ผลกระทบของการรับรู้ทัศนธาตุต่างๆ ที่มีต่อความตั้งใจซื้อแอพพลิเคชันเกมใหม่ ของผู้ใช้สมาร์ทโฟนในประเทศไทย

THE EFFECTS OF PERCEPTION OF VISUAL ELEMENTS ON PURCHASE INTENTION OF NEW GAME APPLICATIONS OF THE SMARTPHONE USERS IN THAILAND

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บทคัดย่อ

การใช้สมาร์ทโฟนในปัจจุบันมีการเพิ่มขึ้นอย่างต่อเนื่อง แนวโน้มนี้จะสร้างโอกาสให้แก่นักพัฒนาในการพัฒนาแอพพลิเคชันในมือถือให้ดียิ่งขึ้น ทัศนธาตุต่างๆ ของแอพพลิเคชันในมือถือมีบทบาทสำคัญที่จะส่งผลต่อความตั้งใจซื้อของผู้บริโภค การศึกษาครั้งนี้ให้ผลการวิจัยเชิงประจักษ์ที่เกี่ยวข้องกับผลกระทบของการรับรู้ทัศนธาตุต่างๆ ที่มีต่อความตั้งใจซื้อแอพพลิเคชันเกมใหม่ในกลุ่มผู้ใช้สมาร์ทโฟนในประเทศไทย ในช่วงเวลาที่ได้ทำการศึกษาวิจัยนี้ แอพพลิเคชันเกมใหม่ "แรบบิดส์ บิ๊ก แบง" ได้ถูกเลือกมาเป็นตัวอย่างของเกมใหม่ในการศึกษาครั้งนี้ ข้อมูลการวิจัยเชิงสำรวจนี้แสดงให้เห็นอย่างชัดเจนว่าองค์ประกอบภาพไอคอนของแอพพลิเคชัน ภาพชื่อของแอพพลิเคชัน ภาพรูปตัวอย่าง ภาพเนื้อหาของแอพพลิเคชัน และภาพข้อมูลของนักพัฒนาสามารถส่งผลกระทบในเชิงบวกต่อความตั้งใจซื้อ ในขณะที่ภาพปุ่มราคามีผลกระทบในเชิงลบต่อความตั้งใจซื้อของผู้บริโภค นอกจากนั้น ผู้วิจัยยังค้นพบว่าผู้บริโภคเพศชายประเมินชื่อเสียงของนักพัฒนาเกมในระดับที่สูงกว่าและมีความตั้งใจซื้อมากกว่าผู้บริโภคเพศหญิง ผู้วิจัยยังค้นพบอีกด้วยว่าผู้บริโภคที่เคยซื้อเกมจำนวนมากกว่ามองว่าเกมใหม่ราคาถูกกว่าและประเมินภาพตัวอย่างในระดับที่ต่ำกว่าผู้บริโภคที่เคยซื้อเกมเป็นจำนวนน้อยกว่า อย่างไรก็ตาม ผู้บริโภคเหล่านี้ประเมินภาพข้อมูลเกี่ยวกับความเข้ากันได้ของระบบในระดับที่สูงกว่าและมีความตั้งใจซื้อในระดับที่มากกว่าด้วย

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Abstract

The use of smartphones has dramatically increased recently. This trend brings the opportunity for developers to create better mobile applications. To influence consumer purchasing intention, visual elements play an important role. This study provides empirical findings related to the effects of perception of visual elements on purchase intention of new game applications among the smartphone users in Thailand. At the time of conducting this study, a new game application called "Rabbids Big Bang" was selected for investigation. The survey data indicated strong support that visual elements including the application icon, the name of the application, the screenshots, the description page and the developer information could positively impact on purchase intention whereas the price button could negatively influence on purchase intention. In addition, the researchers found that male consumers assessed the reputation of the game developer at a higher level and indicated a higher level of purchase intention compared with female consumers. The researchers also found that the consumers who purchased more games perceived a cheaper price and rated the screenshots lower than those who purchased fewer games; however, they rated the compatibility higher and showed a higher level of purchase intention.

Keywords: Game Application, Visual Element, Smartphone, Game Developer

Introduction

The use of smartphones has dramatically increased in recent years (Ayalew, 2011; Morimoto & Nagahata, 2013; Peabody, 2012). Many people use smartphones on a daily basis not only to make or to receive calls, but also to access to the Internet, to chat and to play games. These behaviors bring an opportunity for developers to create new mobile applications (or in short "apps") (Peabody, 2012). With their smartphones, people can easily download or purchase game apps via mobile application stores such as Apple's App Store and Google's Android Market. Game apps are always the popular programs of all times (MacMillan, Burrows & Ante, 2009; Peabody, 2012). They are usually ranked in the top five purchased apps, the top five free-downloading apps, and the top five searching apps.

Nowadays, a large number of people play games on their smartphones daily and weekly (Information Solutions Group, 2011; Osman, Talib, Sanusi, Shiang-Yen & Alwi, 2012). Also, the number of smartphone owners purchasing game apps is increasing (Information Solutions Group, 2011). This activity brings a lot of revenue to game developers. As a result, developers continuously create and introduce game apps along with the growth of smartphones (Ayalew, 2011; Maestri, 2010; Peabody, 2012). Many researchers tried to investigate what factors could encourage smartphone users to download or purchase apps. For example, Ayalew (2011) studied the app purchase via only desktop computers. There are many different types of game apps available in the stores. Consumers are unique and may have different perceptions and opinions when they decide to download or purchase the apps. Visual elements, defined as the elements of line, shape, tone, color, pattern, texture and form which people can see or observe, can play an important role for decision making of customers in the purchase of apps (Ayalew, 2011). Different genders such as male and female may have different ways of reviewing visual elements. Moreover, consumers who have had more experience in purchasing more games may have different perspectives on visual elements compared with those who have purchased fewer games. In this study, the researchers would like to explore consumers' perception of visual elements in relation with the purchase intention of game apps. Possible difference between genders of consumers and prior experiences in purchasing game apps would also be investigated. The main research question for this study is "What are the game visual elements' characteristics that can influence on purchase intention?"

Objectives and Scope of the Study

The purpose of this study is mainly to identify visual elements that smartphone users consider when downloading or purchasing game applications from mobile apps stores such as Apple's App Store and Google's Play Store. The findings of this study would benefit game developers because they would be able to understand consumer behaviors and figure out how to create visual elements of game apps to attract more downloads and purchases.

Since many people use different operating systems of smartphones such as IOS or Android system to access to different mobile app stores, the visual elements appearing on IOS system, Android system or other systems can be presented in different ways. To limit the scope of this study, the researchers only focused on investigating the perception of the Apple iPhone users in Bangkok, Thailand. The main reason is because Apple's App store is the first successful mobile store (Maestri, 2010). Even though there are more than 160,000 game apps available on

the Apple's App Store (App Store Matrics, 2013a) and about 175 new coming game app each day (App Store Matrics, 2013b), this study focused only on one game app to control for the context of the investigation of the consumers' perception of visual elements. The selected game app that was suitable for this study was not a popular game or episode game due to several reasons. First, popular games such as Angry Birds, Plant vs. Zombie, Candy Crush, etc. are well known; therefore, words of mouth can lead to a purchase intention without considering visual elements. Secondly, episode games such as Angry Birds, Fruit Ninja, or Alpha Racing consist of the characteristics that have been adapted and upgraded from the previous episodes from which the consumers might have had prior experience of playing the games, which in turn could influence their perceptions (Maghanati & Ling, 2013). Consumers with good experience and usage might have a positive attitude toward the previous versions and might intend to purchase the game without considering visual elements. As a consequence, a game that was appropriate for this study was a new game app that the potential customers had never experienced before. The researchers investigated their perception on the visual elements of the selected new game and assessed their purchase intention. At the time of this study, the selected game was Rabbids Big Bang which was a new game and had no previous episode.

Literature Review and Conceptualization of the Research Model

The concept of purchase intention is one of the most popular issues being discussed in the field of consumer behavior process in decision making (Kotler & Keller, 2009). Especially in the consumers' buying process model, purchase intention is established in the fourth stage after problem recognition, information search, and evaluation of alternatives, respectively (Kotler & Keller, 2009). First, in the stage of problem recognition, consumers will detect a stimulus which raises a need. Consumers may want to seek excitement and fun or may be influenced by friend's purchases, advertisement, and magazines. Next is the process of searching for information. Consumers might recall memories about a product that they have encountered in the past or what their friends or family have suggested for them. They can also be influenced by advertisements and may try to find information about the product on the Internet or other sources. Then, the potential consumers will begin to evaluate many different types of games and compare them based on his or her preferences. When the user tries to download or purchase an app from the mobile store, textual and graphical information will impact on their decision making (Ayalew, 2011). With better graphical design icons, smartphone users can make a better decision when more game alternatives are presented to them (Ayalew, 2011). Thus, evaluation of alternatives is the stage where visual elements start to play an important role in influencing purchase decision (Ayalew, 2011). The decision process of potential buyers usually starts when they first see an app icon, then decide to click on the app icon, visit to the product page, browse through the app pictures or screenshots, read the app description, and finally they may have a purchase intention (Ayalew, 2011). When consumers decide to purchase an app, they will go through all the information available in the store. Visual elements such as the description, the screenshots, icons, fonts, names of the apps and customer reviews can also have a great impact on download decision (Ayalew, 2011).

In the context of evaluation of game apps, visual elements can be referred to any items that a customer may see on the screen when he or she clicks on a game icon. At first, the customer can see only three visual items per one app, including an app icon, name of the app, and price button on the screen. Because these three elements can be seen at the first glance, their attractiveness is very important for product evaluation (Micu, Coulter & Price, 2009). The attractive items can strongly influence the customer to click in order to see other information inside the app. For example, colorful app icon (Ayalew, 2011), good attitude name app (Salciuviene, Ghauri, Streder & De Mattos, 2010) and 'free' price button (Suk, Yoon & Song, 2008) can influence on download and purchase intention.

For iPhone users, there are nine visual elements including app icon, name of the app, price button, screenshots, description, game information, developer information, rating and customer review. Since this study focused on evaluation of the visual elements of the new game apps that were just released, rating and customer review information was rarely available. Therefore, rating and customer review were dropped from this study. The other seven visual elements were investigated based on the respondents' evaluation of Rabbids Big Bang, a new game app that was released at the time of this study.

Application icon It is obvious that an application icon can be one of the first impressions when consumers search for an app (Ayalew, 2011; Siau, 2005). A simple app icon is better than a complex app icon in terms of grasping attention (Wiedenbeck, 1999). The icon can be text-based or image-based button, which is a tiny picture that can represent the computer actions (Siau, 2005; Wiedenbeck, 1999). An app icon is unique for each specific game. An attractive app icon can lead to a consumer's positive attitude toward the application and increases the likelihood to click and look through the app (Ayalew, 2011). In addition, colorful icons (Ayalew, 2011) and playful characters (Ho & Wu, 2012) can grasp visitors' attention and may influence them to review the game and make a decision whether to download or not. Thirdly, the attractive icon can link to customers' memory (Alamgir, Shamsuddoha & Nedelea, 2010; Siau, 2005; Wiedenbeck, 1999). It helps users to memorize and recognize functions which are available within an application (Siau, 2005; Wiedenbeck, 1999). One of the techniques to design app icon that can link to customers' memory is to create resemblance icon or to create an image that looks like what it means (Siau, 2005). For example, Rabbids Big Bang icon is designed to link to users' thinking about crazy rabbits (Rabbids Official website, 2014). Based on the previous literature review, the following hypothesis is proposed:

H1: There is a positive relationship between an attractive game-app icon and the purchase intention.

Name of the Application The name of the application is similar to a brand name that helps customers to recognize products more easily (Salciuviene et al., 2010). Recognition plays a significant role when customers read about an app. A good name of the app should be unique, clear, and easy to pronounce (Alamgir et al., 2010). It can also be one of the major visual elements that influence on purchase intention. The name of the app should be associated with positive attitude (Bellman, Treleven-Hassard, Robinson, Varan & Potter, 2013; Salciuviene et al., 2010;), thus grasping customers' attention to read and to perceive attributes about the app (Alamgir et al., 2010). For example, after people read the app name "Rabbids Big Bang", the image of rabbits and the explosion might appear in their mind. Secondly, phonetic structure such as sounds of the name may also impact the customers' attitude (Salciuviene et al., 2010). For a

game app, the sound of the name should be related to the game with excitement. Consequently, the researchers proposed the following hypothesis:

H2: There is a positive relationship between the positive attitude toward the name of the app and the purchase intention.

Price button The definition of price is defined as the amount of money that customers must sacrifice to acquire an app they desire. Pricing can have a great impact on purchase intention (Suk et al., 2008). Thus, the price button is believed to be a visual element that influences on consumers' purchase intention, especially when consumers compare prices between many different game apps (Suk et al., 2008). A low price on the app button is a key for purchase intention. A cheap app is more attractive for people to download than an app with a high charge (Suk et al., 2008). As a consequence, it is hypothesized that

H3: There is a negative relationship between perceived expensive price button and the purchase intention.

Screenshots Screenshots are sample images that demonstrate an app. For the Apple's App Store, five screenshots are allowed on the product page (iPhone Apple's Store, 2013a). The screenshots include character, color, shape, texture or any piece of information that can be recognized from the actual products (iPhone Apple's Store, 2013b; Poornima & Hiremath, 2013). Screenshots are useful for customers because they can preview an app before deciding to download or purchase. When customers click through a specific app, most of them will look at the screenshots before reading the description and other information (Gordon, 2010; Padre, 2013a). Thus, attractiveness of the screenshots plays a significant role for decision making. If customers have positive attitude toward the screenshots, they may download the app. As a result, developers must select the screenshots in order to maximize effectiveness of marketing (Padre, 2013a). The attractiveness of the screenshots that can lead to a purchase intention should involve beautiful and well-designed background, exciting headlines and taglines and good-looking characters (Ayalew, 2011; Gordon, 2010; Padre, 2013a; Shao-Kang, 2008). The hypothesis is therefore

H4: There is a positive relationship between attractive screenshots and the purchase intention.

The Description of Application Description page is a good start where customers can read all information related to the app in details. Some people might say that an app description is similar to a product description (Macdonald, 2013; Padre, 2013b). A developer should use available space to promote, describe, and narrate an app in an interesting way. As a result, a well-written app description can convince customers to buy the app. A good description should include exciting words in the first paragraph in order to grasp customers' attention. A developer should take full advantage of the first few lines before the "more button". For example, the developers of Rabbids Big Bang started the first line with exciting sentence, "Forget the Milky Way! This is the Rabbids Way!" In addition, a good app description should entice customers with benefits, such as fun and the real experience that customers will gain from playing the game app (Macdonald, 2013; Padre, 2013b). A well-written app description should appeal to the readers' imagination (Macdonald, 2013). The aforementioned literature leads to the development of following hypothesis:

H5: There is a positive relationship between a well-written game description and the purchase intention.

Game information Customers can see eight elements from the game information. These elements are seller name, app category, date updated, current version, app size, rating, compatibility, and in-app purchases of the game (iPhone Apple's Store, 2013b). Customers may review through each game information element before making a purchase decision. Especially for the compatibility information, customers may pay the most attention because their smartphones must conform to these compatibility requirements in order to download (Ayalew, 2011). The literature leads to the following hypothesis:

H6: There is a positive relationship between the compatibility of the system requirements and the purchase intention.

Developer information Developers' work includes designing and programming of an app. The developer information that customers may see are other apps produced and the developer's website. In this study, Ubisoft is a game developer company of Rabbids Big Bang. Customers may review Ubisoft by viewing other game apps that the company developed or searching other information on Ubisoft's website before deciding to download or purchase. A developer's famous reputation can positively influence on the purchase intension (Pan, Kuo, Pan & Tu, 2013; Yoon, Guffey & Kijewski, 1993). The company's reputation can also influence buyers' expectations toward the quality of products and services (Yoon et al., 1993). Consumers who have experienced playing other game apps produced by a company will realize the company. Trustworthiness also has an impact on purchase decision (Kim, 2012). Customers who have good experience playing a developer's games are believed to trust the developer. As a consequence, it is hypothesized that

H7: There is a positive relationship between reputation of the developer and the purchase intention.

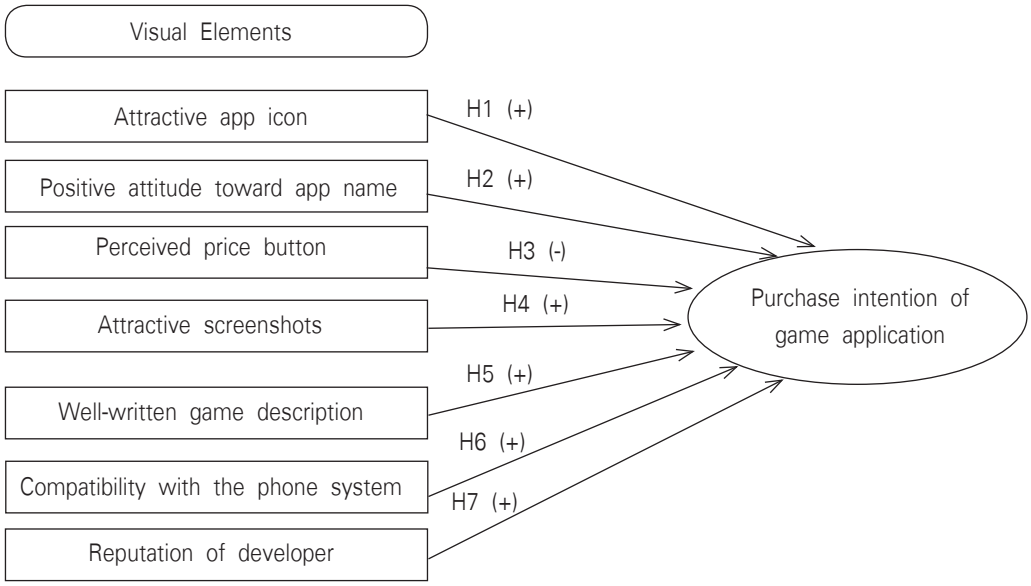

Figure 1 Conceptual Model

Research Methodology

In this study, the researchers conducted a survey research to collect primary data. The survey questionnaires were used to ask the respondents to provide personal information and assess visual elements of the selected sample game, which was Rabbids Bigbang. Each of the seven visual elements was presented to the respondents sequentially in order to isolate the assessment for each element of the game. Each visual variable was measured by at least two statements using 5-point Likert scale (1-strongly disagree to 5-strongly agree). The measurement items of app icon consisting of four items were adapted from Alamgir et al. (2010), Ayalew (2011), Siau (2005) and Wiedenbeck (1999). Four items measuring the name of the app were adapted from Alamgir et al. (2010), Bellman et al. (2013) and Salciuviene et al. (2010). Two measurement items of price button were adapted from Battle (2008) and Suk et al. (2008). Next, screenshots were measured by four items adapted from Ayalew (2011), Gordon (2010), Padre (2013a) and Shao-Kang (2008). Three items measuring the game description were adapted from Macdonald (2013) and Padre (2013b). To assess the compatibility of the phone's operating system, the researchers adapted two items based on Ayalew (2011). The developer information was measured by four items adapted from Kim (2012) and Yoon et al. (1993). Finally, purchase intention was measured by three items adapted from Tan (2013).

Based on the statistic report presented by National Statistical Office of Thailand (2012), Bangkok had the highest smart phone users. The age of most mobile phone gamers were less than 34 years old (Information Solutions Group, 2011). Therefore, in this study the researchers focused on the consumers aged 18-34 years who were iPhone users living in Bangkok metropolitan area. According to the record of National Statistical Office of Thailand (2013), the estimated population in Bangkok whose age range fell between 18-34 years comprised 1,367,605 people. According to Gfk Retail and Technology Thailand (2013), approximately 12 percent of the smartphone consumers used Apple's iOS; therefore, the target population was 164,113 people. Consequently, the researchers calculated the sample size by using Yamane (1967) formula at the significance level of 0.05 and obtained the sample size of 399.03, rounded up to 400 for this study. Quota sampling was used to obtain 200 male respondents and 200 female respondents. The period of data collection was four weeks in which the researchers conducted research in different periods of time (mornings, afternoons and evenings) and days (weekdays and weekends) in Bangkok metropolitan area. The response rate was approximately 43%.

Results and Discussion

Table 1 summarizes the demographic characteristics of the respondents and the number of game apps they purchased during the past six months. Most of the respondents were 18-25 years old and were students at a bachelor's degree level. Among the 400 respondents, 31.3% purchased only one game app during the past six months. 23.8% of the respondents purchased two game apps and 18.5% purchased three game apps during the past six months.

Table 1 Demographic Characteristics of the Respondents and Number of Purchased Game Apps

Demographic Characteristics	Number of respondents	Percentage
Gender		
Male	200	50%
Female	200	50%
Age		
18-25 years old	333	83.2%
26-34 years old	67	16.8%
Educational Level		
Below bachelor's degree	1	0.2%
Bachelor's degree	318	79.5%
Master's degree	81	20.3%
Purchased game apps during the past six months		
1 game app	125	31.3%
2 game apps	95	23.8%
3 game apps	74	18.5%
4 game apps	37	9.2%
5 game apps	20	5.0%
More than 5 game apps	49	12.2%

The researchers assessed the measures in terms of convergent validity and discriminant validity by performing factor analysis. The results are summarized in Table 2.

Table 2 Results of Reliability Statistics and Factor Analysis

Measures	Standardized Factor Loadings	Cronbach's α Reliability Coefficients
App icon	0.798-0.840	0.819
App name	0.743-0.819	0.835
Screenshots	0.673-0.853	0.812
The description	0.768-0.810	0.834
Compatibility	0.920-0.922	0.853
Developer information	0.772-0.910	0.893
Purchase intention	0.810-0.827	0.937

According to Table 2, there was no problem of cross loading among all factors except for one of the two items of perceived price button which was dropped from further analysis. All factor loadings are greater than 0.5, and internal consistency of all measures is demonstrated through Cronbach's alpha reliability coefficients of approximately 0.7 or higher (Nunnally & Bernstein, 1994). The researchers then used the mean scores of each construct in regression analysis. We performed univariate analysis of all variables to ensure normality of data distribution. In the

statistical procedures of multiple regression analysis, outliers, heteroscedasticity of residuals and multicollinearity were also examined to ensure that violation of assumptions underlying multiple linear regressions was not present and the estimate of the regression coefficients was not biased. The results of the regression analyses are summarized in Table 3. The regression model with purchase intention as the dependent variable was statistically significant at the significance levels of 0.01 (F-statistics = 61.891, p-value = 0.000) and explained about 52.5% of the sample variance of the respondents' purchase intention (R^2 = 0.525).

Table 3 Results of Regression Analyses – Estimates of Relationships

Measurement	Y = Purchase Intention		
	Unstandardized beta coefficient	Standard error	Sig.
App icon	0.150**	0.057	0.009
App name	0.415**	0.054	0.000
Price button	-0.137**	0.034	0.000
Screenshots	0.238**	0.064	0.000
Description	0.474**	0.057	0.000
Compatibility	0.051	0.060	0.400
Developer information	0.101**	0.036	0.005

* p < 0.05, two-tailed. ** p < 0.01, two tailed.

According to the regression analysis results in Table 3, the independent variables including app icon, name of the app, price button, screenshots, the description, and developer information were statistically significant at the significance level of 0.01. However, the compatibility of the phone system was not statistically significant. First of all, the regression results indicated that an attractive game-app icon had a positive effect on purchase intention (b = 0.15, p-value < 0.01). Therefore, Hypothesis 1 was supported. The higher the level of assessment in terms of the attractiveness of the app icon, the greater the likelihood for the consumers to intend to purchase the game app. Secondly, there was a positive relationship between perception toward the name of the app and purchase intention (b = 0.415, p-value < 0.01). Thus, Hypothesis 2 was supported. Next, there was a negative relationship between perceived expensive price and purchase intension (b = -0.137, p-value < 0.01), supporting Hypothesis 3 indicating that the higher the level of perceived expensiveness of the price, the lower the tendency for consumers to purchase the game app. Fourthly, there was a positive relationship between attractive screenshots and intention to purchase (b = 0.238, p-value < 0.01). As a result, Hypothesis 4 was also supported indicating the higher the level of perceived attractive screenshots, the higher the level of purchase intention. The fifth visual element which was analyzed was the game description. The results indicated that a well-written game description had a positive relationship with purchase intention (b = 0.474, p-value < 0.01). Therefore, Hypothesis 5 was supported. Next, there was no significant relationship between the compatibility of the system and purchase intention (b = 0.051, p-value > 0.05). Thus, Hypothesis 6 was not supported. Lastly, the regression results indicated that trust and reputation of the developer had a positive effect on purchase intention (b = 0.101, p-value < 0.01). Consequently, Hypothesis 7 was supported.

The researchers further probed into the possible effect of genders on the assessment of visual elements and purchase intention. Table 4 presents t-tests of the difference between the mean scores of the factors assessed by two independent groups of respondents classified by gender. By using the significance level of 0.05, according to the t-tests, there was a significant difference between the average levels of assessment of reputation of game developer between male and female respondents, and there was a significant difference between the average levels of purchase intention between male and female respondents. Male consumers were more likely to assess the reputation of game developer higher than female consumers and they also had a higher level of purchase intention compared to female consumers.

Table 4 Comparison of Respondents' Assessment of Visual Elements by Gender Group

	Gender	N	T-test	Sig.	Std. Deviation	Mean	Level
App icon	Male	200	-0.508	.612	.73569	3.7117	High
	Female	200			.70691	3.7483	High
App name	Male	200	1.114	.254	.74727	3.3738	Moderate
	Female	200			.78435	3.2863	Moderate
Price button	Male	200	-0.807	.420	1.115	2.39	Low
	Female	200			1.116	2.48	Low
Screenshots	Male	200	-1.894	.059	.65846	3.6850	High
	Female	200			.66131	3.8100	High
Description	Male	200	0.391	.696	.76855	3.5750	High
	Female	200			.76435	3.5450	High
Compatibility	Male	200	0.279	.780	.58307	4.4350	Very High
	Female	200			.66800	4.4525	Very High
Developer info	Male	200	2.621**	.009	1.13281	2.6813	Moderate
	Female	200			.91604	2.4113	Low
Purchase intention	Male	200	0.642*	.042	1.06326	3.1033	Moderate
	Female	200			1.01190	2.8917	Moderate

* $p < 0.05$, two-tailed. ** $p < 0.01$, two tailed.

In addition to the gender effect on purchase intention, the researchers also investigated whether there was any difference between the respondents who purchased more or less game apps during the past six months. To do this, the researchers classified the respondents into two groups. Group 1 consisted of 220 respondents who purchased one or two games during the past six months. Group 2 consisted of 180 respondents who purchased three or more games during the past six months. Table 5 indicates the t-test results of the difference between the mean scores of each factor and the two groups of respondents. At the significance level of 0.05, there was a significant difference between the two groups in terms of the average levels of assessment of price button, screenshots, compatibility, and purchase intention. Consumers who purchased fewer games in the past six months perceived a more expensive price button than those who purchased more games. They also were more likely to assess screenshots higher

than those consumers who purchased more games. However, consumers who purchased more than two games in the past six months were more likely to assess game compatibility information higher than those consumers who purchased fewer games. They also had higher purchase intention compared to consumers who purchased fewer games.

Table 5 Comparison of Respondents' Assessment of Visual Elements Classified by Purchased Apps

	Purchased Apps	N	T-test	Sig.	Std. Deviation	Mean	Level
App icon	Group1	220	-1.405	0.161	.76030	3.6848	High
	Group2	180			.66725	3.7852	High
App name	Group1	220	-1.297	0.195	.77721	3.2852	Moderate
	Group2	180			.75133	3.3847	Moderate
Price button	Group1	220	4.500**	0.000	1.138	2.65	Moderate
	Group2	180			1.028	2.17	Low
Screenshots	Group1	220	3.380**	0.001	.64337	3.8477	High
	Group2	180			.66565	3.6250	High
Description	Group1	220	-1.309	0.191	.79717	3.5152	High
	Group2	180			.72366	3.6148	High
Compatibility	Group1	220	-2.672**	0.009	.68599	4.3705	Very High
	Group2	180			.53273	4.5333	Very High
Developer info	Group1	220	-0.258	0.796	1.03063	2.5341	Low
	Group2	180			1.04895	2.5611	Low
Purchase intention	Group1	220	-2.534*	0.012	1.03194	2.8788	Moderate
	Group2	180			1.03869	3.1426	Moderate

* $p < 0.05$, two-tailed. ** $p < 0.01$, two tailed.

Conclusion and Managerial Implications

Visual elements were major sources that could influence purchase intention. The findings of this study indicated that six visual elements that could influence customers to buy new game applications include an app icon, a name of the app, a price button, screenshots, a description page, and developer information. The major findings of this study were consistent with the previous studies by Ayalew (2011), Shao-Kang (2008) and Kim (2012). However, the visual element of compatibility information was not significantly related to purchase intention. Most consumers might not pay attention to compatibility and thought that there should be no problem. The researchers found that 91.5% of the respondents perceived that the Rabbids Big Bang game app was compatible with their smartphones; therefore, the visual element of compatibility did not matter in purchase intention.

Based on the research results, many respondents agreed that they wanted to purchase Rabbids Big Bang app because they had positive attitude toward the app icon, consistent with the finding of Ayalew (2011). They believed that the icon looked colorful and the character appearing in the icon looked playful. Therefore, the app icon should present colorful and playful character to

grasp visitors' attention and influence them to review the game and make a purchase decision. Next, a positive attitude toward the name of the game app is important. If the name sounds exciting, the consumers may feel good and excited with the game, leading to purchase intention. Thirdly, a price button was also an important factor to consider because if the consumers perceive that the price is too expensive, they are less likely to purchase the game app. Moreover, consumers who have more experience in purchasing game apps tend to perceive that the price is cheaper compared with the people who have bought fewer game apps. Fourthly, well-designed screenshots can stimulate interest and excitement leading to purchase intention. The potential customers who have less experience in purchasing games are more likely to pay attention to the screenshots of the game and rate them higher than those who have purchased more games. Therefore, the characteristics of the screenshots should include beautiful and well-design background, exciting tag words, and good-looking game characters. Fifthly, the first paragraph of the description page of the game app can also make the consumers interested to purchase the app. The description page should involve imaginative description and benefits. Finally, the reputation of the game developer can also motivate the consumers to purchase the game app (Kim, 2012). Consumers who have seen some of the company's advertisements and the rating of the company's previous games or experienced playing other game apps by the developer are more likely to purchase the new game. According to the results of this study, male respondents were more likely to pay attention to the reputation of the game developer and rate the developer information higher than female respondents. The results of this study show that the game developer's reputation is an important factor. Customers can recognize reputation when they see high rating of the developer's previous game apps and they perceive higher trust if they have already experienced playing the developer's previous apps.

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