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An empirical study on the adoption of mobile location-based advertising

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Abstract

AN EMPIRICAL STUDY ON THE ADOPTION OF MOBILE LOCATION-BASED ADVERTISING

Increasing market penetration of smart phones and mobile broadband subscriptions has created new marketing communication avenues that allow interactive and highly targeted advertising based on individuals' location and contextual environment. However, the factors that guide consumers' adoption of such advertising and consumer perceptions of this new advertising channel are not yet fully understood. This research attempts to bridge this gap. Location-based services are smart phone applications that enable this avenue. The purpose of this study is to understand the factors that influence consumer acceptance and adoption of one specific type of location-based service – location-based advertising – where advertising messages are customized to individuals' location, personal information and interests. Drawing theories from the fields of technology adoption, social psychology, and mobile marketing, ten constructs are identified and a modified conceptual model and hypotheses are built and tested with survey data from 138 individuals. Structural equation modeling is used to test 10 factors that influence consumer adoption of location-based advertising: (1) attitude, (2) social influence, (3) perceived usefulness, (4) perceived ease of use, (5) perceived enjoyment, (6) compatibility (7) incentives, (8) personal innovativeness, (9) privacy issues, (10) Attitude toward advertising in general. The results indicate that enjoyment – as entertainment, fun, and interactive – is the strongest driver that influence individuals' attitude that in turn, is the strongest determinant of behavioral intention to adopt location-based advertising. A strong indirect influence of compatibility, perceived usefulness and incentives to adoption is also found. The relationship between privacy issues and personal innovativeness toward adoption are not statistically significant and therefore, their importance in guiding consumer adoption of location-based advertising cannot be determined based on this research.

Keywords: Mobile marketing, mobile advertising location-based services, location-based advertising, attitude, enjoyment, technology adoption, acceptance, structural equation modeling.

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Tiivistelmä

EMPIIRINEN TUTKIMUS SIJANTIIN PERUSTUVAN MOBIILIMAINONNAN KÄYTTÖNOTTOON VAIKUTTAVISTA TEKIJÖISTÄ

Älupuhelin- ja mobiililaajakaistamarkkinoiden kasvu on luonut uusia markkinointikommunikaation kanavia, jotka mahdollistavat interaktiivisen ja tarkasti räätälöidyn mainostamisen, joka ottaa huomioon käyttäjän maantieteellisen sijainnin ja kontekstuaalisen ympäristön. Siitä huolimatta, tekijät, jotka ohjaavat kuluttajien kyseisen mainonnankanavan omaksumista ja kuluttajien näkemyksiä mobiilimainonnasta, joka perustuu sijaintiin, ei ole vielä täysin ymmärretty tieteellissä yhteisössä. Tämä tutkimus pyrkii täyttämään tämän kuilu. Paikannuspalvelut ovat älypuhelinsovelluksia, jotka mahdollistavat interaktiivisen ja yksilöllisesti räätälöidyn mainonnan. Tämän tutkimuksen tarkoituksena on syventää ymmärrystä tekijöistä, jotka vaikuttavat kuluttajien päätöksentekoprosessiin paikannuspalveluiden käyttöönottoon liittyen. Tutkimus syventyy yhteen tiettyyn paikannuspalvelun sovellukseen – sijantiin perustavaan mobiilimainontaan – jossa mainosviestit räätälöidään kuluttajan tarkan sijainnin, henkilökohtaisten tietojen ja kiinnostusten mukaan. Pohjautuen innovaation diffusioteoriaan (innovation diffusion theory, IDT), teknologian omaksumismalliin (technology acceptance model, TAM) ja rationaalisen käyttäytymisen teoriaan (theory of reasoned action, TRA) sekä muihin niiden johdannaisiin, kymmenen tekijää valittiin ja käsitteellinen mukautettu malli ja hypoteesit rakennettiin, jotka testatiin käyttäen 139 vastaajan otantaa. Rakenneyhtälömallinnusta käytettiin sijaintiperustaisen mobiilimainonnan omaksumiseen vaikuttavien tekijöiden testaamiseen: (1) asenne, (2) sosiaalinen vaikute, (3) havaittu hyödyllisyys, (4) havaittu käytön helppous, (5) havaittu viihteellisyys, (6) yhteensopivuus, (7) rahallinen kannuste, (8) henkilökohtainen innovatiivisuus, (9) yksityisyysasiat, ja (10) asenne mainontaan. Tutkimuksen tulokset osoittavat, että havaittu viihteellisyys – nautinnollinen, hauska, ja interaktiivinen – on voimakkain tekijä, joka vaikuttaa asenteeseen, joka on sen sijaan voimakkain vaikuttava tekijä päätökseen ottaa sijaintiin perustuva mobiilimainonta käyttöön. Lisäksi löydettiin vahva epäsuora suhde kolmen muun tekijän – yhteensopivuus, havaittu hyödöllisyys, ja rahallinen kannuste – ja käyttöönoton välillä. Toisaalta, yksityisyysasioiden ja käyttöönoton sekä henkilökohtaisen innovaation ja käyttöönoton väliset suhteet eivät olleet tilastollisesti merkittäviä, joten johtopäätöksiä kyseisten muuttujien tärkeydestä käyttöönottoon ei voi tehdä tämän tutkimuksen perusteella.

Avainsanat: Mobiilimarkkinointi, mobiilimainonta, sijaintiinperustuvat palvelut, sijaintiinperustuva mainonta, paikkanuspalvelut, asenne, viihteellisyys, teknologian adaptaatio, rakenneyhtälömallinnus.

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1. Introduction

Location-based advertising, in the context of this research, refers to advertising communication where advertising messages are customized based on individuals' spatial, temporal, and personal information. These highly customized advertising messages are communicated to the recipient via application that is downloaded into the recipient's smart phone. The purpose of this study is to understand the factors that influence consumer acceptance and adoption of mobile location-based advertising drawing theories from the fields of technology adoption, social psychology, advertising, mobile marketing and consumer behavior. In this first chapter, the rapidly developing mobile marketing field and mobile phone market will be introduced and discussed. Furthermore, the research problem and objectives will be presented.

1.1. Background

Today's consumers are more fragmented than ever before and marketers are looking for alternative and innovative ways to capture people's hard to earn attention and connect with these fragments. The fragmentation of media consumption imposes a challenge, in the same time, traditional media is becoming less effective. Targeted advertising and two-way dialogue with customers are replacing and complementing the old advertising paradigm that focuses heavily on traditional mass marketing. Mobile marketing – marketing activities that are performed via mobile device – allow precise targeted advertising and interactivity, but has yet to fulfill the expectations and materialized as researchers and analysts have forecasted (Idean, 2009). Furthermore, " a killer application" is yet to be developed that would push the adoption of mobile marketing over the tipping point in gaining a critical mass to reach the early majority market and financial success.

Mobile phones are considered very personal devices and an integrated part of people's daily lives. They are often considered fashion statements and users seem to assign different symbolic meaning to their mobile phones (Katz & Sugiyama, 2006). Moreover, Katz and Sugiyama (2006) suggest that people incorporate mobile phones into their self-image and rely on them as status markers. Furthermore, mobile phones are no more used only for making voice calls and sending messages, but due to technical advancements, mobile phones have become pocket-sized computers and entertainment devices, referred as smart phones, that offer a plethora of uses and functions in areas such as entertainment, photography and Internet connectivity often utilizing touch sensitive user interfaces to access these applications. The essence of smart phones has been characterized as "anytime, anywhere and anything" (Wagner, 2011). Technology-related developments, among others, have allowed new commercial and recreational mobile services to be born, which in turn has made consumers who use these services more informed as they make buying decision. Mobile services improve the shopping experience at different stages of consumer decision-making process,

especially the need recognition and the information search stages (Karaatli *et al.*, 2010). Consumers can get real-time information of products and prices allowing easier and faster comparison of products and services. This has changed the dynamics of commerce, as it is more important than ever for a marketer to know about competitors in order to stay ahead.

Recent developments in mobile communication technology and changes in the mobile phone base are expected to improve the success of mobile marketing in the near future. In 2012, 49% of 16-74 age citizens in Finland owned a smart phone and the market penetration of smart phones is expected to grow to 57% by 2014 (Statistics Finland, 2012; Idean, 2009). As the penetration of smart phones grows rapidly, so does the number of mobile broadband subscriptions. This is a critical factor for mobile marketing to succeed, since it allows marketers to develop innovative applications and services that utilize access to the Internet. The increase in mobile broadband usage has been so dramatic that telecommunication companies are facing pressure to increase the price of data transfer or limit the maximum data transfer (Erkko, 2011). In 2012, 60% of smartphone owners used Internet via their mobile phone weekly, in 2011 the share was 48% (Statistics Finland, 2012). As smart phones and mobile broadband enable mobile marketing and location-based services, these statistics show that the platform for mobile marketing exists and that it is constantly growing.

This research will focus on one subcategory of mobile marketing, location-based services, that is widely expected to be the "killer application" that changes the landscape of the mobile communication industry. More specifically, the focus will be on one application of location-based service – location-based advertising. Location-based advertising uses positioning technologies to track and integrate individual user's location with other contextual information to provide added value to the user. This level of reachability and accessibility to user's real-time location information while on the move is unprecedented and has also raised controversies. The question of privacy and security as well as who has the right to use location data and how has been debated. Nevertheless, location-based services offer a variety of opportunities for users and marketers. From a marketer's perspective, location-based services offers new opportunities that could improve the effectiveness of advertising, increase the knowledge of customers and give the ability to engage customers in value and content creation. From users' perspective, location-based services allow individual users to access highly relevant information that is contextually relevant in terms of time, location and personal interests. AC Nielsen estimates that two-thirds of mobile phone users in the world are interested in location-based content that feeds user information about products and services in their vicinity (eMarketer, 2010). In 2010, only less than one-fifth of mobile advertising dollars spent utilized location strategy. It is estimated that location-based advertising will grow to $6.2 billion and be over one-third of all mobile advertising spending by 2015 (Pyramid Research, 2011). If mobile marketing is considered more broadly, Berg Insight predicts that global total mobile ads and marketing spending will quintuple by 2017 to 19.7 billion, which accounts 4.4% of all global ad spent in all channels (Berg Insight, 2012

cited in Gigaom, 2012). Changes in the mobile device technology, wireless infrastructure and market adoption have made mobile marketing a relevant research subject once again in the eyes of marketers and academics. After the introduction of Apple's iPhone and App Store in 2008, followed by Nokia's OVI and Google's Android Market, mobile applications has become a multi billion-dollar industry. This poses is a huge opportunity for marketers and third party value-added application providers.

1.2. Research gap

Location-based services are an important new field of research within mobile marketing today. Journal of Location Based Services was first published in 2007 and the number of academic research papers has increased since. Although location-based services have received more scholarly attention, outside the Journal of Location Based Services, the majority of articles are centered on the technical and infrastructure aspects of such services. Out of those articles that study location-based services from the business perspective, majority are qualitative in nature (Bruner & Kumar, 2007). Although academic research exists regarding attitudes toward location-based services and behavioral intentions (e.g. Gransaether *et al.,* 2010; Bruner & Kumar, 2007; Pura, 2005) and the effects of privacy concerns (e.g. Xu & Gupta, 2009; Grossklags *et al.,* 2007; Perusco & Michael, 2007; Barkhuus & Dey, 2003), more research is needed to get a holistic view of location-based services. Furthermore, mobile marketing has received relatively much more attention in academia in recent years. Those studies are very closely related to location-based services, but often lack measures that are distinct to location-based services. Since location-based services are a fairly new field of research, it is vital to measure these distinct characteristics. In particular, research from the customer perspective is important and useful for marketers in order to understand and predict the future of these services.

As technology changes rapidly and new applications are introduced constantly, research must be adjusted accordingly. Existing research on mobile marketing focuses heavily on the method of short messaging service (SMS) advertising (e.g. Yang *et al.*, 2010; Carroll *et al.*, 2007; Merisavo *et al.*, 2007; Pura, 2005; Tsang *et al.*, 2004;). New communication channels have been introduced that deliver advertisement via the application users have downloaded into their mobile phone and therefore, research must be adopted to measure this. SMS is considered very personal communication channel and therefore advertising via this channel can be considered intrusive by the consumer, and it is most likely that people have different perceptions toward the new delivery channel. It can be also assumed that people's attitudes, values and perceptions toward mobile advertising change over time. Facebook, Twitter, Foursquare and other social networks have become widely used by the public and the concept of privacy has changed especially among people born after the millennium, who have been using social networking and other web services from a very young age.

In the field of technology adoption, different models have been used to understand and predict the acceptance and adoption of various new innovations. Location-based services posses several distinct

characteristics that are not captured in the dominant technology adoption frameworks. Lately, there have been attempts to modify existing models to capture these characteristics. Xu and Gupta (2009) studied the acceptance of location-based services through the lens of privacy concerns and personal innovativeness while Chang *et al.* (2007) investigated the factors that negatively influence users' adoption of location-based services using a qualitative ZMET method. Furthermore, Pura (2005) studied the effect of perceived value dimensions on the usage of location-based services, and Banerjee and Dholakia (2008) explored the effectiveness of location-aware advertising and whether consumers perceive it intrusive. In addition, Bruner and Kumar (2007) proposed a model to measure customers' attitude toward location-based advertising (ALBA). Although, these studies, and others, have yielded important insight for this research, a new modified model is created that attempts to consider more accurately the particular nature of a specific application of location-based services – location-based advertising. The need for research in the field of mobile marketing and new technological platforms, especially in the field of location-based services is called for (Bruner & Kumar, 2007; Leppäniemi *et al*. 2006). This study attempts to fulfill this gap by exploring the factors that affect the adoption of location-based advertising.

1.3. Research problem and objectives

Before marketers can fully benefit from the new generation of mobile location-based services, these services must be widely accepted and adopted by consumers. The purpose of this study is to understand the factors that influence consumers' decision to use or not use location-based services. This study will take the customer perspective and study one application of location-based services – location-based advertising. As it is with any new innovation, the success of location-based advertising is determined by how public perceive these innovations. The purpose is to draw insight from dominant technology adoption theories, social psychology and advertising, and create a model that can be used to understand and predict the acceptance and adoption of location-based advertising. From a theoretical perspective, this will provide insight on *how* intentions to adopt are formed. In addition, this study will contribute to the field of location-based services by exploring one specific application and therefore, deepen the understanding of the customer-side of location-based services. Advertising has rarely been studied through the lens of adoption theories. Lastly, it will test the applicability and validity of the most often used constructs from existing technology adoption research and introduce a model that can be used to understand and predict the acceptance of new mobile services. From the perspective of practice, this study will help developers to design services that best fit consumer needs and preferences, and therefore, increase the probability of success. It will also help marketers to understand how location-based advertising can be incorporated in their marketing strategy. Thus, the primary research question is:

What are the factors that influence consumer adoption of mobile location-based advertising?

The secondary research questions are:

1. What is the relative importance of these factors on determining adoption of location-based advertising?
2. What is the role of personal innovativeness and privacy concerns influencing the adoption of location-based advertising?
3. What are the main barriers for adoption?

2. Location-based Services

Since location-based services are fairly new in the market, this chapter will introduce location-based services in more detail and discuss important topics revolving around these services.

2.1. Overview

Location-based services can be described as a range of services that utilize and depend on locating and positioning a users geographical location. The most interesting application of these services is in the mobile context. The range of mobile location-based services is wide, from public safety services to games, information services to tracking services. Various other mobile commerce applications exist, e.g. location-based advertising that is also the subject of this research. Locating an entity, a person or a physical object, is not very valuable itself. When that information is combined with spatial and temporal information, it becomes valuable and useful market intelligence. Linking these parameters with existing knowledge of individual's interests offer an interesting marketing potential for companies and a real value proposition for consumers (Unni & Harmon, 2007). Combining spatial, temporal, and customer information allows marketers to target consumers more precisely than with traditional marketing channels such as TV, print and radio, which have not been able to provide acceptable precision even though highly targeted advertising is in the center of marketing concept (Mishra, 2000)

Foursquare represent a practical example of a mobile location-based service that has been already widely adopted by a segment of the public with over 30 million users worldwide (Foursquare, 2013). It is a free application for smart phones that connects users to their environment using GPS positioning technology that mobile phones have built-in. Foursquare allows users to search for points of interests, such as businesses, museums, etc. that are nearby. As users physically enter these locations, they can "check-in" using their mobile phone and if they choose, share the location information to their network of friends in Facebook and other social networking sites. This allows friends to monitor the location of the user and his/hers shopping behavior in terms of what places and stores they visit. Foursquare uses crowdsourcing to create content within the service. Users are able to create locations and write recommendations to existing venues for others to read. On top of this, the

application revolves around a gaming mechanism in which users collect "badges" for "checking-in" frequently to a venue (Mayor badge) or "checking-in" to many different venues (Adventurer badge). These badges, in turn, engage users to use the service more frequently and compete with their network of friends. Foursquare is an interesting example because it combines social networking, gaming and location-based services. Essentially, Foursquare integrates pull strategy information, navigation, social network and loyalty/bonus program service. For businesses, Foursquare offers a new marketing channel and way to have dialogue with customers and interact with them in an engaging way. Businesses receive valuable information about the consumers who "check-in" to their venues, about who they are, where they shop and when. This information is often used for loyalty programs to offer loyal customer benefits, e.g. a discount for "checking-in". In addition, "check-ins" works as word-of-mouth advertising campaigns for companies as users show their consumption behavior to their social networks.

Although Foursquare is probably one of the most adopted location-based service in its category, it is still developing its business model and service. It does not currently offer location-based advertising, which is one of the most interesting applications of location-based services and which has also recently raised increased interest in the academic world (e.g. Hühn, 2011; Banerjee & Dholakia, 2008; Bruner & Kumar, 2007; Unni & Harmon, 2007). Location-based advertising is by no means a new phenomenon. Roadside billboard advertisements and localized radio advertisements have essentially offered the same value to consumers for decades – location specific information about products and services nearby. The same can be concluded from LCD-screen billboards with rotating adverts in public transportation and bus stops that can be considered gradual innovations to traditional billboards. These on-board or bus stop terminal advertisements can easily be localized and customized digitally based on, for example, the bus route or the time of day to reach the targeted segment. These channels all have in common that they are static in nature, not allowing tracing of a specific user with no interaction feature. Location-based advertising offers the ability to focus on a specific user and offer advertisements more dynamically as consumers are on the move. The central idea behind location-based advertising is that information and advertisements can be tailored to users profile and filtered based on location and time. Moreover, location-based advertising allows interaction between the advertiser and the user as purchasing and booking is possible using mobile technology.

2.2. Challenges

It is widely agreed that the FCC "E911" mandate in the U.S. and 2002/22/EC directive in the EU, requiring mobile operators to build an infrastructure to locate callers in the case of a emergency, was integral in the development of commercial location-based services. From the technological perspective, the first generation location-based services in the late 1990's relied on technologies such

as cellular tower triangulation for positioning users rather than GPS and Wi-Fi that are used now. These technologies were rather inaccurate and led to development of services with poor quality and held little interest to the public (Khurri & Luukkainen, 2009). Earliest location-based services focused locating nearby points of interests using pull strategy in which a users requested via SMS the operator to send information about nearest e.g. gas stations, but the insufficient accuracy, ranging from few hundred meters to several kilometers depending on the area, led to failure of these services (Khurri & Luukkainen, 2009). The operators dominated the value chain in the middle of the 90's, as they were concurrently the equipment vendors, network operators, and service and content providers in the location-based service ecosystem. This monopolistic power of network operators negatively affected the adoption and acceptance of location-based services according to Bellavista *et al.* (2008), as there was a lack of trust between the user and the operator.

The environment is present today for location-based advertising to become successful and adopted by the public. First of all, the technological limitations are less critical today, as the screen size and processing power of mobile phones have increased. GPS positioning ability is integrated into most smart phones on the market and 3G broadband network is readily available to access the web anywhere and anytime. Some challenges still exist, such as the low satellite signal in city settings and indoors, decreased battery life when using location-based service applications and the usability of these services (Khurri & Luukkainen, 2009). Alternative technologies exist that improve accuracy of these services indoors and in tight places between buildings in the city such as assisted-GPS and WIFI both still fairly new in mobile applications. Secondly, research has suggested that people are interested in mobile services that use location-based technologies (e.g. Gransaether *el al.*, 2010; Jones & Grandhi, 2005). Thirdly, the role of network operators in location-based service ecosystems has decreased dramatically and the value chain has shifted to integrated value networks. The ecosystem now includes several market actors each with smaller control that could improve the trust between users and service providers.

Although the market seems ready for location-based services to become successful, challenges still remain regarding of privacy concerns. In the 80's, direct marketers were among the few businesses that used computer databases to track and analyze individual level consumer characteristics and purchases (Phelps *et al.*, 2000). Today, collecting and using individual customer information represents a common business practice in wide range of industries. Individual level customer data provides marketers a range of benefits from identifying important customer segments, creating promotion and reward programs that build customer loyalty, to implementing targeted advertising and monitoring its effectiveness (Hughes, 1994; Jackson & Wang, 1994 cited in Phelps *et al.*, 2000). Location-based advertising relies on tracking peoples' location and connecting that data to individual customer information, which in turn allows sending targeted advertisement that is not only timely and spatially relevant but also aligned with customers' own preferences and interests. Since these services

collect, store and analyze large amounts of different kinds of individual level customer information, privacy and security concerns are often raised: who has the right to gather and use specific customer information and how? For this study, the important question is how consumers perceive privacy and whether it will be a barrier to using location-based advertising in the future. Concerns regarding location data are often associated with others being able to monitor where the user is all the time. This, in turn, raises the question of personal safety and people's willingness to provide this information. In most location-based services, users must explicitly choose to show others where they are at certain points of time and the information is not distributed forward without the permission of the user. In location-based advertising, location information is rarely shared except with the company providing the service.

The legal privacy framework for location-based service industry in the EU was set in the Directive on Privacy and Electronic Communications (Directive 2002/58/EC). In Finland, the directive was implemented and made into the Electronic Communication and Data Protection Law two years later. The regulations regarding location information can be found in chapter four, which states that value-added service providers must have permission before tracking the user and that the user must be informed if location information is accessed by third parties (SVTSL, 516/2004).

3. Literature Review

In the following section, the theoretical concepts adopted in this study will be discussed. The most influential adoption theories and models for the context of this study will be introduced. Based on extensive literature review, the factors that influence adoption of location-based advertising are discussed and hypotheses are formulated. In the end of this section, a proposed modified conceptual model is presented with the list of formulated hypotheses.

3.1. Theoretical framework

Researchers have for decades studied adoption of technologies within social systems in order to understand why certain technologies diffuse to the public and to build theoretical models that predict the acceptance and adoption of technologies. The foundations of many existing technology adoption models are in sociology, more specifically in Rogers' Innovation Diffusion Theory (from now on referred as IDT) developed in 1962. Rogers (1995) studied a variety of innovations in different contexts from adoption of new agricultural tools, to family planning, and his work has since been replicated in numerous studies. Other streams of adoption and acceptance theories, Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM) and Theory of Reasoned Action (TRA) are grounded in social psychology. In these theories, actual behavior, intentions to perform the behavior, and the antecedents of attitude are explored to understand individual behavior (Agarwal & Prasad, 1998). These models explain the relationship between beliefs, social norms and attitudes that

influence individual behavior leading to acceptance and adoption of new ideas and ways of doing things. These theories agree that people's actions are based on rational thinking. The actual or future usage, for example technology, is based on beliefs of how using a particular technology will affect the individual. Although these theories have many similarities, as Venkatesh (2003) points out, they still differ in terms of the context they fit in and on factors that are believed to influence individual behavior. By drawing insight from these adoption theories, the purpose is to create a modified model that fits the context of location-based advertising to produce in-depth knowledge of the salient antecedents of adoption of location-based advertising. This approach to study location-based advertising will answer how intentions to adopt are formed.

Leppäniemi *et al.* (2006) reviewed mobile marketing research and classified them into three categories:

- Consumer – acceptance, perceptions and effectiveness of mobile marketing
- Business and Management – business models and value chains
- General – legal and political issues, adoption and diffusion of mobile marketing

This study explores factors that influence the adoption and acceptance of location-based advertising where perceptions and attitudes play a central role. Therefore, it cannot be directly classified in just one of the above categories. This research contributes to both consumer side research and general research in mobile marketing. Leppäniemi (2006) points out that factors related to customers have been the main focus of mobile marketing research in the past. Exploring these issue through the lens of technology adoption theories has been less studied. The next paragraphs will discuss the important theories in more detail.

3.1.1. Innovation Diffusion Theory (IDT)

Rogers' work on innovation diffusion is centered on four central factors that attempt to predict the process of individual adoption and how it spreads through a population: the innovation characteristics, communication channels, social systems and time (individual user characteristics) (Rogers, 1995). The last three components are important and have yielded valuable insight for marketing scholars, e.g. the normally shaped innovation diffusion curve over time, categories of individual innovativeness, and five stages of the adoption process. However, this paper will focus on the first concept, the innovation itself, as it is the most relevant in the context of this research. Below is the description of the factors that according to Rogers (1995), influence the individual adoption and acceptance of innovations regarding the perceptions toward innovation itself.

Table 1. Innovation Diffusion Theory - Perceptions of innovation itself (Rogers, 1995)

Relative Advantage	"The degree to which an innovation is perceived as being better than its precursor"
Compatibility	"The degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters"
Complexity	"The degree to which an innovation is perceived as being difficult to use"
Observability	"The degree to which the results of an innovation are observable to others"
Trialability	"The degree to which an innovation may be experimented with before adoption"

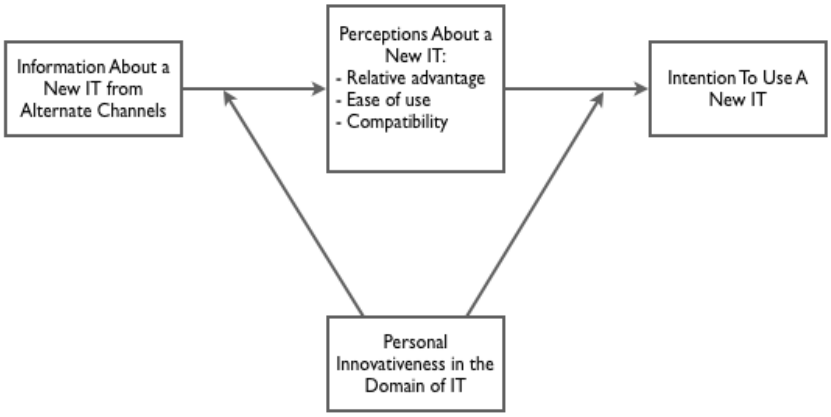
Rogers (1995) describes innovations very broadly as "an idea, practice or object that is perceived as new by an individual or other unit of adoption". This broad definition of innovations and the breath and depth of the theory makes IDT framework flexible to fit both formal and informal environments (Straub, 2009), although most of the research was conducted in informal environments such as agricultural technique adoption and family planning adoption in social systems (Rogers, 1995).

Moore and Benbasat (1991) used IDT theory as a base and refined it to predict the adoption of information technology innovations within organization that represent formal environments. Since the early days of computerization, the utilization of information technology in organizations has become increasingly critical to companies staying competitive and improving performance. Therefore, a number of studies have examined antecedents and factors that influence the adoption and acceptance of these systems (Davis *et al.*, 1989; Moore & Benbasat, 1991; Taylor & Todd, 1995). Moore and Banbasat (1991) concluded that existing adoption research lacked validity and reliability, so they refined IDT and found support for their framework. Instead of measuring perceptions toward the innovation *itself*, they concluded it would be more accurate to measure the perception of *using* the innovation, because people perceive primary characteristics of innovation in different ways and therefore the behavior might differ. Furthermore, attitudes toward *an object* can differ from attitude toward actual behavior of *using* that object (Ajzen & Fishbein, 1980). For example, an individual may have negative attitude toward a product, e.g. location-based advertising, but might end up using it because it will bring him/her positive results, such being able to communicate with friends, economic benefits or being socially accepted. Moore and Benbasat (1991) refined Rogers' five attributes by rewording them so that the focus was on the perception of *using* the innovation rather than the innovation *itself*.

In addition, Moore and Benbasat (1991) expanded the five factors of IDT to eight, which were validated in their study. Completely new factors were *image* and *voluntariness*. Although *image* was captured in Rogers' classification under *relative advantage* as "undoubtedly one of the most important motivations for almost any individual to adopt an innovation is the desire to gain social status" (Rogers, 1995), other researchers have found the effect of *image* to be different from relative advantage, and therefore, should be considered a separate factor (Moore & Benbasat, 1991). Another new factor was *voluntariness of use,* described as "the degree to which use of the innovation is perceived as being voluntary, or of free will" (Moore & Benbasat, 1991). This is something that is relevant in both formal and informal adoption environments. In organizations, it will have great implications on how and in what time frame technology is being adopted. This holds true in an informal environment as well. For example, when existing technology becomes obsolete and is being replaced by new technology, people are involuntarily behaving in a certain way and even pressure from the social relations might push others to adopt certain technologies. In addition to the two new factors, *Observability* was divided into two factors because it was concluded to represent two distinct constructs *result demonstrability,* referring to tangibility of the results, and *visibility,* referring to how well potential adopter can see an innovation (Moore & Benbasat, 1991). So the complete list of refined factors includes: *relative advantage, compatibility, voluntariness, image, ease of use* (adopted from TAM, which is discussed later), *result demonstrability, and visibility.*

Agarwal and Prasad (1998) also used Rogers' work in IDT as a base as they developed a model that better fit the information systems context, but unlike Moore and Benbasat (1991), they examined individual user characteristics to predict adoption. They focused on personal innovativeness, also discussed extensively in Rogers' work, and thus, provided theoretical insight to the question of how adoption intentions are formed by including individual traits and personal innovativeness to the model (Agarwal & Prasad, 1998). Their model also has implications to marketing practice by helping marketers identify individuals who are more likely to adopt innovations and in the same time facilitate diffusion to the social system by working as change agents and as opinion leaders as Rogers (1995) describes the roles of innovators. Agarwal and Prasad (1998) argue that personal innovativeness works as a moderator for antecedents as well as consequences of perceptions about the innovation. This analysis is highly related to Rogers' innovator categories. Personal innovativeness influences the perceptions since people with different levels of innovativeness utilize different channels of communication to develop perceptions. In addition, some are more active information's seekers than others (Agarwal & Prasad, 1998). People with different levels of innovativeness differ in the amount of uncertainty, risk and imprecision they are willing to cope with when faced with new technology (Rogers 1995). Therefore, personal innovativeness works as a moderating factor after initial perceptions that in the end effect intention to use innovation (Agarwal & Prasad, 1998). Below is a graph showing the relationship of personal innovativeness on perceptions and intention to use.

Figure 1. Relationships Between Personal Innovativeness and Other Technology Acceptance Constructs (Agarwal & Prasad, 1998)



3.1.2. Technology Acceptance Model (TAM) and Theory of Reasoned Action (TRA)

TAM is probably the mostly used model to explain IT usage and has received considerable empirical support (Venkatesh *et al.*, 2007). TAM can be considered an adaptation of Fishbein and Ajzen's more general *Theory of Reasoned Action* (TRA), which is a well-researched adoption model that has been proven to predict and explain behavior in variety of contexts (Davis *et al.*, 1989). TAM, on the other hand, is specifically tailored for examining user acceptance of information systems in organizational context. The central idea of TAM is that an individual's affective response (attitude) toward using a technology determines the intention to use the technology. Intention to use the technology, in turn, is a direct determinant of behavior, which in this context refers to usage of technology (see Figure 2). Furthermore, attitude reflects individuals favorable and unfavorable feelings toward using the technology, and the attitude in TAM is determined by two beliefs about the technology usage: *Perceived Usefulness* (PU), "the degree to which a person believes that using a particular system would enhance his or her job performance", and *Perceived Ease of Use* (PEU), "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). TRA and TAM models are presented below.

Figure 2. Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980)

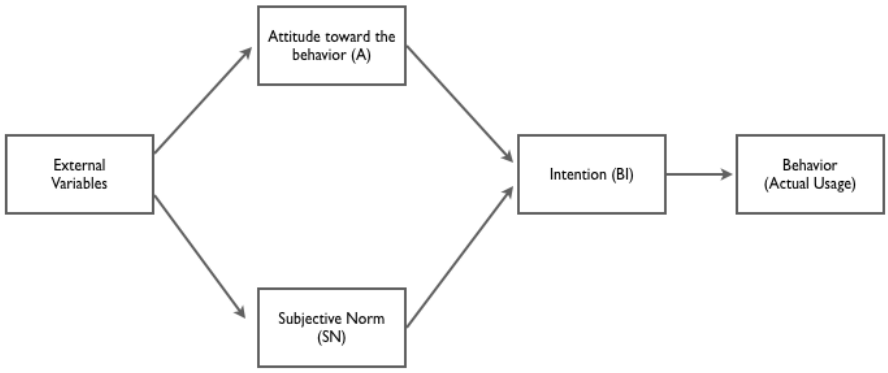
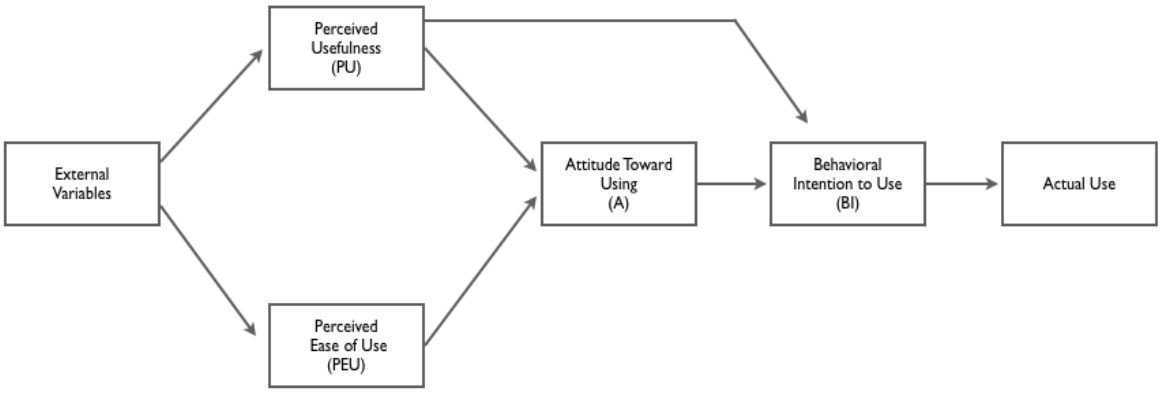


Figure 3. Technology Acceptance Model (TAM) (Davis *et al.*, 1989)



The main goal of these models is to understand and predict individual's behavior. According to Ajzen and Fishbein (1980), behavior is not difficult to predict and, therefore individual's intention is viewed as a determinant for behavior. The underlying idea is that if predictions are to be made whether an individual will buy or use a product, the most efficient and simple way is to ask if he/she intends to do so, because people usually do what they intend to (Ajzen & Fishbein, 1980). Sheppard *et al.* (1988) conducted a meta-analysis of empirical studies that used the TRA model to assess the validity of intentions and actual usage relationship and found strong support for the intention model to have predictive utility for actual usage as long as behavior is not affected by lack of individual control. Since the adoption of location-based advertising is completely voluntary, an intention-based approach is utilized in this study.

Although very similar, TAM and TRA differ in some aspects. Firstly, in contrast to TRA, TAM posits that factors other than attitude can have direct effect on behavior intention (Davis *et al.*, 1989). In

TAM, the *perceived usefulness – behavioral intention* relationship examines the direct effect of *perceived usefulness* to *intention to use* the technology (See Figure 3). The idea is that people form intentions toward using regardless of whether they have positive or negative feelings toward the behavior. In an organizational setting, for example, people might adopt technology because they believe it will increase their job performance, even though they have negative feelings toward actual usage (Davis *et al.*, 1989). Therefore, an intention to use information technology is largely a cognitive appraisal of how the technology will improve performance (Davis *et al.*, 1989). Secondly, TAM does not include *subjective norm* to predict adoption. *Subjective norm* can be defined as "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Ajzen and Fishbein, 1980). Moore and Benbasat (1991) also identified the role of social influence as the *image* construct in their IDT model. However, Davis *et al.* (1989) found no significant relationship between social norms and intentions, therefore this construct is not included in the original TAM as direct determinant of behavior intention. The exclusion of *social norm* is explained by the difficulty to differentiate whether it has direct influence on behavior intention or if it is indirect via attitude (Davis *et al.*, 1989; Taylor & Todd, 1995). Thirdly, the difference between TAM and TRA is that TAM specifies two beliefs that determine attitude toward usage while in TRA, determinants for attitude are not specified due to their general nature and therefore salient beliefs for the context must be first identified with their relative weight to conduct an investigation of attitudes and social norms. The essential idea of both models is the same: attitudes are direct determinants of behavioral intention. Both models argue that other factors that influence the behavior intention does it so indirectly via attitude. In other words, external factors such as demographics, attitude toward targets and personality traits, described by Ajzen and Fishbein (1980) as "external variables" affect the formation of attitudes, and in turn, intentions.

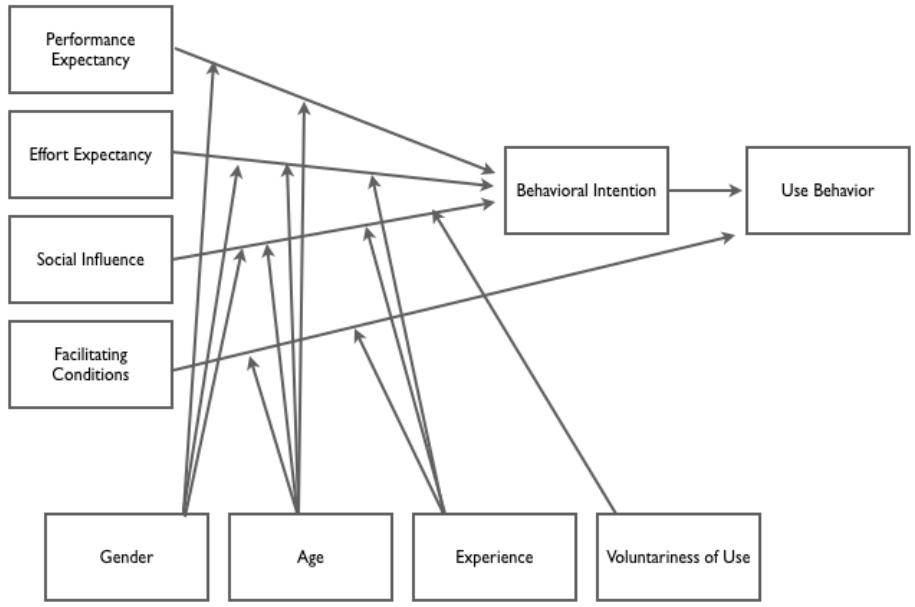
Since its development, TAM has been modified and used in a variety of studies. Venkatesh and Davis (2000) extended the model with social influence and cognitive influential process and found a significant relationship between social norm and behavioral intention in the model. The extended theoretical model was named TAM2. TAM has been used in a number of different types of information system contexts from voice mail to digital libraries and studies have been done in different countries as well (see Venkatesh *et al.*, 2007). Although TAM was originally developed to study technology adoption in organizations, it has also been used to study other domains such as advertising and marketing. Dabholkar and Baqozzi (2002) used TAM as the base framework and studied how consumer traits and situational factors moderate the usage of technology-based self-services (touch screens for ordering food) in fast food restaurants. In the advertising context, Rodgers and Chen (2002), used constructs from TAM and IDT, *relative advantage* and *complexity*, to study post-adoption attitudes toward Internet advertising from the practitioners' perspective. Furthermore, TAM has been used to study a variety of other technology-related behaviors such as dairy farming

(Flett *et al.,* 2004 cited in Venkatesh *et al.*, 2007) and green electricity usage (Arkesteijn & Oerlemans, 2005 cited in Venkatesh *et al.*, 2007). The diversity of research utilizing TAM in the past shows the applicability of the model in different contexts outside the domain of its original purpose.

3.1.3. Other adoption and acceptance models

There are several other theories that predict and explain human behavior that can also be used to study technology acceptance. Venkatesh *et al.* (2003) reviewed the existing theories and empirically tested eight models and their extensions. They formulated and empirically validated a model that combined constructs from the existing models. The eight models under examination were TRA, TAM, Motivational Model, Theory of Planned Behavior (TPB), Model Combining TPB/TAM, Model of PC utilization, IDT and Social Cognitive Theory. Below is the research model of Unified Theory of Acceptance and Use of Technology (UTAUT) they formulated.

Figure 4. Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.,* 2003)



This model has many similarities to TAM, IDT and their extensions. Performance expectance and effort expectancy are very similar to perceived usefulness and ease of use in TAM as well as relative advantage and complexity in IDT. Social influence refers to factors similar to social norm and image represented in TRA, IDT and TAM2. Facilitating conditions are defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh *et al.*, 2003) that, in turn, is embodied similarly by compatibility in IDT, although it is more focused on perceptions of the use of technology being consistent with values and needs.

Some of the four moderating factors (gender, age, experience and voluntariness of use) are also part of original IDT model, not in the innovation characteristics, but individual characteristics that group people with different levels of innovativeness. In TAM and TRA, these moderating factors represent "external variables" that have indirect effect on intentions via perceived usefulness or perceived ease of use to attitude that is direct determinant of intention.

3.2. Conceptual model and Hypotheses development

The purpose of this research is to understand consumer perceptions toward mobile location-based advertising and develop a model that can be accurately used to predict the adoption of such advertising channels by the public. Since TAM and TRA have gained widespread acceptance in IS literature and their validity has been supported by several studies, they will be used as the base framework for this study. Downloading location-based service application and allowing location-based advertising to one's mobile phone is a rational and conscious behavior rather than one under unconscious motives. TRA and TAM provide a suitable starting point to measure such behavior. These models have only a few explanatory variables, therefore, it is recognized that it would be useful to develop a modified adoption model, drawing theories and findings from the field of advertising in order to get fruitful insight into the context of mobile location-based advertising. In TRA, investigations should be made to formulate salient beliefs that affect attitudes and social norms. These salient beliefs and antecedents will be formulated drawing from existing research. Following sections will introduce and discuss the proposed factors that influence the adoption of location-based advertising with a hypothesis that will later be tested for validity.

Since location-based advertising is still in its infancy of commercial development, most consumers have little experience and knowledge of these possibilities and therefore, adoption has not yet happened in large scale. Thus, retrospective empirical examination of adoption is almost impossible or at least it will not provide relevant findings at this time in the adoption curve of location-based advertising, and therefore, the acceptance and adoption is measured and forecasted by people's intentions to use them in the future. Aligned with the current state of location-based advertising and existing adoption research, intentions are considered to represent the actual usage as its predictive power has been validated and tested in numerous studies (e.g. Sheppard *et al.,* 1988). Based on extensive review of publications regarding the acceptance and usage intentions of mobile advertising, location-aware technology and adoption of technology and IS in general, 10 factors are proposed as determinants of intention to use: (1) attitude, (2) social influence, (3) perceived usefulness, (4) perceived ease of use, (5) perceived enjoyment, (6) compatibility, (7) incentives, (8) personal innovativeness, (9) privacy issues, and (10) attitude toward advertising in general. The next chapters will discuss each of these determinants in more detail.

3.2.1. Attitude

Adoption theory context

Attitude is a widely used construct in marketing and adoption of information systems research. Ajzen and Fishbein (1980) defined attitude as " individual's positive or negative evaluation of performing the behavior". The direct influence of attitude on intention to use has empirically been supported by several studies using different adoption frameworks (e.g. Ajzen and Fishbein, 1980; Davis, 1989; Davis *et al.*, 1989; Shimp & Kavas, 1984; Taylor & Todd, 1995). According to Ajzen and Fishbein (1980), attitudes are a function of beliefs and generally, when people believe performing a behavior will lead to positive outcome, they will hold positive attitudes toward performing the behavior and act in accordance.

Attitude as antecedent of intentions has also been used in adoption research in the everyday-life and mobile marketing context in recent years. Pagani (2004) examined the adoption of mobile multimedia services in which attitude was the sole direct determinant for intention to use these services. A conjoint analysis was used to understand the hierarchies of importance of factors that influences attitudes. Kim *et al.* (2011), in turn, studied adoption of mobile communication services by exploring how attitudes toward multimedia messaging, psychological traits and social factors influence behavioral intention to adopt multimedia messaging. A strong correlation between attitude and behavioral intention was discovered. Nysveen *et al.* (2005) also studied mobile services using attitude as a construct. In their research, they took into account the type of interactivity (machine interactivity vs. person interactivity) and process characteristics (goal-directed process vs. experimental process) of mobile services by using structural equation modeling analysis to understand how factors influence attitude and intentions depending on the mobile service category. Person interactivity refers to "interaction between people that occurs through the medium" (Hoffman and Novak, 1996). Machine interactivity in turn refers to "interactivity with the medium in which a user can participate in modifying the form and content of mediated environment in real time" (Steuer, 1992). Furthermore, a goal-directed process refers to the motivation behind using, which is based on rational benefits whereas experimental process refers to more on hedonistic benefits (Hoffmand and Novak, 1996). Findings suggest that attitudes are more influential in intention to use in the case of person-interactive than for machine-interactive services (Nysveen *et al.*, 2005). This finding is relevant to location-based services and advertising because many of its current applications in the market are connected to sharing of location information to the social network of friends and therefore should be used as a construct to determine the adoption. Nysveen *et al.* (2005) found also that their extended model of TAM with antecedent variables explains 72.3 percent of intention to use various forms of technology while the traditional TAM explains only 40 percent. This study takes a similar approach by

exploring several antecedents rather than just *perceived ease of use* and *perceived usefulness* as in TAM, and *attitude* and *social norm* in TRA.

Furthermore, Kofod-Peterson *et al.*, (2010) studied attitudes towards location-aware social network services in their experimental study to get insight to the question of whether people are willing to use a location-aware social application. The experiment used FindMyFriend service that allowed group of people the see the location of others when they check-in to locations. Rather than measuring how significantly different variables influence intentions to use these services, they explored the behavior of users in the experiment and their attitudes towards it. 55 percent of the participants were willing to continue the use of similar services if they were offered on their smart phones. Findings were similar when users were asked if they would like to use location aware social services on a larger scale as well.

Advertising theory context

Consumer attitudes toward advertising have been researched extensively to understand characteristics of effective advertising. In this research, the focus is on the general attitude toward advertising (Aadv) rather than attitude toward a specific advertisement (Aad) since the goal is to understand the factors that influence acceptance of mobile location-based advertising as a channel of delivery rather than to study message effectiveness. Attitude toward advertising in general (Aadv) can be defined as "a learned predisposition to respond in the consistently favorable or unfavorable manner to advertising in general" (Luntz, 1985 cited in Mehta, 2000). Attitude toward advertising in general (Aadv) has been recognized in previous research as one of the determinants to the attitude to toward a specific ad (Aad) (Luntz, 1985 cited in Bruner & Kumar, 2007).

Since the 1970's, attitudes towards advertising in general have been increasingly negative and attitudes are found to differ when variety of media channels are compared (Zanot, 1981; Bogart, 1990 cited in Tsang *et al.,* 2004). Elliot and Speck (1998) also discovered the role of the channel of delivery in the attitude formation and supported the positive relationship between the attitude toward the medium and attitude toward a specific ad (Bruner & Kumar, 2007). Since the channel of delivery affects attitude toward advertising it is important to explore location-based advertising and not to generalize results from studies that have explored different advertising channels.

In mobile advertising context, there is a direct and strong relationship between attitudes toward mobile advertising and intention to use mobile advertising among the public (Bauer *et al.*, 2005; Tsang *et al.*, 2004). Most of the studies on mobile advertising have not considered the ability to provide location specific, targeted ads to consumers, or this has only been one factor among many other variables as content and relevance construct in the research model. Several studies have also

found that permission-based advertising, where customers explicitly allow marketers to send advertising messages, significantly affects consumers' attitudes and acceptance (Carroll *et al.*, 2007; Tsang *et al.*, 2004). Merisavo *et al.* (2007) found no significant effect on consumer control over mobile advertising messages, but concluded that this might indicate that permission-based approach is already taken for granted by the consumers. Since mobile phones are personal devices, advertisement without permission is often considered intrusive and a form of spam. The nature of location-based advertising requires consumer's to download an application to their mobile phone that makes it possible to receive location-based ads. Therefore, consumers have already made initial approval to receive ads, but it is still important to understand the degree to which consumers wish to have control and what kind of advertisements are sent to their mobile phones. Thus, based on review of attitudes from in the context of adoption and advertising, it is hypothesized that:

> **H1:** Attitude toward using location-based advertising is positively related to consumer intentions to use location-based advertising.

It is important to understand customer's attitudes toward advertising in general (Aadv), not only location specific, in order to eliminate the possibility that general attitudes would influence the results. If a person has a negative attitude toward regular advertising (e.g. in TV, print and radio) it is most likely that they will have a negative attitude toward location-based advertising for mobile devices. Although the attitudes toward both types of advertising are related, attitude toward adverting in general is more stable than attitude toward location-based advertising, since it can be seen as an innovation. Consequently, attitudes toward mobile advertising are more easily changed than attitudes toward advertising in general (Bauer *et al*, 2005). Since it was acknowledged that respondents' negative predisposition toward advertising can influence the results of this study, a measurement was added for this purpose. Thus, it is hypothesized that:

> **H10:** Attitude toward advertising in general is positively related to attitude toward location-based advertising.

3.2.2. Social Influence

Social influence is one of two proposed direct determinants of intention. The notion that the social environment influences individual intention and behavior and the way an individual believes others will view certain behavior is present in many technology adoption theories and models. Although social influence was not a separate construct in Rogers IDT, he argues that, for many, one important motivation to adopt an innovation is the desire to enhance social status (Rogers, 1995). In Rogers IDT, social influence is an aspect of relative advantage construct but it has been argued by some researchers that these constructs should be considered as separate factors since their effects are so

different (Tornatzky and Klein, 1982 cited in Moore & Benbasat, 1991). Therefore*, image*, defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system", was added to Moore's and Benbasat's (1991) IDT model. Similarly, the importance of social influence is captured by the construct of *subjective norm*, also called *normative beliefs*, in TRA, TPB, UTAUT and TAM2. These models have adopted similar meaning to *subjective norm*, as in TRA: "perception that most people who are important to him think he should or should not perform the behavior in question" (Ajzen & Fishbein, 1980).

Although *image* and *social norms* both measure the influence of the social environment on adoption, they actually are quite different. *Image* refers to perceptions of how a behavior will enhance one's social status in the eyes of others while *social norms* refers to the perception of whether others think it is right or wrong for an individual to engage in a certain behavior. For this study, both views are important. At first glance, location-based advertising and services are not the class of innovation in which status gains are the primary motivations, as they are not highly visible and observable to others. However, it is an important consideration, because location based services, such as Foursquare and Facebook Places, allow individuals to share their location information to their peers. By doing this, people have the control to show others their "social status" in terms of what kind of places they "check-in". People can show their consumption behavior of products, places and services that represent a persons status or belonging to a social group by communicating what brands, restaurants, shops, movies, and events they visit and consume. Thus, enhance their social status. Since location based advertising can be considered as an innovation, using this kind of mobile service could also communicate the level of innovativeness and cleverness of an individual to their peers.

This distinction of social behavior has been noted in various studies. Hung *et al.* (2003) called them peer and external influences in their WAP service adoption research. Peer influence refers to complying with expectations of various significant others and external influences include mass media influence and other non-personal information sources. The relationship between peer influence and subjective norm was found significant; external influences were not, also with support for social norms' predictive power toward intentions. Hsu *et al.* (2006) similarly divided social behavior influences to primary and secondary groups in which the former refers to people that are in close interaction with individual such as family and friends and the latter to a group with less interaction, such as television ads, newspaper and magazines and brands. The findings in this mobile coupon adoption research were similar to the prior example: the positive relationship between the primary group was established but the secondary group was found insignificant. Although both of these studies did not have external factors influencing social norms, this will be incorporated into the research since it plays a large role in the subject at hand. These two types of behavioral influences

will be measured under one construct called social influences, which is expected to hold a positive relationship to behavioral intentions.

One could argue that *social influences* would influence *behavioral intention* indirectly through *attitude* as all the other constructs do in this research. However, attitude toward using a product can be negative while the social influence tips a person to be inclined to have intentions to use that product due the influence of their important social group. Furthermore, the direct predictive power and importance of social influence has been validated by number of studies (e.g. Ajzen and Fishbein, 1980; Moore and Benbasat, 1991;Taylor and Todd, 1995; Venkatesh, 2003). Taylor and Todd (1995), in their comparative study of adoption models, found that subjective norm was a direct determinant of intention. Moreover, subjective norm was found to increase the explanatory power of behavior intention. In their follow up study they also found that social norm is a more important predictor of intention for people with no experience than for those with experience (Taylor and Todd, 1995). Some studies have found that social norms are significant only in a mandatory setting or to be more significant among older workers and women in early stages of experience (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000, Morris and Venkatesh, 2000 cited in Venkatesh *et al.,* 2003). In mobile marketing context, social influence is also an often used construct. It has been used in studies on usage intentions of mobile location-based service (Pura, 2005), acceptance of mobile phone as an advertising channel (Bauer, 2005), and new mobile communication services (Kim *et al.* 2010; Nysveen *et al.,* 2005). Thus it is proposed that:

H2: Social influences are positively related to intentions to use location-based advertising.

3.2.3. Perceived Usefulness

Perceived usefulness and similar constructs have been used in numerous studies to explain and predict adoption of systems. The central idea is that perceived usefulness influences peoples' attitudes toward using a system that in turn influences intentions. Davis (1989) defined perceived usefulness as "the degree to which is a person believes that using a particular system would enhance his or her job performance". In turn, Rogers' (1995) similar construct of relative advantage refers to "the degree an innovation is perceived as being better than the idea it supersedes". This definition was refined by Moore and Benbasat (1991) and referred to perceptions of *using* the innovation rather than perceptions toward the innovation *itself*. In addition, the focus is on perceptions of characteristics and usage rather than primary attributes of an innovation. Studying primary attributes of innovations has been found to cause inconsistencies across studies (Downs and Mohr, 1976 cited in Moore and Benbasat, 1991). The reason for this inconsistency is that primary attributes are built-in to the

innovation, independent of the perceptions by people; people perceive primary attributes in different ways. Price is a classical example since the primary characteristic is the same for everyone, 2.99€, but the way people perceive this either as expensive or inexpensive differs. The above discussion is important in the context of location-based advertising, since people might hold negative perceptions toward the innovation itself and its primary attributes, e.g. in the form negative perceptions toward the privacy aspects of allowing tracking of ones location, but still perceive using the location-based advertising positive since it will provide them economic or social benefits. None of the definitions above completely fit the context of this study, since the research is not focused on job performance and there are no easily observable precursors to mobile location-based advertising. Therefore, perceived usefulness is defined here as "the degree to which a person believes that using a system provides value to its user".

The theoretical importance of perceived usefulness in explaining and predicting behavior has been supported by several research studies. Two research papers that introduced TAM found that perceived usefulness is strongly correlated to peoples' intentions, explaining more than half of the variance in intentions (Davis, 1989; Davis *et al.*, 1989). Venkatesh *et al.* (2003) compared eight prominent adoption models. Six of those models had perceived usefulness or similar construct. Perceived usefulness and similar constructs were found to be the strongest predictors of intentions. In accordance with TAM, it postulated that not only does perceived usefulness have indirect influence to intentions through attitude, but also direct influence to intentions.

In mobile marketing, perceived usefulness is one of the most often used constructs with the strongest explanation powers supported. For example, Hsu *et al.* (2006) studied the acceptance of mobile coupons and found that perceived usefulness has the most significant resulting influence to attitudes, which is aligned with findings of Davis (1989). Similarly, strong influence was supported by Hung *et al.* (2003) in their research on WAP acceptance and Merisavo *et al.* (2007) concluded that perceived utility, which is very similar to perceived usefulness, has a very strong link to the willingness to accept mobile advertising. Pagani (2004), in turn, also supported in her conjoint analysis of attributes influencing adoption of mobile multimedia services that perceived usefulness is the most important factor, although after certain age it becomes less relevant and ease of use becomes more important. Due to the pervasive nature of the perceived usefulness construct in historical adoption research and mobile marketing research and its wide support, it is confidently proposed that:

> **H3:** Perceived usefulness is positively related to attitude toward using location-based advertising.

3.2.4. Perceived Ease of Use

Since mobile devices have gone through major technological developments in the near past, it can be argued that their usage has also become more complex as mobile devices include more features than ever before. The complexity of mobile devices and mobile broadband are factors that could influence the acceptance and adoption process. Ease of use is defined as "the degree to which a person believes that using a system would be free of effort" (Davis, 1989). Generally, people perceive that using a new system will bring benefits (perceived usefulness) but if they believe it is too difficult to use and the performance benefits are smaller than effort of using, the attitude toward the usage will be negative. Pagani (2004) proposed following four factors influence users' perceived ease of use in mobile multimedia service context.

- Input device - the different types of input methods
- Output device - different screen size will affect the ease of use of a mobile device
- Software facilities - few and clear steps, graphic layout, clear commands and symbols, help functions
- Bandwidth - directly affects system response time, which in turn, affects perceived ease of use.

Not only the actual difficult usage count to perceived ease of use, but, e.g. in the context of location-based services, also the registration process, learning about privacy policy, and terms and conditions may also inhibit someone to subscribe to the service, as the effort seems higher than the benefit (Xu & Gupta, 2009).

Perceived ease of use along with perceived usefulness are the only constructs that influence attitude in the original TAM framework (Davis, 1989; Davis *et al.,* 1989). Perceived ease of use construct can also be found in IDT theory as complexity and in Moore and Benbasat's (1991) work as the ease of use construct. These studies among others, have found a significant relationship between ease of use and attitude/intentions. Findings show that perceived ease of use is more strongly related to intention to use goal-directed mobile services than to experimental services (Nysveen *et al.,* 2005). Location-based advertising cannot be clearly classified into just goal-directed or experimental service. Location-based advertising is a goal-directed service in which the goal is to conveniently receive relevant advertising, information and economic benefits. On the other hand, the location-based services that are needed to access location-based advertising are experimental services that are used for personal enjoyment but also for information search and goal directed purposes. This multidimensional nature of location-based advertising makes it an interesting application to research. Hence, it is hypothesized that:

> **H4:** Perceived ease of use is positively related to attitude toward using location-based advertising

3.2.5. Perceived Enjoyment

Perceived enjoyment, perceived entertainment or other similar constructs are much more rare in the adoption of IS literature. In the mobile context, this construct is important, although more research is needed to understand its relative importance. The convergence of technology and media has made mobile devices entertainment units that people use on the go. Many play games, read news, and watch TV on their mobile phone. Perceived enjoyment differs from perceived usefulness because it satisfies more hedonistic needs and is driven by different underlying motives. It refers to being fun, engaging, and exciting, rather than necessarily helping to make certain tasks more efficient and easier than before.

The importance of perceived enjoyment has been evidenced in mobile marketing research (Bauer *et al.,* 2005; Tsang *et al.,* 2004; Pagani, 2004; Dabholkar & Bagozzi, 2002). Although this construct has not received as much attention as attitude, usefulness and other constructs found in TAM and TRA, it is important to include this construct into the model. By introducing expressiveness and enjoyment to the adoption model there is an increase in the explained variance (Nysveen *et al.,* 2005). Since location-based advertising doesn't symbol directly the style or fashion of the user, the expressiveness construct is not going to be used in this study. In addition, this is partly measured in social influence. Nysveen *et al.* (2005) also found no significant support between perceived expressiveness and attitude toward using a mobile service. However, enjoyment was found to be a significant determinant for attitudes towards self-service technology in fast food restaurants (Dabholkar and Bagozzi, 2002). Furthermore, Tsang *et al.* (2004) found that entertainment is positively correlated to attitude toward mobile advertising.

By examining uses and gratification theories we can bring more depth and validation to the enjoyment construct and to the whole adoption model. The idea behind gratification theory is that people seek gratifications in media and technology use based on their needs and motivations (Lin, 1996 cited Nysveen *et al.*, 2005). It is a rational process that explains behavioral intention and therefore can be integrated to the TRA based model. Several motivations in uses and gratifications research are indicated to be similar to perceived usefulness and ease of use, discussed above, but more importantly, also enjoyment, fun seeking, entertainment, fashion status and sociability are indicated as significant motivations to use mobile services (Nysveen *et al.,* 2005). Thus:

> **H5:** Perceived enjoyment is positively related to attitude toward using location-based advertising.

3.2.7. Compatibility

The compatibility construct is adopted from Rogers (1995) innovation diffusion theory. Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopter" (Rogers, 1995). Adopting from Moore and Benbasat (1991) as well as Ajzen and Fishbein (1980), this study will not measure the perceived characteristics of an innovation *itself,* but the perceptions of *using* the innovation to give most accurate results.

Rogers (1995) theorized that the perception of using an innovation could be compatible or incompatible in three ways. First, compatibility can be measured in terms of sociocultural values and beliefs. Incompatibility with cultural values will block the adoption of innovations. For location-based advertising it is important to understand how it fits culturally as an advertising channel as well as how sharing ones location information to others is fit to the current culture. Mobile phones are very private and therefore advertising through this medium is often seen as more intrusive than other channels reflecting incompatibility currently. Also, sharing location information for some is very incompatible, but for others it is normal behavior. Whether something is compatible or not often varies between the characteristics of individuals and time. It is assumed that privacy, for example, is a changing concept since some are very used to documenting their life on the web through social networking websites, while others find this out of the question. Secondly, compatibility can be embedded in previously adopted ideas and experiences. The adoption rate of an innovation can speed up if it is compatible with something it supersedes. According to Rogers (1995), old ideas are the main "mental tools" that individuals use to assess new ideas and give them meaning. SMS advertising with no location-awareness can be considered the predecessor of location-based advertising. Since the general public has little experience in this, advertising through different channels is a better comparison. Furthermore, location-awareness and highly targeted advertisements have yet to fully reach the general public. Thirdly, the compatibility of an innovation can be the degree to which it meets a need. Location-based advertising represents an innovation that the public is mostly unaware of and therefore possibly the need is not realized.

Examining compatibility as a determinant of attitude will allow understanding of whether people believe, in general, that location-based advertising is a fit to their existing values and beliefs. Although compatibility is a very rarely used construct in the mobile adverting context it has been used in other fields in the past and has been found a significant predictor of adoption (Rogers, 1995). It is believed that by incorporating compatibility to the proposed model as a separate construct, the predictive power of the adoption model will increase and provide added insight to the beliefs and values of people. Thus, it is proposed that:

H6: Compatibility is positively related to attitude toward using location-based advertising.

3.2.6. Incentives

Incentives have been used in advertising for decades to drive consumer demand and traffic to stores. These incentives are often in the form of special discounts on products and services and/or loyalty programs that offer rewards for buying frequently in a given establishment. Location-based advertising allows marketers to provide consumers "mobile" coupons that can be redeemed to gain economic benefits. Offering "mobile" coupons can be very lucrative for marketers, as the cost of offering these "coupons" has decreased dramatically with the digital and mobile age. Also, the ROI on these campaigns can be measured more easily and marketers can target highly segmented groups with offers that are relevant to that particular homogeneous group of people. There has also been a push to offer customers incentives not in the form of discounts. For example, Foursquare encourages usage and participation by giving it's loyal user digital "badges" that are worthless in terms of currency, but posses social and hedonistic value for some.

The positive relationship between incentives and attitudes has been empirically supported in the mobile advertising context (e.g. Dickinger & Kleijnen, 2008). Rettie *et al*. (2005) studied 26 mobile advertising campaigns and found that monetary incentives have a strong effect on acceptance of mobile advertising. Furthermore, the effect of incentives toward intentions to allow mobile advertising was supported by Tsang *et al.* (2004). Merisavo *et al.* (2007) also included "monetary savings" in perceived usefulness construct (named perceived utility in their study) and found significant relationship to acceptance of mobile advertising. Hanley and Becker (2008) found that the use of incentives is the single most important motivation to accept ads on their mobile phones. By having a separate construct for incentives, the relative weight to other factors can be realized. Thus, it is proposed that:

H7: Incentives are positively related to attitude toward using location-based advertising.

3.2.8. Innovativeness

Rogers (1995), in his meta-analysis of variety of innovations across different domains and contexts, has highlighted the importance of the personality trait of innovativeness in the adoption and diffusion process. He identified five adopter categories that are based on personal innovativeness that, in turn, are conceptualized by the time of adoption. Rogers' (1995) innovator, early adaptor, early majority, late majority, and laggard categories have been afterwards frequently used in marketing theory and practice. People in these categories have specific characteristics according to Rogers (1995) such as

being more active information seekers, enduring higher uncertainty and less reliance on the influence of social circles. In adoption research, none of the main theories (TAM, TRA, UTAUT) explicitly use innovativeness as a construct to predict and understand behavior with exception of Agarwal and Prasad (1998). They defined innovativeness as "the willingness of an individual to try out new information technology" which will also be adopted by this study. This definition follows the concept of domain specific innovativeness that is found to have stronger predictive power than global innovativeness that all people have to a certain extent (Goldsmith and Hofacker, 1991 cited in Agarwal and Prasad, 1998). Agarwal and Prasad (1998) examined the role of innovativeness as the key moderator for the antecedents as well as the consequences of three of Rogers' factors on intention (see Figure 1.). Although the only significant moderator effect was found for compatibility, they provided ground braking conceptual and operational definition to the construct of personal innovativeness for future research in information technology.

Following Agarwal and Prasad and Roger's work, the personal innovativeness construct is incorporated into this research. The inclusion of this variable brings more depth to the research as it is expected that personal innovativeness has strong influence on the attitude toward using location based-advertising due to the high technical knowledge needed from the user and novelty status of such advertising today. Thus,

> **H8:** Personal innovativeness is positively related to attitude toward using location-based advertising.

3.2.9. Privacy Concerns

Warren and Brandeis (1890), writers of " the right to privacy", which can be considered one of the most influential essays in the history of American law, described privacy as "the right to be left alone" (Cited in Phelps, Nowak & Ferrell, 2000). Alan Westin (1967), another American privacy pioneer and advocate, wrote that privacy is "the claim of individual, groups or institutions to determine for themselves when, how, and to what extent information about them is communicated to other". Marketers and consumers often perceive privacy in terms of information control revolving around questions such as do third parties have access to personal data, how is the data used and what sort of advertising and marketing arises from the use of personal data (Phelps, Nowak, & Ferrell, 2000). In other words, privacy is often associated with keeping personal data safe and protecting peoples identity in terms of name, social security number and purchase behavior (Barkhuus & Dey, 2003).

In the context of location-based advertising, issues regarding location data and how people perceive sharing their location information with their social relations widens the description of privacy discussed above. Privacy in terms of location-based advertising does not only include data concerning

identity, as described in previous paragraph, but also location data. Concerns regarding location data are often associated with others being able to monitor where the user is at all times, and this is magnified in the digital age and smart phone era when tracking people via applications has become almost a "norm". This, in turn, raises the question of personal safety and peoples' willingness to provide this information. Location data and personal data are important elements in order to provide targeted advertising and services, and are already present in many applications of location-based services. Thus, both should be included in the definition for this context.

Research on privacy and e-commerce is not conclusive in the context of mobile marketing. The general assumption is that privacy concerns play a big role in peoples' lives. A number of studies have concluded that privacy is a major factor influencing peoples' attitudes toward electronic services and adoption of such services (Chellappa & Sin, 2005; Dinev & Hart, 2006; Malhotra *et al.*, 2004). Other studies have concluded that privacy concerns exists, but have little impact on consumers' behavior. In the context location privacy, several studies have explored how much users value their location information and their willingness to disclose location to social relations (Consolvo *et al.*, 2005; Danezis *et al.*, 2005; Grossklags *et al.*, 2007). What combines these studies is the findings that although people are concerned with privacy issues, they are not willing to pay extra for protecting their privacy and often value their own privacy very little, e.g. they are willing to sell or "give away" their privacy for very low price.

Other categories of relevant studies explore consumers' perceived privacy concerns in different types of location-based services and between potential and experienced users (Barkhuus, 2004; Barkhuus & Dey, 2003; Xu & Gupta, 2009). Barkhuus & Dey (2003) take the approach of examining peoples' location privacy concerns by dividing location-based services into location-tracking and position-aware services. Location tracking services allow other parties, such as individuals or service providers, to track people's location, while position-aware services are based on the device's own knowledge of it's position, such as automatically changing the time on a mobile devices when entering a new time zone. They found that people are not "overly concerned" by using location-based services in general, but location-tracking services were found to be more "intrusive" compared to position-aware services, supporting the general notion that people are more concerned by others tracking their location (Barkhuus & Dey, 2003). In mobile advertising research, Merisavo *et al* (2007) similarly found that consumers do not consider privacy issues "very important" and concluded that trust privacy has little impact in the acceptance of mobile advertising. These findings can not be directly compared with location-based advertising since the description of privacy didn't consider location data privacy, but focused on trust people have that their private information is kept secured and used in a manner as agreed with customers' permission.

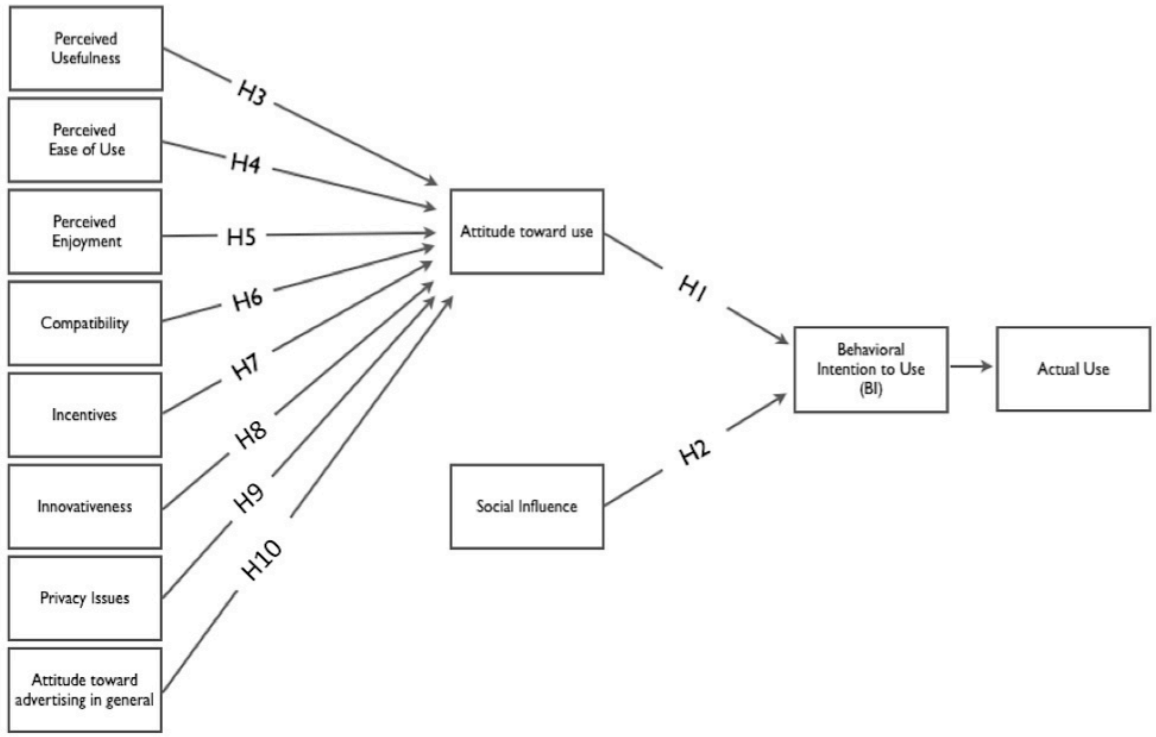
Controversy exists between at least two studies on the perceived privacy concerned when comparing potential location-based service customers and customers that have used these services. It has been proven that people tend to have higher privacy concerns when they are described a possible location based application, but when they are actually using the service the privacy concerns become less threatening and people are more likely to accept them than first assumed (Barkhuus, 2004). On the other hand, research by Xu & Gupta (2009) indicates that privacy concerns are more significant with experienced customers than with potential users. This means that for marketers it is important to continue to develop the privacy aspect in order to maintain continuous adoption of these services.

Based on the review of privacy research in the context of mobile marketing, e-communication and location-based services, the privacy concerns construct is added to the model. Due to the essence of location-based advertising, privacy concerns are expected to influence how people form attitudes toward such services. In other words, the more privacy corners the lower positive attitude toward using location-based advertising. By incorporating privacy corners to the model, the goal is to shed more light in the field of privacy literature and understanding the importance of it in the context of adoption of new technologies and services. Thus, it is hypothesized that:

H9: Privacy concerns are negatively related to attitude toward using location-based advertising.

3.3. Research model and summary

Figure 5. Hypothesized relationships of location-aware advertising acceptance constructs



H1: Attitudes toward using location-based advertising are positively related to consumer intentions to use location-based advertising.

H2: Social influences are positively related to intentions to use location-based advertising.

H3: Perceived usefulness is positively related to attitude toward using location-based advertising.

H4: Perceived ease of use is positively related to attitude toward using location-based advertising.

H5: Perceived enjoyment is positively related to attitude toward using location-based advertising.

H6: Compatibility is positively related to intentions to use location-based advertising.

H7: Incentives are positively related to attitude toward using location-based advertising.

H8: Personal innovativeness is positively related to attitude toward using location-based advertising.

H9: Privacy concerns are negatively related to attitude toward using location-based advertising.

H10: Attitude toward advertising in general is positively related to attitude toward using location-based advertising.

4. Methodology

The purpose of this study is to test the proposed conceptual model empirically. In addition, studying the relationships of the core constructs is an important part of this research. Since the core constructs have been validated in previous research but not in this particular context, a quantitative research approach was chosen to examine the proposed model and find out the factors that influence the adoption of location-based advertising. Structural equation modeling (SEM) technique was used in the analysis. Many applications of SEM are mixtures of exploratory and confirmatory analyses and the distinction between them is not clear-cut (Kline, 2005; Anderson and Gerbing, 1988). This study can be considered confirmatory in that it uses latent variables or core constructs and indicators from existing adoption literature in measurement. On the other hand, new constructs are combined with old ones to build a completely new model for location-based services for mobile technology. The purpose of this research is to determine whether the model is supported by the data. From this information other inferences can be made that have managerial and theoretical implications.

4.1. Data collection

Data for the research was collected through a web-based survey that was distributed to a sample of 328 individuals via Facebook. Although the sample is non-random and represents a social network of the researcher, it is valid to test the proposed model, but not to make generalizations about the public. The survey yielded 138 completed responses that represents 42% response rate. There is no exact rule as to how many respondents are needed to conduct SEM, although according to Kline (2005), less that 100 respondents is a small sample that can be only used to analyze simple models. 100-200 in turn, represent medium sample and allows for analysis of more complex models. Kline (2005) also suggested higher than 10:1 ratio for respondents to the number of free parameters. In this research the respondent-parameter ratio is 13:1, so it can be concluded that the sample size is adequate.

The respondents' gender distribution was fairly even; 56% men and 43% women (see table 3). The biggest age groups were 26-33-year-olds (56%) and 19-25-year-olds (39%). The age distribution is explained by the Facebook sample that consisted of the researcher's social network, representing, for the most part, people with similar age. The sample consist 18 different nationalities that were later grouped into four categories. Finns were the biggest majority 64%, then North Americans (12%) and Italians (10%). The sample is largely represents highly educated individuals as 71% of them have either Bachelor's or Master's degree. Majority of the respondents (65%) have experience in some sort of location-based services in that they have heard of or used some services while (36%) have no experiences or have not heard of them.

Table 3 shows the mean and standard deviation of each construct. Consumer *attitudes toward location-based advertising* are generally positive as well behavior intention to adopt these services in

the near future. *Perceived usefulness* and *perceived ease of use* had the highest mean as anticipated. Also *incentives* and *perceived enjoyment* had high mean value. By examining mean values, *privacy issues* scored one of the highest, meaning that respondents are concerned with how companies use their private information, including location data.

Table 2. Demographic Characteristics of the Respondents (n=139)

Demographic characteristic	*Number of respondents*	*%*
Gender*		
Male	78	56.5
Female	68	43.5
Age*		
0-18	1	0.7
19-25	54	39.1
26-33	77	55.8
34-41	4	2.9
42-49	2	1.4
50 or above		
Level of Education*		
Comprehensive school	2	1.4
Vocational school	16	11.6
High school	22	15.9
Bachelor's degree	52	37.7
Master's degree or PhD	46	33.3
Country **		
Finland	82	63.6
North America	16	12.4
Italy	13	10.1
Other	18	14
Experience*		
Yes	89	64.5
No	49	35.5

* Missing 1
** Missing 10

Table 3. Means and Standard deviations

Construct	*Mean*	*Std dev.*
Behavioral Intention	4.59	1.38
Attitude	4.99	1.35
Social Influence	3.69	1.38
Compatibility	4.13	1.51
Perceived Usefulness	5.46	1.12
Perceived Ease of Use	5.71	1.11
Enjoyment	4.42	1.48
Incentives	4.97	1.38
Innovativeness	4.54	1.62
Privacy Issues	5.29	1.50
Attitude toward ads	3.97	1.63

4.2. Survey development

Since location-based advertising and location-based services are still in their infancy of commercial development, most consumers have little experience and knowledge of the possibilities they offer and therefore, the adoption has not yet happened in large scale. Furthermore, since the adoption has not yet happened in large scale it is difficult or impossible to research new technologies and their adoption in the society. Since it is important to study innovative and emerging technologies, this study takes the approach of studying future acceptance. Respondents are introduced to a real-life scenario that involves location-based advertising in a day-to-day setting and later, respondents are asked to answer the questions based on how they feel about the scenario. The scenario is presented in Appendix 1.

Based on existing adoption, mobile marketing, social behavior and advertising literature, 10 core constructs were identified to be relevant to the context of this study (see Table 3). Based on the constructs, a conceptual model (see figure 5) was developed and the model was used to build up a questionnaire. These core constructs are hypothetical constructs and unobserved. This means that they are measured through observed variables called indicators. Multiple indicators (minimum 3) per construct were used to get more realistic and reliable scores and to enhance score validity by having multiple indicators to measure different facets of each construct (Kline, 2005). The constructs for the proposed model and the indicators for each construct were selected based on an extensive literary review. Some of the indicators were taken directly from existing research and some were adopted to fit the location-based advertising context. These contrasts can be found in variety of studies by different researchers with small variance in their description. Therefore, the most appropriate construct description was used for this study. For example, the *behavior intention* item was taken from Venkatesh (2003), but modified to be less specific. The original indicator states: "I intent to use this service in the next 6 months". Since there is much ambiguity in the future and availability of location-based advertising, 6 months was changed to "in the near future". *Compatibility,* in turn, was adopted from Moore and Benbasat (1991) and *perceived ease of use* and *perceived usefulness* from Davis (1989)(see Table 4 for full list of items for each construct). In order to capture the true nature of location-based advertising, indicators to existing constructs were added by the researcher, which also adds to the exploratory aspect of this research as mentioned earlier.

All scales were measured on a 7-point likert scale in which 1 equals "Strongly Agree" and 7 equals "Strongly Disagree". These scales were later reversed so that higher number represents positive agreement and higher likelihood of adoption. Three scores were reversed to make sure no bias exists and to see if respondents are consistent with their answers. The survey was also administered in Finnish and much consideration was put into the wording of the indicators so that they would measure exactly what they do in English. The survey design was pre-tested with group of five university

students and wording revised. Another pre-test was administered for three business school students and the survey design was found suitable for wider release. The final questionnaire included 38 questions regarding location-based advertising and five demographic questions.

5. Data analysis and results

This chapter will present the approach taken to analyze the data. The structural equation modeling technique was used with the Amos 19.0 software to analyze the data and validate the model. The measurement model is discussed first, followed by the structural model.

5.1. Evaluating the measurement model

The two-step approach suggested by Anderson and Gerbing (1988) was used to evaluate the quality of the measures and the structural model. First, item loading was analyzed to assess convergent validity. Then, reliability was investigated through composite reliability (CR) and average variance extracted (AVE). Finally, discriminant validity was explored

The measurement model was made in conjunction with structural model. Before testing the structural model, the measurement model must be demonstrated to have a satisfactory level of validity and reliability (Fornell and Larcker, 1981). After the data collection, Amos 19.0 was used to administer a confirmatory factor analysis (CFA) and evaluate the measures. The purpose of this was to measure how well indicators (observed variables) represent the core constructs (latent variables). Two indicators did not load well with the intended construct and were removed from the model. Retrospective examination revealed that both indicators "Location-based advertising is aligned with the society today where people are reachable anytime and anywhere" and "I prefer mobile phone applications that are entertaining" were too general and distorted the loadings. All except four indicators (see table 4) loaded above the threshold of 0.60, which is considered the cut-off point (Kline, 2005). Nevertheless, the indicators that were below were not rejected because they were near the cut-off level and did not have a significant effect on the model fit.

Table 4. Construct, Indicators, Composite reliability, Std factor loading

Construct, Indicators and Composite reliability*	*Std factor loadings***	*Based on*
F1: Behavioral Intention (composite reliability, α=0.915)		
[BI1] I intend to use location-based advertising immediately when it is available	0.870	Venkatesh *et al.* (2003)
[BI2] I would use location-based advertising in the future	0.882	Venkatesh *et al.* (2003)
[BI3] I plan to use location-based advertising when it is available	0.902	Venkatesh *et al.* (2003)
F2: Attitude (α= 0.865)		
[A1] My attitude toward using location-based advertising is positive	0.956	Ajzen & Fishbein (1980)
[A2] I believe using location-based advertising is bad*	0.794	Researcher
[A3] I like the idea of using location-based advertising	0.713	Researcher

F3: Social Influence (α= 0.766)		
[S1] My friends would think that I should use location-based advertising.	0.676	Ajzen & Fishbein (1980)
[S2] It is expected that people like me would use location-based advertising.	0.633	Nysveen *et al.* (2005)
[S3] Using location-based advertising would improve my image among my peers.	0.708	Moore & Benbasat (1991)
[S4] If I would use location-based advertising most of my friends would regard me as clever.	0.665	Researcher
F4: Compatibility (α= 0.741)		
[C1] Using location-based advertising would be compatible with all aspects of my life	0.620	Moore and Benbasat (1991)
[C2] Using location-based advertising would fit into my lifestyle	0.744	Moore and Benbasat (1991)
[C4] I think it is wrong that companies can locate my mobile phone, even if the data is safe from wrongful access*	0.584	Researcher
[C5] Mobile phones should not be used for advertising purposes*	0.632	Researcher
F5: Perceived Usefulness (α= 0.722)		
[PU1] I would find receiving advertising messages based on my interests, location and time useful	0.711	Davis (1989)
[PU2] Using location-based advertising would make my shopping more efficient	0.784	Davis (1989)
[PU3] Using location-based advertising would make me better informed about relevant products and services in my vicinity	0.539	Researcher
F6: Perceived Ease of Use (α= 0.783)		
[PEU1] I would find location-based advertising application easy to use	0.757	Davis (1989)
[PEU2] Learning to use location-based advertising application would be easy for me	0.835	Davis (1989)
[PEU3] Mobile phone applications are difficult to use *	0.617	Researcher
F7: Perceived Enjoyment (α= 0.864)		
[PE1] I would find receiving advertising based on my location and needs entertaining	0.905	Nysveen *et al.* (2005)
[PE2] I would find receiving location-based advertising exiting	0.808	Nysveen *et al.* (2005)
[PE3] The ability to interact with the advertisement would be fun	0.753	Researcher
F8: Incentives (α= 0.822)		
[I1] Using location-based advertising can save my money	0.689	Mittal (1994)
[I2] I believe that the financial gain from using location-based advertising is worthwhile	0.888	Dickinger and Kleijnen (2008)
[I3] I think that saving money is important in location-based advertising	0.750	Merisavo *et al.* (2007)
F9: Innovativeness (α= 0.880)		
[IN1] If I heard about a new information technology, I would look for ways to experiment with it	0.854	Agarwal and Prasad (1998)
[IN2] Among my peers, I am usually among the first to try out new information technologies	0.805	Agarwal and Prasad (1998)
[IN3] I like to experiment with new information technologies	0.867	Agarwal and Prasad (1998)
F10: Privacy Issues (α= 0.808)		
[PI1] It bothers me to disclose my personal information to service providers	0.826	Smith *et al.* (1996)
[PI2] I am concerned that other people may monitor my current location continuously	0.857	Smith *et al.* (1996)
[PI3] Service providers might share my personal information (including my location) with other companies without notifying me or getting my authorization	0.612	Smith *et al.* (1996)
[PI4] Service providers may keep my private information (including location) in a non-secured manner	0.541	Smith *et al.* (1996)
F11: Attitude Toward Advertising in General (α= 0.772)		
[Aadv1] In general, advertising (TV, magazine, etc.) helps me keep up-to-date about products and services that I need or would like to have	0.701	Mehta (2000)
[Aadv2] I like to look at advertising in general (TV, magazine, etc.)	0.888	Mehta (2000)
[Aadv3] Much of advertising is way too annoying (in TV, magazines, etc.)	0.578	Mehta (2000)

Note: CFA model goodness-of-fit indexes: ($\chi 2$)=993.971 and with degree of freedom (d.f.)=539; comparative fit index (CFI)=0.851; Normed fit index (NFI)=0.730; root mean square of approximation (RMSEA)=0.078; 90% confidence of RMSEA (0.071; 0.086).
* 7- point Likert scale was used in data collection in which 1= strongly agree and 7= strongly disagree
** All the loadings are significant at $p < 0.01$

Next, the psychometric properties of each measure were investigated. According to Fornell and Larcker (1981) among others, properties of interest are reliability (Convergent Validity), Average Variance Extracted (AVE) and discriminant validity. The composite reliability (CR) in all the measures is above the recommended 0.70 threshold (Kline, 2005) (see table 4). The range of CR is from 0.72 to 0.92. These values support the internal validity of the measurement model and that the constructs and indicators are related. Most of the measures also had AVE score above the 0.50 threshold, except *Social Influence, Perceived Usefulness* and *Compatibility* (see table 5). The

threshold of 0.50 is proposed by, Fornell and Larcker (1981) among others. This suggests satisfactory convergent validity. Furthermore, Fornell and Larcker (1981) procedure was then administered to prove discriminant validity of the model. The square root of AVE for each construct is presented on table 5 on the diagonal line in bold numbers to demonstrate that constructs are both conceptually and empirically distinct from each other.

Table 5. Correlation matrix, AVE and AVE square root (bolded)

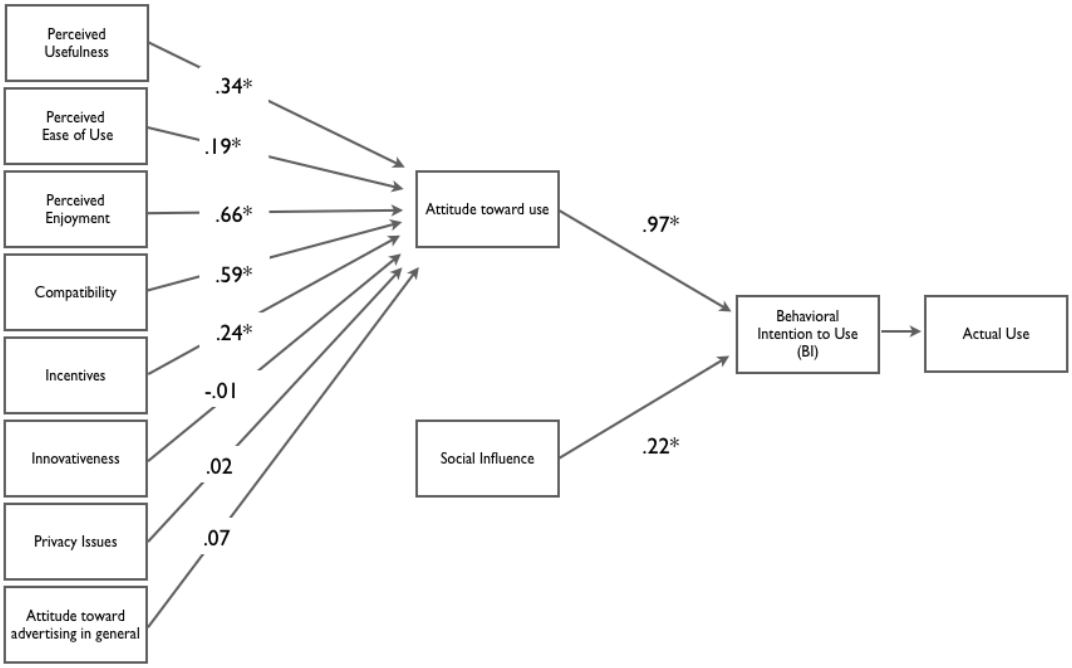
Construct	*AVE*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Privacy Issues	0.521	**0.72**										
2. Behavior Intention	0.783	-0.19	**0.88**									
3. Attitude	0.684	-0.31	0.85	**0.83**								
4. Social Influence	0.450	-0.13	0.78	0.73	**0.67**							
5. Compatibility	0.420	-0.48	0.87	0.89	0.77	**0.65**						
6. Perceived Usefulness	0.470	-0.07	0.71	0.75	0.72	0.80	**0.69**					
7. Perceived EaseofUse	0.550	-0.19	0.40	0.29	0.24	0.35	0.14	**0.74**				
8. Perceived Enjoyment	0.680	-0.13	0.82	0.79	0.73	0.81	0.62	0.20	**0.82**			
9. Incentives	0.609	-0.29	0.81	0.74	0.69	0.84	0.70	0.38	0.62	**0.78**		
10. Innovation	0.710	-0.08	0.54	0.37	0.53	0.42	0.25	0.62	0.47	0.40	**0.84**	
11. Attitude Toward Ads	0.538	-0.12	0.51	0.50	0.55	0.53	0.34	-0.08	0.56	0.42	0.19	**0.73**

The measurement model was assessed with several model fit indicators Kline (2005) proposes. RMSEA value for model fit is 0.078 (see table 4). That falls between 0.05 and 0.08 that represents "reasonable error of approximation" (Kline, 2005). The comparative fit index (CFI) is 0.851, which is close to the good fit value of > 0.90. Chi-square is 993,971 and with degrees of freedom is 539, furthermore, $\chi 2/df$ is then 1.84 which also below the maximum value of 3 . P-value is 0.00. After the measurement model assessment, the structural model was investigated to test the proposed hypothesis that is discussed in the next paragraphs.

5.2. Testing the structural model

Structural equation modeling was next used to test the proposed framework, test the hypotheses and understand what are the most important factors that influence consumer adoption of location-based advertising. Hypothesis tests were conducted by examining the significance of the path coeffients. As with the measurement model, several model fit indicators were used to assess the validity and reliability of the structural model. The indicators were as follows: RMSEA = 0.110, CFI = 0.679, NFI = 0.575, $\chi 2$ = 1563.107, df = 586, $\chi 2/df$ = 2.67, Significance = 0.00. The model fit can be regarded as acceptable and therefore the model can be accepted and will allow testing of all of the hypotheses in next section. Figure 6 and table 6 present the results and the model including path coefficients.

Figure 6.
Final Model



Note: Structural model goodness-of-fit indexes: (χ2)=1563.107 and with degree of freedom (d.f.)=586; comparative fit index (CFI)=0.679; Normed fit index (NFI)=0.575; root mean square of approximation (RMSEA)=0.110; 90% confidence of RMSEA (0.104; 0.117).
* p<0.05

Table 6. Hypothesis testing results

Path	*Standardized estimates*	p-value	Hypothesis
A → BI	0.97	<0.01	H1: Supported
S → BI	0.22	<0.01	H2: Supported
PU → A	0.34	<0.01	H3: Supported
PEU → A	0.19	<0.05	H4: Supported
PE → A	0.66	<0.01	H5: Supported
C → A	0.59	<0.01	H6: Supported
I → A	0.24	<0.01	H7: Supported
IN → A	-0.01	0.901	H8: Not supported
PI → A	0.02	0.759	H9: Not supported
Aadv → A	0.07	0.205	H10: Not supported

Note: A=attitude, BI=behavioral intention, S=social influence
PU=perceived usefulness, PEU=perceived easy of use, C=compatibility
I=incentives, IN=innovation, PI=privacy issues, Aadv=attitude toward ads

5.3. Results

The findings provide support to the direct effects of attitude and social influence on intentions to use location-based advertising in the future (supporting H1 and H2). This confirms the acceptance of constructs conceptualized in previous adoption research, such as Theory of Reasoned Action (Ajzen and Fishbein, 1980) and Technology Adoption Model (Davis *et. al,* 1989). *Attitude* toward using location-based advertising strongly determines the behavioral intention to use location-based advertising in the future (H1). This relationship is very strong with path coeffient of 0.97. Similarly, *social influence* influences positively the behavioral intention to adopt location-based advertising, but the relationship is relatively much weaker (B=0.22).

The influences of two indirect constructs (*perceived usefulness, perceived ease of use*) conceptualized in Technology Acceptance Model (Davis, 1989) were also confirmed (supporting H3 and H4). *Perceived usefulness* observed a very strong path (B=0.34) while *attitude* and *perceived ease of use* also had had a strong positive path (B=0.19). Therefore, the findings validate the importance of Davis' (1989) two key constructs from his highly noted research on technology adoption.

The importance and relative strength of *perceived enjoyment* was evidenced as Nysveen *et al.* (2005) suggested in their research on mobile services and Tsang *et al.* (2004) in their work on mobile advertising. The path coefficient between *perceived enjoyment* and *attitude toward using location-based advertising* was 0.66 and thus, Hypothesis 5 was supported. It is the second strongest relationship only after the *attitude* construct, which has been studied much more frequently in adoption literature. *Perceived enjoyment* is the strongest determinant of people's attitude toward using location-based advertising and indirectly influences adoption. This information is highly valuable to marketers, because it empirically validates that consumers use mobile phones to look for enjoyment and prefer applications that provide them enjoyment rather than only using them for information and communication purposes. Similarly, Hypothesis 6 was supported, as a very strong path (B=0.59) from *compatibility* to *attitude toward using location-based advertising* was found, suggesting that location-based advertising is aligned with today's world, its norms, and that consumers find it appropriate to use mobile phones as advertising medium in which location and context aware advertising is sent.

In Hypothesis 7, it was predicted that economic incentives/benefits are positively related to *the attitude toward location-based advertising.* This hypothesis is supported by a strong positive path (B=0.24). Similarities can be drawn from the research of traditional coupons and more recent phenomenon, mobile-coupons. Dickinger and Kleijnen (2008) also found that economic benefits influence attitude that in turn affects positively the intention to redeem a mobile coupon.

Surprisingly and contrary to many existing research articles, *personal innovativeness* and *privacy issues* did not have significant indirect relationships to adoption of location-based advertising, thus Hypothesis 8 and Hypothesis 9 were not supported. In addition to these two constructs being found statistically insignificant (high p-value), they also had, relative to other constructs, very weak path coeffient (B=-0.01 and B=0.02, respectively) to adoption of location-based advertising. Privacy issues were hypothesized to negatively relate to attitude toward location-based advertising: a higher concerns of ones privacy would decrease ones attitude toward location-based advertising. The relationship was insignificant but it was not negative. Similarly, ones personal level of innovativeness was expected to have positive relationship with attitude toward location-based advertising: higher level of personal innovativeness would have better attitude toward location-based advertising. This was also found insignificant and the relationship was very weak and negative.

Attitude toward advertising was also hypothesized to have positive relationship to attitude toward location-based advertising. This relationship was found statistically insignificant and thus, Hypothesis 10 was not supported.

To summarize, relatively strong empirical evidence was found for the hypotheses tested, except Hypothesis 8-10, which were rejected. This study shows that attitude toward using a service/product is important in the context of mobile services when studying their adoption. *Perceived enjoyment* is in turn the most important function of attitude that indirectly influences adoption. Constructs and relationships from Technology Acceptance Model and Theory of Reasoned Action were also found suitable in the mobile service context. The results also suggest that incentives and compatibility positively affect attitude toward using location-based advertising. Since personal innovativeness and privacy issues were not found statistically relevant and the relationship was weak, further research is warranted to better comprehend their role in the adoption mobile services.

6. Conclusions

6.1. Discussion

The research presented here was motivated by an interest to provide a modified and an extended framework that can be used to forecast and understand the adoption of new mobile services, especially location-based advertising. The purpose was to analyze a particular kind of location-based service in order to gain deeper knowledge to the relatively new field of location-based research as Kaasinen (2003) proposed. The study contributes to the contemporary adoption and marketing research by offering insight on the important factors that affect consumer decision making when they choose to adopt or not to adopt new and innovative mobile services into their every-day lives. In addition, this study validates constructs used in a variety of adoption studies in a different setting to fit the context of mobile services. Traditional constructs based on TAM (Davis, 1989) and TRA (Ajzen and Fishbein, 1980) – perceived usefulness, perceived ease of use, social norm and attitude – explain mobile service usage, however, they don't capture all the facets of complexity in the mobile location-based service context. Adding new constructs and combining old models created a new modified model that included constructs such as enjoyment, incentives, privacy issues and innovativeness to capture the true essence of these new services.

The failure of location-based services in the market in the past has been explained by many reasons, one of them being weaknesses in offered services, technology and infrastructure (Khurri & Luukkainen, 2009). Another plausible explanation for the past failure is that consumers were not aware or not ready for this sort of innovation. This was also found in this research since only around 60% of the respondents had ever used or heard of location-based services (excluding GPS navigation). The respondents were relatively young, therefore the usage and awareness was expected to be much higher. It is further assumed that older generations have even less knowledge of the existence of such services. Consumers are interested in services that utilize location data with the right context (e.g. Gransaether *et al.*, 2010; Jones & Grandhi, 2005). It was found that the respondents of this study were not only interested but believe that the time is right for location-based advertising. Wireless infrastructure, mobile phones, and their users have evolved and mobile phones are perceived as an acceptable medium to advertise and collect individual information to provide customized advertisement based on location and other characteristics (Hypothesis 6).

One of the most intriguing and important findings of this research was how strong of a relationship exists between *enjoyment* and *behavioral intention* in this context (Hypothesis 5). The strong relationship of this relatively untraditional antecedent underscores the inclusion of this particular construct when location-based services are under examination. Even though advertising and watching

ads are not often associated with adjectives such as fun and entertaining, in the context of location-based advertising this was evidenced to be one of the most important factors. Plausible explanation is that in today's world the use of mobile phones is driven by hedonistic motives rather than purely communicational, informational and utilitarian motives. Mobile phone applications and services are expected to fulfill these internal motivations. This phenomenon can also be observed in the market. Mobile phones are a platform for a new category of games and gamification of mobile applications and services that can be observed in many categories of mobile services offered. This was also found in this research, as respondents that expect to be entertained while using location-based advertising application are highly likely to adopt that service. This finding is not just an anomaly. Nysveen *et al.* (2005) and Tsang *et al.* (2004) also find evidence of the importance of this variable in their research in the field of mobile services and mobile advertising, although they did not explicitly include location aspect in their research.

Contrary to electronic service adoption literature (Chellappa & Sin, 2005; Dinev & Hart, 2006; Malhotra *et al.*, 2004), no significant relationship was discovered between privacy issues and attitude toward using location-based services. Although respondents mean score was relatively high 5.29 (see table 3), relationship to attitude toward the service was not discovered. Meaning that they felt fear of privacy issues and just by assuming from the high fear of privacy issues one could suggest negative relationship toward adoption. Privacy issues, viewed as the fear of disclosing personal information to service providers, others monitoring ones location, and unauthorized sharing of information, did not affect the adoption of location-based services. This is quite a contradictory finding, because in the mainstream media when location-based services such Foursquare and Facebook places have been discussed, it always seems to focus on the privacy concerns. A possible explanation for this finding is that consumers are becoming more and more aware of the practice of data gathering for company use, for example in the dramatic popularity of bonus card and loyalty programs. Furthermore, the sample consisted of highly educated individuals that could perceive gathering data as non-threatening since they understand the importance of it from the company perspective. Xu and Gupta (2009) similarly studied adoption of location-based services through the lens of privacy concerns and personal innovativeness and found no relationship between these constructs and behavioral intention. Due to these findings and the increase of data gathering, more research is proposed in this area to fully comprehend privacy concerns and how valid they actually are in people's decision-making process.

In addition, the results unexpectedly revealed that personal innovativeness did not have an impact on attitude toward using location-based advertising. This contradiction in the relationship between personal innovativeness and attitude might indicate that those who consider themselves more "innovative" are more familiar with the possibilities of location-based services and how it would work in real life and might even have used them in the past or are currently using. Therefore, they might

have negative experiences or for some other reason are not willing to use location-based advertising. Respondents with lower level of personal innovativeness, in turn, might like the idea of location-based advertising, but can not realistically understand how it would be implemented and do not understand the loss of privacy as well as people with a higher level of innovation. These findings warrant further research in the area of personal level of innovation and privacy issues.

Incentives, another nontraditional antecedent used in adoption literature, were found significant in influencing respondents' attitudes. This finding is aligned with previous research on incentives and mobile advertising (Dickinger & Kleijnen, 2008; Rettie *et al.* 2005; Tsang *et al.* 2004; Hanley & Becker, 2008). Following Dickinger &Kleijnen (2008), the perceived usefulness variable was further refined and examined as its own variable of incentives that captures the economic benefits of using location-based advertising. The findings indicate that incentives have a stronger relationship to forming peoples' attitudes than *perceived ease of use* or *social influences.* This validates the importance of including the incentives variable in the model. Economic incentives fulfill different motivations than, for example, the entertainment function that was also found significant. Incentives fulfill a more functional and objective motive that is easily quantifiable while enjoyment is very subjective. The combination of hedonistic and utilitarian motives therefore influence respondents attitude toward using location-based advertising. This study proves that hedonistic motivations have stronger relationship to attitude but studying *incentives*, and its relationship to *enjoyment* in more detail would be an interesting research area in the future.

Consistent with existing literature on adoption theories, *attitude* was discovered to have the strongest direct relationship to behavioral intention to adopt location-based advertising. *Social influence* was another direct determinant of behavioral intention. Although the relationship was not as strong, it still influences respondents decision-making. In the context of location-based advertising, social influences have many facets. Bauer *et al.* (2005) suggests that stronger *attitude*-to-*behavioral intention* than *social influence*-to-*behavioral intention* relationship is plausible because mobile phones can be categorized as a highly personal medium. Since mobile phones and their usage have developed since then, it is seen that this explanation is outdated and inaccurate, even though mobile phones are still considered very much a personal medium. Following Bauers (2005) explanation, social norms should have much stronger relationship to behavioral intention since mobile phones are often used to communicate ones social status and personality. Therefore, it is assumed that the gap between attitude and social influence can be explained by the sample group being less concerned with their usage of location-based advertising will influence how their peers view them.

Overall, this research has several theoretical contributions. By conducting a two-step approach to analyze the measures and the structural model, the validity and reliability of both were demonstrated.

Furthermore, the majority of hypotheses were supported. Therefore, the modified model was accepted. The new model is a continuum of the research in the field of location-based research that adds depth to the field and can be used to predict and analyze adoption of new mobile services that utilize location data. The important factors that influence adoption were demonstrated in this specific context. This gives insight on *how* respondents make decisions to adopt location-based advertising. Furthermore, this study examined advertising through the lens of adoption research, which also brings additional insight to field of advertising.

6.2. Managerial implications

This research has several implications in practice. These findings give direction to developers and marketing managers on how to design mobile services that fit consumer needs and preferences, and therefore, increase the probability of market success. It also provides a basic level of knowledge to marketers on how location-based advertising can be incorporated in a firms' marketing strategy. Furthermore, it was shown that the market is ready for this sort of innovation and that the awareness and adoption is low even in the young age group that often represents the early adopters of such services, thus a market potential exists. The results indicate that marketing managers and developers should pay close attention to *perceived enjoyment*, *incentives*, *social influence* and *perceived usefulness*. Special emphasis should be on the aspects of enjoyment – as entertainment, fun, and exiting - when new services are being developed. The results show that enjoyment has a very strong relationship to increasing attitudes that in turn increases consumers' intention to adopt location-based advertising. Attitude was found the most significant determinant for intention to adopt location-based advertising. Marketers should design applications that fulfill consumers' internal motivation to be entertained. This could be done by adding gamification aspects to applications that are not generally considered fun to use. References could be taken from video games, bonus/loyalty systems, and social media where individuals are engaged in building their identity, value or competing with others. This adds a spectrum to the services that engages consumers to spend more time on the service or application in order to build their presence. This in turn allows marketers to collect valuable data from their customers and improve their offerings. Translating old marketing into the mobile medium is not enough, as respondents prefer applications that interact with the user and the environment.

Marketers should also consider the social context of their service. Social influence – what others think one should do and how will it make them look – were found to influence the intention to adopt location-based services. Since mobile phones represent fashion statements for some (Katz & Sugiyama, 2005), in a similar manner applications can have more meaning than just as a mere communication tool. For some, being first to use an innovation might be important to keep a more

innovator status of oneself. Although not researched here, many location-based services are social in nature. Others can follow individual users on a map and see their consumption of goods, restaurants, events, etc. In this case location-based advertising is a tool to communicate ones identity by what one consumes and the places one visits. Whether a social instrument is used in an application must have close consideration and this research doesn't contribute to that discussion. What can be concluded from here is that social context does influence the adoption of location-based advertising.

Results also emphasize that marketers should consider the *perceived ease of use* of their services, as the relationship with attitude was witnessed. This is hardly groundbreaking but indicates that there should be close attention paid to the usability of the service. The easier the service is for consumers to use, the more positive attitudes they will hold.

6.3. Limitations and future research

As the results of this research are interpreted, limitations must be taken into account. Since a convenience and snowball sampling method was used, validity issues must be considered. Respondents for this study were gathered from the pool of the researchers social network on Facebook, and therefore the findings cannot be concluded to reflect the general population. In addition, as the sample was represented by one majority nationality, age group, and education level, the ability to generalize to other nations and age groups is limited. However, the purpose of this research was not to represent the general population and their decision-making process to adopt location-based advertising, but to test a new conceptual modified model and new constructs in order to gain insight on the factors that influence adoption of this particular mobile service.

The extent to which behavior intention leads to actual behavior – adoption – can also be questioned. Although this relationship has been shown (Ajzen & Fishbein, 1980), a longitudinal study with individuals' pre and post adoption behaviors and perceptions would yield more accurate findings and richer understanding of the factors and demographic variables that influence behavior in different levels of the decision-making process to adopt mobile services. This method should be used in future location-based service research since at the time of this study, the adoption of location-based advertising was in the beginning stages, restricting the methods to study the subject.

Although the internal validity of the model was demonstrated, some of the model fit indicators were below the suggested levels. In this study, the constructs for the model were derived from existing literature review. Methods in TRA by Ajzen and Fishbein (1980), where beliefs of respondents are first identified by qualitative research methods that are later validated with factor analysis to represent the constructs in the model, should be used to validate model suggested in this study.

This study yielded richer understanding of the critical factors that influence the adoption of a particular type of location-based service – location-based advertising that is downloaded to users mobile phone, thus allowing ads where the user has the ability turn the application off as they wish. As many types of location-based services are being developed and already exist in the market, studies on them are also warranted to gain better understanding of location-based services as a whole from the customer perspective. Furthermore, the findings of this study yield contradictory results regarding the relationship between personal innovativeness and privacy concerns. The review of related scientific articles and popular media for this research discovered that these are relevant factors, but no evidence was found in the analysis. Therefore, future research revolving around these two constructs and adoption is proposed. Furthermore, as enjoyment was found significant determinant, it also suggested that research around this particular construct is done in order to fully understand what constitutes the enjoyment factor.

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Appendix 1. Survey scenario description

Survey

Please read the description below about location-based advertising on mobile phones and answer the following questions based on the way you feel about the described situation and/or your personal experiences.

Location-based advertising refers to sending advertising to your mobile phone based on your geographical location, time of day and your personally identified interests. First, you must download the application to your mobile phone and create a personal profile (similar as in Facebook) by identifying your age, interests, brands you like and so forth. The advertising you will receive will be based on this personal profile (and your location and time) and you will not receive advertising that is completely irrelevant to you. To receive advertisement, you must open the application on your phone. No ads will be sent prior to this. The more time the application is on, thus allowing ads on your phone, the more points will you gain. These points can be used in participating companies for reduced price on products and services. When you receive an advertisement you can either do nothing or click the ad to see more information. You can even purchase a product with your mobile phone or for example reserve a table in a restaurant. Now consider the following hypothetical scenario:

You have identified in you personal profile that you like books by a certain author. You enter a shopping mall and turn on the location-based advertising application on your mobile phone, as you have often done to build up your points. While you walk inside the shopping mall, you receive an ad from a bookstore that informs you that a new book from your favorite author has been released and it can be bought from a bookstore in short distance from you. You go and buy your favorite authors new book and receive a 10% discount due to the points you have earned before. Later you leave the shopping mall and turn off the applications and you don't receive any ads until you open it again.