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## MOBILE APP USAGE AND ITS IMPLICATIONS ON CONSUMER BEHAVIOR TOWARD CONSUMER GOODS

DOI: 10.21008/j.0239-9415.2019.080.18

This study attempts to examine the influence of mobile apps on customers' attitude and finally customers' actual use behavior toward consumer goods. By applying the theory of mobile marketing and mobile commerce, the authors investigated the antecedents and the consequences of mobile apps to conclude about their implications in marketing. Variables, namely financial value, convenience value and fit of information are proven to have a positive impact on perceived usefulness; app design, ease of understanding and intuitive handling positively affect the perceived ease of use. Perceived variables including usefulness and ease of use have a positive influence on a consumer's attitude. Finally, purchase intention and sharing intention, followed by actual use behavior are as a consequence in the conceptual model.

**Keywords:** mobile apps, attitude, actual use behavior, consumer behavior, mobile marketing and mobile commerce

### 1. INTRODUCTION

Currently, three types of screens are increasingly popular to people, namely televisions, personal computers and mobile devices. The powerful development of technologies in the field of mobile communications such as mobile devices, 3G and 4G technology increase the position in the world of the third type of screen (the mobile screen), accounting for a large share of screen time compared to TV and computer. Mobile device technology has changed rapidly since the advent of the smartphone almost a decade ago with the high demand due to its functions and popularity such as instant messaging, downloading mobile apps, connecting to Wi-Fi and viewing

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entertainment programs (Poushter, 2016). The number of Internet users and the number of sites in Poland has grown steadily, and technical resources for the Internet connection are constantly expanding. Particularly, a report from 2015 said that 63% of the population in Poland has access to broadband internet with 40% of the population (nearly 16 million people) accessing websites using mobile devices (Polak, 2015). Additionally, over two billion mobile device users make some form of mobile commerce transaction and 95% of mobile internet users look up local information for the purpose of calling or visiting a business (Shukairy, 2017).

The most rapid development of mobile device technology is mobile apps which offer new smart features for a multitude of different activities, such as looking for local information, searching the web, researching products and services, or making actual purchases. In a report from the year 2015, Polak pointed out that in 2014, 46% of Polish smartphone users had accessed mobile apps and expected it to rise by 14% in 2015. Therefore, it led to the demand for the development of mobile apps primarily by FMCG and pharmaceutical sectors for the purpose of mobile commerce or marketing commerce not only globally but also in Poland.

As companies realize the increasing importance of communicating with consumers, especially toward consumer good, new opportunities like using mobile apps to facilitate consumer buying are providing excellent low-cost solutions for better relationship management. The mobile device has become a ubiquitous tool that empowers the customer who can with a few simple clicks become a quick source of revenue for a company. Mobile apps allow consumers to get newest promotion information, search for products, categories and brands, and make comparisons and place orders using their mobile device. This trend has grown rapidly and consumer usage of apps has grown by over 100% in the last few years. In addition to global apps, in Poland, there are some popular mobile apps created by Polish companies which aggregate coupons, flyers, promo codes and other deals from hundreds of restaurants, pharmacies or local and global retail companies. Therefore, it now makes sense for these Polish companies to ensure that their offerings are synchronized with the mobile apps.

The aim of this research is to explore the concept of experiential value and its influence on the usage attitude towards mobile apps of users concerning consumer goods in Poland.

## **2. LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT**

### **2.1. Mobile apps in Poland**

Mobile applications (or mobile apps) are software applications having both web-based and mobile-based characteristics, which run on a mobile device consisting of a smart phone, tablet and so on. Mobile apps have an operating system that

supports standalone software which is available through application distribution platforms, typically operated by the owner of the mobile operating system. Until March 2017, the two leading app stores in the world, including Google Play Stores and Apple's app store have 2.8 and 2.2 million available apps, respectively. This number is expected to increase rapidly in the future (Statista, 2017; Saifi, 2017).

Along with the growth of mobile apps around the world, mobile platforms and apps are the most dynamic developing trend in Poland. By 2018, employment in all mobile apps occupations is expected to be about 5 million people with 64 billion euro of revenue generated in the European Union (Poznan, 2016). The way of using networks now is changing in Poland, for instance, instead of adopting the classic public web site with a browser, Polish people are now more familiar with the use of apps. This makes Polish developers introduce more and more innovative solutions to the market every day, especially in the field of banking, advertising within the application or freemium model in order to maximize revenue. In terms of services, mobile apps also gained popularity in aspects including the purchase of newspapers, books and music, public transport tickets and parking services, maps and navigation or booking airline tickets. The report published in Poznan in 2016 also mentioned that among smartphone and mobile device users, each of them has an average of 17 installed applications and 8 of them were used within the last 30 days. With the 10 most frequently downloaded Polish mobile apps surveyed, the statistics presented that all of them have been downloaded at least millions of times. Therefore, it is obvious to say that the number of mobile application users in Poland is much bigger day by day.

## **2.2. Relationship between mobile apps usage, mobile commerce and mobile marketing**

Traditionally, retailers at first introduced ecommerce websites with the existence of numerous well-known brands existing on the market as the marketing strategy. As mentioned above, the number of smartphone and mobile device users is expected to continuously grow in the world and in Poland while at the same time consumers' willingness to use mobile apps for the purpose of mobile commerce is experiencing rapid growth (Criteo, 2016). Due to such an increase in the number of mobile device users and the willingness to adopt mobile commerce, marketers are increasingly using mobile apps to meet the demands of such consumers (Shankar et al., 2016). The retailers and enterprises are allocating large percentages of their marketing budget in order to enhance the customer experience through mobile apps (Versaw, 2017). However, due to rapidly changing mobile devices, consumers are now faced with a different interface and size of device to interact with. The interface change may subsequently change the response of consumers using and viewing content with a different set of variables influencing the customer experience.

Therefore, mobile apps can be seen as an important part of m-commerce, yet we have little understanding of what influences the customer experience during the use of m-commerce mobile apps.

From a marketing perspective, apps are being utilized as efficient marketing channels in terms of offering not only information but also search and communication services (Kim, Lin, Sung, 2013). This helps apps bring both functional value and hedonic value, entertainment, pleasure, and even consumer satisfaction, resulting in brand exposure and improved brand image. Hence, enterprises and marketers are continuously developing new apps that satisfy the needs of smartphone users while simultaneously promoting corporate branding. It takes them time and money to perform research to discover which aspects of mobile apps have a positive impact on users. Recent points of interest in mobile apps are the types of content and how this content can be delivered to the consumer effectively. Some companies are promoting their apps using innovative service as a marketing tool through innovative content or the use of new technology or even virtual reality techniques to attract consumers. Hence, the attitude toward apps is important to gain competitive advantage in creating business opportunities in the marketplace (Nasco et al., 2008).

This paper however, aims to add to our theoretical understanding of mobile applications through exploring the variables capable of influencing the customer experience during the use of selected Polish mobile apps. These apps are an example of mobile marketing and mobile commerce, which provide solutions such as aggregating coupons, flyers, promo codes and other deals from hundreds of restaurants, pharmacies or local and global retail companies. Mobile apps offer consumers an alternative channel for browsing and shopping and are unique in terms of the functions they can offer consumers and retailers; hence understanding the variables that influence the customer's experience is of significant value (Wang, Malthouse, Krishnamurti, 2015).

### **2.3. Research model and hypotheses development**

There are various research models introduced to explain computer use behavior, including the theory of reasoned action (TRA), theory of Planned Behavior (TPB) by Ajzen (1991), Technology Acceptance Model (TAM) by Davis (1986) and Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). Behavioral intention is jointly determined by TAM which is one of the first and the most influential research models to explain IT adoption behavior of users (Davis, Bagozzi, Warshaw, 1989; Davis, 1986). TAM has been known as a useful model of technology acceptance behaviors in a variety of IT contexts, and has been currently widely applied in many studies on information systems. The validity of the TAM has been proved consistently by several follow-up studies.

Overall, the above mentioned theoretical models have contributed to the understanding of user acceptance factors and behavior. However, there is still a need for further studies in mobile apps usage behavior. The extension of TAM serves the purpose of this research. The perceived user's perception is affected by three factors including financial value, convenience value and fit of information. To investigate perceived ease of use in detail, three factors – app design, ease of understanding and intuitive handling – were identified. The relationship between perceived usefulness (PU) and perceived ease of use (PEU) with the attitude toward using mobile apps was examined. In addition, the connection between attitude and intentions, including purchase intention and sharing, was also investigated. Along with actual use behavior, the impact of purchase and sharing intention on actual use behavior was analyzed. All are demonstrated clearly in the conceptual model (Fig. 1). A detailed discussion of each category along with its constructs is presented below.

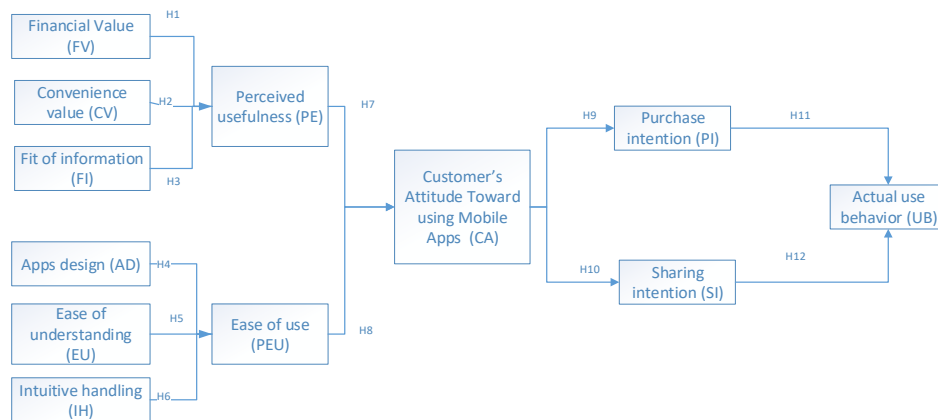


Fig. 1. Conceptual model. Authors elaboration

### 2.3.1. Financial value

There are many researchers who recognized the various benefit and sacrifice components of financial value based on a specific situation. For instance, the research of Huber and his coworkers in 2001 stated that when purchasing a product, a consumer considers sacrifices such as financial, time and emotional costs as well as perceptive effort which is accompanied by financial, social and psychological risk (Huber, Herrmann, Morgan, 2001). Therefore, the common view is that Financial Value is a ratio of total benefits to total costs. Perceived monetary savings are also defined as a perception of the consumer in terms of economic savings from using mobile coupon applications (Liu et al., 2015). Obviously a high face value coupon is more likely to be redeemed because consumers are able to save more

money from it. Although mobile coupon applications were introduced for the purpose of providing various coupons to consumers to reduce their consumption expenditures, the consumers may recognize a low value and not redeem the coupons if the financial returns of these coupons are small. Therefore, it is necessary to test the first hypothesis below in order to understand whether Financial value is one of the factor affecting Perceived Usefulness when the consumer is using mobile apps.

**H1: Financial value has a positive effect on perceived usefulness.**

### 2.3.2. Convenience value

Recently, research has supported the importance of convenience as a driver of satisfaction with self-service technology and the influence of convenience on the usage of self-service technology (Collier, Sherrell, 2010). Combining with the theories in self-service technology, researchers redefined the concept of convenience to adapt to the mobile context. Hence, convenience in consumers' perceptions is to use technology to finish work at a convenient time, in a convenient place, and in a convenient way (Yoon, Kim, 2007). In terms of mobile coupon apps, recent research suggests that convenience value is to free consumers from the burden of collecting, carrying, and printing coupons, and to enable consumers to search and obtain coupons easily, anytime and anywhere. In order to confirm the importance of convenience value in mobile apps usage the current study proposes the hypothesis below to examine the influence of convenience value on Perceived Usefulness.

**H2: Convenience value has a positive effect on perceived usefulness.**

### 2.3.3. Fit of information

Fit of information, also known as information quality, refers to how well the information offered in the self-service technology fits to what the service company wants the customers to do by themselves. Such information related to mobile apps was mentioned in the study of mobile apps-based banking technology, which suggested that information quality had a significantly positive effect on the intention to participate the apps (Noh, Lee, 2015). As to the e-commerce system, information quality measures used in recent e-commerce studies include accuracy, relevance, understandability, completeness, currency, dynamism, personalization, and variety, which has a critical dimension of the success measurement construct (D'Ambra, Rice, 2001). Combining all the information above, it is worth to propose the following hypothesis in order to confirm the relationship between fit of information and Perceived Usefulness.

**H3: Fit of information has a positive effect on perceived usefulness.**

### 2.3.4. App design

App design is one of the key themes of perceived ease of use which is defined as the degree to which a person believes that using a particular system would be free of effort (Schmitz, Bartsch, Meyer, 2016). As for the recent studies on mobile commerce aspects, they concluded that aesthetics, along with usability, is part of designing an overall enjoyable user experience with mobile devices, particularly the perceived attractiveness of the website such as site layout or color which influence ease of use (Heijden, 2003). In the investigations by Cyr and his coworkers, they examined visual aesthetics in a variety of situations, and applied the work in the specific context of the mobile device. The results showed that the perceived visual aesthetics of the mobile interface impact user perceptions of using easily the mobile device (Cyr, Head, Ivanov, 2006). Therefore, the following hypotheses were tested to confirm such an association in the situation of our chosen mobile apps.

**H4: App design has a positive effect on mobile apps' perceived ease of use.**

### 2.3.5. Ease of understanding

Ease of understanding is characterized not only by fragile knowledge of the core meaning of individual words, but also by fragile semantic connections between words, with serious implications for understanding and using language in a nuanced, context sensitive, and flexible manner (Sheng, McGregor, 2010). Ease of understanding was mentioned in the qualitative research and has also been identified by prior research employing the TAM, which stated that the apps should be easily structured and have basic functions that are easily understandable (Loiacono, Watson, Goodhue, 2007). Therefore, it is clear that ease of understanding in the structure of a system, its functions, interface, and contents are observed by the customer. This information gives rise to the idea of a hypothesis related to the influence of ease of understanding on Perceived Ease of Use.

**H5: Ease of understanding has a positive effect on perceived ease of use.**

### 2.3.6. Intuitive handling

Intuitive handling is also known as an app's "ease of operation" mentioned in the qualitative research and has been identified by prior studies using the TAM (Loiacono, Watson, Goodhue, 2007). Ease of operation refers to the degree to which an individual feels that using a system would require little or no effort (Hernandez, Jimenez, Martin, 2008; Davis, Bagozzi, Warshaw, 1989). The study in 2014 discussed the ease of operation of using an innovation as an innovation-attribute, which revealed that compatibility and self-efficacy as the antecedents to ease of operation (Kapoor, Dwivedi, Williams, 2014). In order to examine the im-

pact of such intuitive handling (ease of operation) on ease of use, the hypothesis below was proposed.

**H6: Intuitive handling has a positive effect on ease of use.**

### 2.3.7. Perceived usefulness

Perceived usefulness refers to the extent to which users believe that using a particular technology will enhance their performance and therefore captures the instrumentality or rational component of their usage decision (Davis, Bagozzi, Warshaw, 1989). To assess perceived usefulness, the following features should be evaluated: improved productivity, quicker transactions, usefulness for the customer, transaction effectiveness and improved effectiveness of the activity (Nugroho, 2009). As the value of the coupons increases, consumers' evaluations of the coupon become more positive. Mobile coupons are particularly aimed at providing consumers economic benefits, for instance discounts at the moment of redemption. Consequently, a positive relationship between economic benefits and the attitude toward mobile coupons was confirmed (Dickinger, Kleijnen, 2008; Dawei, Weiwei, 2017). Hence, the focus is on the effect of Perceived Usefulness on the behavior of users when using chosen mobile apps in order to compare with previous studies, with the hypothesis:

**H7: Perceived usefulness has a positive effect on a customer's attitude toward using mobile apps.**

### 2.3.8. Perceived ease of use

Perceived ease of use was defined by Davis (1986) as the degree to which a person believes that using the system will be free from effort and has been subsequently expanded upon by many researchers. In order to assess perceived ease of use, the following features should be evaluated: time of operation, ease of operation, ease of remembering operation, operation according to how the user desires, flexible in operation, and easy to become skillful (Pavlou, 2003). In 2008, Karjaluoto and co-workers demonstrated how perceived ease of use affects attitudes toward mobile advertising; however, in 2010 the research of Soroa-koury and Yang argued that the perception of ease of use does not predict attitudes toward mobile advertising (Karjaluoto et al., 2008). This led to contradictory results in prior literature related to perceptions of ease of use as an antecedent of consumers' attitudes toward mobile advertising. In accordance with TAM literature, the following hypothesis is proposed to examine how Perceived Ease of Use affects a customer's attitude toward using mobile apps.

**H8: Perceived ease of use has a positive effect on a customer's attitude toward using mobile apps.**



### 2.3.9. Consumer's attitude toward using mobile apps

Attitude is critical for explaining human behaviors, which defines attitude as a learned predisposition of human beings leading them to respond 'to an object, idea or opinion' (Richard, Chandra, 2005). With reference to the determinants of attitudes towards mobile advertising, they found the value or benefit of mobile advertising and perceived interactivity as antecedents of attitudes and intentions to purchase (Dickinger, Kleijnen, 2008). This is considered an important aspect related to economic benefits on mobile apps. Hence, this study has divided the behavioral intention into two separate aspects, including purchase intention and sharing intention.

The first hypothesis conducted to understand consumer behavior is focused on the cognitive system to predict the journey of customer behavior. It investigated the relation between attitude toward mobile apps and the intention to purchase the product. Clearly, in this research, buying/purchasing intention is the consequence of a favorable attitude towards a product or service (Peter, Olson, 2010). In a similar vein, several researchers have presented evidence of the direct influence of attitude towards purchase intention (Liu et al., 2015).

**H9: A customer's positive attitude toward using mobile apps has a positive effect on purchase intention.**

The second hypothesis is to examine the association between attitude toward mobile apps and the intent to share information or to use such an app. To be more specific, the integration of Web 3.0 as a means of social media facilitates electronic word-of-mouth (eWOM) exchange, which is defined as either a positive or negative response/statement of users related to products, services, and brands on the Internet (Hennig-Thurau et al., 2004). Additionally, eWOM was confirmed to play a significant role as a consequence of users' attitude online since social media allowed individuals to seek, transmit, and share their views and ideas (Dawei, Weiwei, 2017). Therefore, it is worth to propose the following hypothesis.

**H10: A customer's positive attitude toward using mobile apps has a positive effect on sharing intention.**

### 2.3.10. Behavioral intention and actual use behavior

Behavioral intention is one of the core measures for acceptance, serving as an antecedent which is measured or taken into account in technology acceptance studies (Davis, Bagozzi, Warshaw, 1989). Particularly, attitude is a significant predictor of intent to use in two related behaviors, including purchasing and information-sharing activities (Taylor, Levin, 2014). The former includes the activities related to engaging in a purchase transaction such as receiving discount coupons or shopping/purchasing items. The latter refers to more search related behavior like sharing videos, photos or information of products. The role of behavioral intention is

seen as the key predictor of actual technology usage (Davis, Bagozzi, Warshaw, 1989).

The apps stickiness refers to the user's behavioral intention to reuse and prolong the duration of each usage on an app, leading to the potential of purchase intention toward products. Such an intention is defined as the degree to which a user would like to purchase products and/or services in the future (Hsua, Linb, 2016). The effect of PI on UB is moderated by the amount of time elapsed since the consumer's last visit to retail stores (Taylor, Levin, 2014). Obviously, consumers who have visited a retailer more frequently and/or more recently are likely to maintain higher levels of both product category involvement and commitment to the retailers or shops. This leads them to engage in purchasing activities, resulting in an actual purchase. A relationship between a consumer's product involvement and acceptance of mobile advertising and marketing communications includes the information-sharing activities (Mort, Drennan, 2007; Liu et al., 2015). Customers engage in word of mouth activities related to actual behavior of sharing (Brown, Broderick, Lee, 2007). Since this research strives to examine the effect of PI and SI on actual use behavior, it is worth to propose the following hypotheses.

**H11: Purchase intention has a positive effect on actual use behavior.**

**H12: Sharing intention has a positive effect on actual use behavior.**

### 3. RESEARCH METHODOLOGY

#### 3.1. Research approach

Based on the theory of research design, triangulation should use both quantitative and qualitative methodologies which combine several different methods and research tools. However this research used only quantitative research and the deductive approach with the aim of testing the effect of mobile applications on consumer behavior toward consumer goods. The quantitative method led to the construction of the conceptual model to run a test on the relationships between variables. It is acceptable and appropriate to adopt the quantitative research for this kind of research, which emphasizes quantification in the collection and analysis of data (Johnson, Christensen, 2012). The quantitative study is used to summarize and generalize the hypotheses tested that derived from the theory. Primary data is collected via current usage attitudes among the consumer groups who are using mobile apps via mobile devices. In order to construct questionnaires, all variables are collected from previous studies in different contexts. The results obtained from this method are frequently expressed in statistical forms. Table 1 below presents the items used in this study.

Table 1. Research items

Factors	Items		Source
1	2		3
<b>Financial value</b>	FV1	The apps can save me a lot of money	Liu et al., 2015
	FV2	Using the apps, I spend less	
	FV3	The apps enable me to shop at a lower financial cost	
<b>Convenience value</b>	CV1	Using the apps enables me to use coupons at any time	Liu et al., 2015
	CV2	Using the apps enables me to use coupons in any place	
	CV3	Using the apps gives me convenience to compare goods/services of different brands	
	CV4	Using the apps gives me convenience to find the needed coupon	
<b>Fit of information</b>	FI1	The apps provide valuable information to me	Loiacono, Watson, Goodhue, 2007; Noh, Lee, 2015
	FI2	The apps provide accurate information to me	
	FI3	The apps provide relevant information to me	
<b>App design</b>	AD1	The screen design (color, menus, etc.) is attractive	Loiacono, Watson, Goodhue, 2007; Cyr, Head, Ivanov, 2006
	AD2	The apps' layout serves my purposes	
	AD3	The apps looks professionally designed	
	AD4	The apps display visually pleasing design with meaningful graphics	
<b>Ease of understanding</b>	EU1	The display pages within the apps are easy to read	Loiacono, Watson, Goodhue, 2007
	EU2	The text on the apps is easy to read	
	EU3	The app helps me to view information on goods/service in both text and graphic form for better understanding	
<b>Intuitive handling</b>	IH1	Learning to operate the app is easy for me	Loiacono, Watson, Goodhue, 2007
	IH2	It would be easy for me to become skillful at using the apps	
	IH3	I find the apps easy to use	
<b>Perceived usefulness</b>	PU1	Using the app would enable me to get information quickly	Dawei, Weiwei, 2017
	PU2	I would find the app useful in my daily life	
	PU3	The apps will make me more efficient while shopping	
<b>Perceived ease of use</b>	PEU1	I find it easy to connect and get the app without requiring a lot of mental effort	Cyr, Head, Ivanov, 2006
	PEU2	I find this app to be very easy to use	
	PEU3	I find the app to be flexible to interact with	

Table 1 continue

1	2		3
<b>Consumer's attitude toward using mobile apps</b>	CA1	Using the apps is a good idea	Noh, Lee, 2015; Davis, Bagozzi, Warshaw, 1989
	CA2	Using the app is wise	
	CA3	Using the apps is beneficial	
<b>Purchase intention</b>	PI1	After seeing the information shown in the apps, I intend to purchase the promoted products in the near future	Liu et al., 2015
	PI2	After seeing the information shown in the apps, I intend to visit the shop in the near future	
	PI3	I am willing to purchase a product by using a coupon from the apps if I find something I like	
<b>Sharing intention</b>	SI1	I am willing say positive things about the apps to other people	Dawei, Weiwei, 2017
	SI2	I am willing recommend the apps to other people	
	SI3	I am willing to share information about products in the app to other people	
<b>Actual use behavior</b>	UB1	I rarely use the information in the apps to purchase promoted products	Tak, Panwar, 2017
	UB2	I sometimes use the information in the apps to purchase promoted products	
	UB3	I regularly use the information in the apps to purchase promoted products	
	UB4	I always use the information in the apps to purchase promoted products	
	UB5	I often share the information about purchase promoted products to people	
	UB6	I do not share the information with anyone	

Authors elaboration.

To avoid problems such as respondents skipping a series of questions due to misunderstanding or misinterpreting the instructions when filling out the questionnaire, a pilot was conducted face to face with a small group of 5 Polish and international students to find out their responses toward the content and information of the survey. It took a maximum of 10 minutes to read and complete the whole survey. Some Polish and English grammatical errors were found and modified. A full scale survey was distributed immediately after receiving feedback from the pilot test, providing 836 valid surveys.

### **3.2. Data Collection**

A combination of judgment and non-profitability sampling was adopted in the data collection process. Precisely, the questionnaire was published in Google Form for the convenience of respondents, among whom the targeted participants are those who have used particular mobile apps selected by the researcher such as Okazjum, Blix, Moja Gazetka, Tropiciel Okazji or Qpony. The researcher also posted the survey on social media tools such as Facebook groups of both a Polish group and an international group based in Poznan, and a student forum based in Poznan (with the permission of administrators) in order to ensure the quality of received data. It took about 2 months to collect respondents.

### **3.3. Data analysis technique**

As the study adopts quantitative methodology, the statistical Program SPSS (Statistical Package for the Social Science version 2) is used to examine the relationship among variables by analyzing several indexes (Johnson, Christensen, 2012). Descriptive analysis, scale measurement (reliability and validity tests) and inferential analysis (multiple regression analysis) are carried out in the data analysis part. As a result, an analysis will be presented about the relationship of the tested hypotheses in detail.

## **4. DATA ANALYSIS & RESULT**

### **4.1. Reliability and validity**

In order to enhance the accuracy of assessment and evaluation of a quantitative study, reliability and validity are important concepts to be used in most studies (Tavakol, Dennick, 2011). Cronbach's Alpha ( $\alpha$ ) is used for testing the reliability factor and exploratory factor analysis (EFA) is used to examine the validity of items.

As a result, in this study, the researcher only accepts  $\alpha$  in the range between 0.6 and 0.9 as the study is on newly developed measures. In terms of the validity test, Exploration Factor Loading (EFA) is applied. Factor loading is a criterion to ensure significant level of EFA with the acceptable validity should be more than 0.5 to confirm the correlation (Pallant, 2013). Thus, the reliability and validity of the results is confirmed and further research can be continued.

Table 2. Factor loading of Items

Factors	Items	Factor Loading	Cronbach's Alpha
Financial value	FV1	0.888	0.780
	FV2	0.877	
	FV3	0.738	
Convenience value	CV1	0.817	0.732
	CV2	0.737	
	CV3	0.736	
	CV4	0.690	
Fit of information	FI1	0.864	0.802
	FI2	0.863	
	FI3	0.814	
App design	AD1	0.898	0.845
	AD2	0.865	
	AD3	0.854	
	AD4	0.681	
Ease of understanding	EU1	0.897	0.819
	EU2	0.894	
Intuitive handling	IH1	0.894	0.861
	IH2	0.882	
	IH3	0.878	
Perceived usefulness	PU1	0.825	0.707
	PU2	0.795	
	PU3	0.773	
Perceived ease of use	PEU1	0.869	0.733
	PEU2	0.827	
	PEU3	0.719	
Consumer's attitude toward using mobile apps	CA1	0.868	0.822
	CA2	0.860	
	CA3	0.854	
Purchase intention	PI1	0.913	0.787
	PI2	0.883	
	PI3	0.709	
Sharing intention	SI1	0.883	0.781
	SI2	0.870	
	SI3	0.756	
Actual use behavior	UB3	0.860	0.763
	UB4	0.819	
	UB5	0.761	

Authors elaboration.

## 4.2. Correlation analysis

Based on some recent research, the correlation analysis was conducted to examine the intensity and tendency of the variables' relationships, and the "one-tailed bivariate" correlation was implemented as the direct hypothesis (Field, 2013; Pallant, 2013)

Table 3. Summary Correlation results between variables

Hypothesis	Variables	Abbreviations	Pearson Correlation	Sig at 0.01 (1-tail)
H1	Financial Value and Perceived Usefulness	FV and PU	0.433	<0.001
H2	Convenience Value and Perceived Usefulness	CV and PU	0.462	<0.001
H3	Fit of Information and Perceived Usefulness	FI and PU	0.534	<0.001
H4	App design and Perceived Ease of Use	AD and PEU	0.448	<0.001
H5	Ease of Understanding and Perceived ease of Use	EU and PEU	0.542	<0.001
H6	Intuitive Handling and Perceived ease of Use	IH and PEU	0.800	<0.001
H7	Perceived Usefulness and Customer Attitude	PU and CA	0.706	<0.001
H8	Perceived ease of use and Customer Attitude	PEU and CA	0.503	<0.001
H9	Customer Attitude and Purchase Intention	CA and PI	0.550	<0.001
H10	Customer Attitude and Sharing Intention	CA and SI	0.519	<0.001
H11	Purchase Intention and Actual use Behavior	PI and UB	0.337	<0.001
H12	Sharing Intention and Actual use Behavior	SI and UB	0.353	<0.001

Authors elaboration.

In relation to Table 3, among relations between factors, it is clear to say that just IH has a very strong correlation with PEU as its correlation number is 0.8 at the confidence level of 99%. The value of 0.706 shows “strong” correlation between PU and CA with its correlation number within the range of 0.6–0.79. As for “moderate” correlation within the range of 0.4–0.59, there are FV and PU at 0.433, CV and PU at 0.462, FI and PU at 0.534, AD and PEU at 0.448, EU and PEU at 0.542, PEU and CA at 0.503, CA and PI at 0.55, CA and SI at 0.59. Finally, there is a weak correlation between PI and UB as well as SI and UB with the value of 0.337 and 0.353, respectively. These results point out that, most of correlation in this study is moderate.

### 4.3. Hypothesis testing

In previous parts, the reliability and validity were confirmed; yet, the correlation test cannot examine the relationship between tested variables. Therefore, another

test should be performed to model the relationship between each two variables by fitting a linear equation to the observed data. The conducted test is linear regression analysis (Hair et al., 2010; Pallant, 2013). Element factors should be examined in this test including “adjusted  $R$  Square”, sig of  $F$ -test, Durbin-Watson (DW) value,  $t$ -statistic.

Table 4. Hypothesis testing results

Output		<i>Beta</i>	<i>t</i> -statistic	<i>F</i> -ratio	Adjusted $R^2$	Durbin-Watson
PU as dependent variable	<b>Model 1</b>	.433	7.801	60.856	.185	1.857
	<b>Model 2</b>	.462	8.455	71.494	.211	1.880
	<b>Model 3</b>	.534	10.244	104.948	.283	1.710
PEU as dependent variable	<b>Model 4</b>	.448	8.132	66.134	.198	2.246
	<b>Model 5</b>	.542	10.471	109.645	.292	2.293
	<b>Model 6</b>	.800	21.606	466.816	.638	2.269
CA as dependent variable	<b>Model 7</b>	.706	16.152	260.877	.496	2.131
	<b>Model 8</b>	.503	9.427	88.864	.250	1.912
CA as independent variable	<b>Model 9</b>	.550	10.671	113.864	.299	2.052
	<b>Model 10</b>	.519	9.850	97.025	.267	1.816
UB as dependent variable	<b>Model 11</b>	.337	5.798	33.613	.110	1.206
	<b>Model 12</b>	.353	6.127	37.534	.122	1.214
with $p < 0.001$ in ANOVA table						

Authors elaboration.

As can be seen in the table, from model 1 to model 10, the Durbin Watson test is represented with a value from 1.7 to 1.29, indicating that test statistic values are relatively normal. Besides that, although model 11 and model 12 have a value less than 1.5 but there are still higher than 1, hence, the value can be seen as positive autocorrelation.

**H1: Financial value has a positive effect on perceived usefulness.**

Firstly, model 1 aims to explore the impact of financial value (FV) on mobile apps' perceived usefulness. From the outcome Table 4, the FV has  $Beta = 0.433$ ,  $t$ -value = 7.801 and  $p < 0.001$ , Furthermore, adjusted  $R$  square is 0.185 which means the addition of independent variable FV into a regression model explained 18.5% of the variability of dependent variable PU, showing weak level of association. Also the  $F$  ratio = 60.856 shows that the model is well predicted. As a result, H1 is accepted.

**H2: Convenience value has a positive effect on perceived usefulness.**



Model 2 is constructed to examine the influence of convenience value (CV) on mobile apps' perceived usefulness (PU). It has  $Beta = 0.462$ ,  $t$ -statistic = 8.455 and a significance  $p < 0.001$ . This means that the CV has a positive influence on PU. Additionally, the adjusted  $R^2 = 0.211$ , CV accounted for 21.1% variance in PU. Hence, H2 is supported.

**H3: Fit of information significantly has a positive effect on perceived usefulness.**

Model 3 is performed to test the relationship between fit of information (FI) and mobile apps' perceived usefulness (PU). The results show the positively significant effect of FI on PU as the coefficient is positive,  $Beta = 0.534$  with  $t = 10.244$  ( $p < 0.001$ ). The adjusted  $R^2 = 0.283$  illustrates that the 28.3% variance in PU can be explained by FI. From the table, the  $F$ -ratio is 104.948 ( $p < 0.001$ ) will be a better prediction of PU. Thus, H3 is supported.

**H4: App design has a positive effect on perceived ease of use.**

In terms of model 4 from Table 4 this hypothesis tests the relationship of app design (AD) and mobile apps' perceived ease of use (PEU). To be specific, the coefficient is positive at 0.448 ( $t$ -value = 8.132,  $p < 0.001$ ) which shows the fairly positive impact of AD. Adjusted  $R^2 = .198$  shows that AD explains 22.46% of the variance in PEU. Hence, H4 is supported.

**H5: Ease of understanding has a positive effect on perceived ease of use.**

With regard to model 5, it is constructed to test the influence of ease of understanding on mobile apps' perceived ease of use (PEU). The  $R^2$  value (0.292) presents that EU accounted for 29.2% of the variance in mobile apps perceived ease of use and the model  $F$ -ratio = 109.645 with  $p < 0.001$  is a good predictor of PEU. Therefore, H5 is accepted.

**H6: Intuitive handling has a positive effect on perceived ease of use.**

Model 6 aims to explore the relationship between intuitive handling (IH) and mobile apps ease of use (EU). From data results in Table 4 the model 6 has  $Beta = 0.8$ ,  $t$ -value = 21.606 and  $p < 0.001$  with an adjusted  $R$  square of 0.638 which mean the addition of independent variable IH into a regression model explained 63.8% of the variability of dependent variable EU. This result indicates a very strong level of association between them. Also the  $F$  ratio = 466.816 shows that the model is very well predicted. As a result, H6 is accepted.

**H7: Perceived usefulness has a positive effect on a customer's attitude toward using mobile apps.**

Model 7 is created to observe the influence of mobile apps' perceived usefulness (PU) on a customer's attitude toward using mobile apps (CA). It has  $Beta = 0.706$ ,  $t$ -statistic = 16.152 and a significance  $p < 0.001$ , meaning that the PU has a strong positive effect on CA. Plus, the adjusted  $R^2 = 0.496$ , PU accounts for 49.6% variance in CA. Hence, H7 is supported.

**H8: Perceived ease of use has a positive effect on a customer's attitude toward using mobile apps.**

It is clear to say that model 8 is shown to examine the impact of mobile apps' perceived ease of use (PEU) on a customer's attitude toward using mobile apps (CA). The data results find the positively significant impact of PEU on CA as the coefficient is positive,  $Beta = 0.503$  with  $t = 9.427$  ( $p < 0.001$ ) and  $F$ -ratio = 88.864 ( $p < 0.001$ ). The adjusted  $R^2 = 0.250$  also proves that the 25% variance in PEU can be explained by CA. Thus, H8 is supported.

**H9: A customer's positive attitude toward using mobile apps has a positive effect on purchase intention.**

According to the hypothesis result in the table above, the hypothesis test of model 9 is about the relationship of a customer's attitude toward using mobile apps (CA) and purchase intention (PI). Obviously, the coefficient is positive at 0.55 ( $t$ -value = 10.671,  $p < 0.001$ ), leading to the fairly positive impact of CA. Moreover, adjusted  $R^2 = 0.299$  reveals that CA describes 22.46% of the variance in PI. Consequently, H9 is supported.

**H10: A customer's positive attitude toward using mobile apps has a positive effect on sharing intention.**

Table 4 describes model 10 on the influence of a customer's attitude toward using mobile apps (CA) on sharing intention (SI). The adjusted  $R^2$  value (0.267) displays that CA accounted for 26.7% of the variance in mobile apps' perceived ease of use with  $F$ -ratio = 97.025 with  $p < 0.001$  is a quite good predictor of SI. In addition  $t$ -value = 9.850 with  $Beta = 0.519$ , show a positive coefficient. Hence, H10 is accepted.

**H11: Purchase intention has a positive effect on actual use behavior.**

Model 11 tests the association between purchase intention (PI) and actual use behavior (UB). The adjusted  $R^2$  value (0.110) presents that PI attribute 11% of the variance in UB factor with model  $F$ -ratio = 33.613 with  $p < 0.001$ ,  $t$ -statistic = 5.798 and  $Beta = 0.337$ , indicating a weak relation between them. However, H11 is still accepted.

**H12: Sharing intention has a positive effect on actual use behavior.**

Finally, the data in model 12 explores the influence of the sharing intention (SI) factor on actual use behavior (UB) factor. As can be seen in Table 4 the SI has a  $Beta = 0.353$ ,  $t$ -value = 6.127 and  $p < 0.001$ ; and also with adjusted  $R$  square = 0.122 which points out that the addition of independent variable FV into a regression model explained 12.2% of the variability of dependent variable UB. However, it shows a weak level of association between them with  $F$ -ratio = 37.534. Consequently, H12 is still accepted.

## 5. DISCUSSION

### 5.1. Discussion of findings

User experience is central to the success of a technology product and service. Using mobile apps for getting offers, coupons, discounts and deals to drive revenue and customer loyalty is not an exception. Developing apps that provide a pleasant experience for users is of utmost importance for customer goods companies. The purpose of this study is to examine experience based cognitive factors that affect users' attitudes to use the apps toward consumer goods in Poland. Overall, hypothesis research model did a fairly good job explaining the positive association between the independent variable and dependent variable. All the hypotheses are accepted, which is consistent with all previous studies. All the variables have positive effects on the associated factors. All in all, the results of this study are compatible with previous research and provide a new application for mobile marketing and the mobile commerce context, especially on the Polish market.

### 5.2. Theoretical implication

This study enhances our understanding of how consumers' perceptions across different stages influence their usage behavior. This study extends the applicability of the expectancy confirmation model to explore the relationships among various factors with consumption experience and mobile app actual use behavior. Additionally, this study provides an in-depth understanding of the various factors underlying consumption experience and continuation usage of mobile apps as well as actual use behavior. The various factors examined here are financial value, convenience value, fit of information, app design, ease of understanding, intuitive handling, perceived usefulness, perceived ease of use, consumer's attitude, purchase intention, sharing intention. This study builds on the existing literature gaps by incorporating several technology acceptance models, especially TAM in order to explain the relationship between factors. The positive impact for all accepted hypotheses is believed to provide more insight toward the existing literature.

Obviously, the developed model has been tested for mobile apps usage in terms of mobile marketing and mobile commerce, it also provides insights for research in related fields. Above all, this work has implications for consumer adoption processes and consumer channel choice, as well as for online shopping/retailing, mobile commerce, or multi-channel-retailing and so on. For consumer adoption processes, this research broadens the understanding of the psychological mechanisms underlying the formation of usefulness perceptions, ease of use perception, consumer's attitude and intentions as solid predictors of consumer adoption. For con-

sumer channel choice, this work emphasizes the need to distinguish between habits of shopping tasks to determine the predictors of channel choice appropriately.

### **5.3. Practical implication**

This research yields a number of potential practical applications in the development and use of mobile apps related to mobile marketing and mobile commerce. By confirming technology acceptance models, especially TAM, it suggests that mobile apps developers and marketers should provide as financial value, convenience value and fit of information of perceived usefulness and apps design, ease of understanding and intuitive handling of perceived ease of use for mobile apps to encourage people to reuse or revisit the apps. It also suggests specific factors and items that those developers might emphasize when they create new apps. The research has also provided instruments that could be useful to app developers in organizations that encourage the customer to use similar apps. The responses could be used to identify strengths and weaknesses in existing apps. Developers and marketers could investigate the factors and items with lower scores. The responses might thus be useful in improving those apps.

## **6. CONCLUSION**

### **6.1. Conclusion**

This study focused on consumer behavior in the acceptance of mobile applications related to mobile marketing and mobile commerce in Greater Poland, Poland. Based on prior research, this study provides empirical evidence on how perceived variables influence the attitude and intention to adopt mobile applications and followed by actual use behavior toward consumer goods, as well as how consumers perceive the value of mobile applications. It draws the conclusion that factors such as financial value, convenience value and fit of information have a positive effect on perceived usefulness. Other factors consisting of app design, ease of understanding and intuitive handling have a positive impact on perceived ease of use, in which intuitive handling has a very strong correlation to the perceived ease of use. In addition, the results suggest that perceived variables including usefulness and ease of use have a positive influence on consumer's attitude and the correlation between usefulness and attitude witnessed a strong level. The findings show that these factors and perceived variables play necessary roles in the technology acceptance model in this case study. Next, a conceptual model was presented, which points out that the favorable attitude towards mobile apps also generates the shar-

ing intention and purchase intention, followed by actual use behavior as a consequence. Consequently, mobile applications are suggested to be launched between the attention and integration phase in order to raise awareness of the customers, providing them with new information and knowledge about consumer goods in terms of coupons, deals and discounts. The outcomes are beneficial to mobile apps developers as well as marketers, as the results reflect the mind of the consumer.

## 6.2. Limitation

Like any quantitative research, the study has some limitations. First of all, beyond the theoretical perspectives included in this study, a relative lack of theory in relation to the phenomenon examined has of course limited the scope of the analyses, for example, the lack of complexity model as well as few studies related to similar mobile apps chosen in Poland. Secondly, the results have only been tested in Greater Poland. There is no empirical proof that the identified dimensions are also valid for other cities in Poland. The same is true for the outcomes that can be achieved by app usage.

With regard to the data used, while small-scale survey data on mobile apps user views are extensively drawn upon, behavioral data in the form of user time spent on such mobile apps or product purchase information is not examined. Indeed, the lack of such data is a major challenge in the research on mobile app usage to directly link actual use behavior of such apps to quantified retail outcomes to examine purchase frequency at retailers or shops. From a measurement perspective, a limitation of our approach is that some important issues have been examined by questions enabling the collection of online data only via Google forms, which cannot be sure about the reliable response. Finally, this research does not examine the moderating effects of gender. Other demographic/situational variables such as age, education, and experience may also be considered.

## 6.3. Further work

This study offers opportunities for future research. First, the research focused on the behavior of the mobile application user toward consumer goods, but the attitude of the enterprise remains unknown. Future research can examine the factors that influence enterprises' willingness to add their coupons, discounts or deals into such mobile applications. Second, the study focused on the function of mobile applications and did not consider their system quality. Future research can examine factors related to system quality, such as reliability and accessing speed. Third, the comparison between variables has not been examined yet, therefore, the most important factors effect on perceived value is unknown. Additionally, the effect of other ex-

ternal factors such as gender, age, education, experience, social norms on each factor has not been considered. Therefore, such examination could be conducted in a future study. Finally, since this study only focused on a narrow group of respondents in Greater Poland, a wider group of respondents is encouraged in other cities in Poland.

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**WYKORZYSTANIE APLIKACJI MOBILNYCH  
I ICH WPŁYW NA ZACHOWANIE KLIENTÓW PRZY NABYWANIU  
DÓBR KONSUMPCYJNYCH**

Streszczenie

W pracy zrelacjonowano próbę zbadania wpływu aplikacji mobilnych na nastawienie klienta i jego rzeczywiste zachowanie w odniesieniu do dóbr konsumpcyjnych. Zastosowano w niej teorię marketingu mobilnego i handlu mobilnego w celu zbadania możliwości i konsekwencji używania aplikacji mobilnych w obrębie grupy docelowej. Udowodniono, że pewne zmienne, a mianowicie wartość finansowa dóbr, wygoda dostępu do informacji i ich dopasowanie do oczekiwań klienta mają pozytywny wpływ na postrzeganą użyteczność aplikacji, a właściwe zaprojektowanie aplikacji, ich przyjazność i intuicyjna obsługa pozytywnie wpływają na łatwość użytkowania. Szczególnie ważne okazały się przydatność i łatwość użytkowania jako czynniki korzystnie oddziałujące na nastawienie konsumenta. Zamiar zakupu i gotowość do udostępniania w sieci informacji na ten temat, a także późniejsze rzeczywiste wykorzystanie aplikacji są zależne od czynników opisanych w koncepcji modelowego zachowania.

**Słowa kluczowe:** aplikacje mobilne, postawa, rzeczywiste użytkowanie, zachowania konsumentów, marketing mobilny i handel mobilny

