	Hypothesis Status
PU –> BI	Negative	0.919	H1	False
PU –> PS	Negative	0.469	H2	False
PEOU –> BI	Negative	0.689	H3	False
PEOU –> PU	Positive	0.000	H4	True
PEOU –> PE	Negative	0.191	H5	False
PEOU –> PS	Negative	0.556	H6	False
PS –> PE	Positive	0.000	H7	True
PE –> BI	Positive	0.000	H8	True

information systems. In such systems, PU and PEOU are considered to be the strongest predictors of BI. However, for our case these factors were not significant at all. In fact, the user intention to use the music streaming service depends only upon the level of perceived enjoyment and satisfaction. We attribute this sort of observation to the hedonic nature of our system under consideration. For hedonic systems such a music streaming, the users do not bother about the utility or other benefits that they might get out of the service. Rather, the focus is on pure enjoyment only. Higher the users are satisfied, more delightful they are in using the service and hence, the behavioral intention to use such a system also increases. Quite strangely, we find that the users do not bother about the quality of the songs that they can get from the service. Rather, the extent of music collection that the service provides both in terms of local and international artists is a far more important factor. Also, as long as using the service provides them with a sense of relaxation and enjoyment, the users are willing to opt for paid subscriptions too. Almost all the users intend to use the service on a long term basis. Hence, we can conclude that music streaming is an application that will definitely be viable if the service providers are able to come up with new ideas that tend to increase the enjoyment and satisfaction level of the users.

In this research we concentrated on the Thai population only. Also, we did not get enough information from the users regarding the reason of the popularity of certain music services over other ones. A detailed comparison between the traditional way to listening with this new scenario is also interesting. We plan to investigate all these factors as a part of our future work.

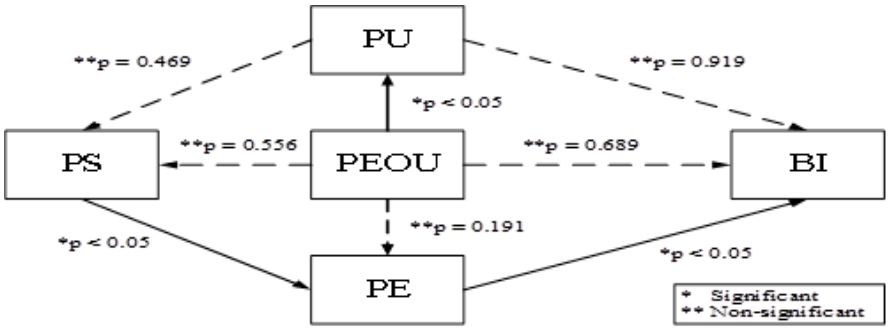

Figure 12: Final Research Model.

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