

# A FRAMEWORK OF SMARTPHONE USE FOR TRAVEL

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By  
Dan Wang  
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Examining Committee Members:

Dr. Daniel R. Fesenmaier, Advisory Chair, STHM, Temple University

Dr. Daniel C. Funk, STHM, Temple University

Dr. Steven L. Johnson, Fox School of Business, Temple University

Dr. Iis P. Tussyadiah, Institute of History and Civilization,  
University of Southern Denmark

Dr. Zheng (Phil) Xiang, External Member, College of Merchandising, Hospitality &  
Tourism, University of North Texas

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## ABSTRACT

Smartphones appear to perfectly match travelers' needs due to their portability and easy access to the Internet. The current literature in management information systems (MIS), communication, marketing, and tourism provides a basic foundation with which to understand the adoption and use of information communication technology (ICT) such as smartphones. However, a critical review of this literature indicates that there is a need to develop a much richer theoretical framework that describes the use of smartphones for travel. In particular, our understanding of the use of smartphones for travel is largely established from a quantitative perspective method, and as such, it is argued that this perspective cannot provide an in-depth understanding of the mechanisms that affect the use of smartphones in travel which, in turn, shapes the travel experience. That is, it appears that there is a lack of integration of the various models describing the nature of the use of ICT in travel. Additionally, it is argued that the processes shaping the use of technology which were developed in the organizational settings have been inappropriately applied at the individual level, and therefore should be critically examined within the travel context.

The overall goal of this dissertation is to develop a theoretical framework describing the mechanisms shaping the use of smartphones for travel, and can be addressed by answering the following questions: *(1) What are the uses of smartphones in the context of travel? (2) What are the factors influencing the use of smartphones in the context of travel? And, (3) What are the mechanisms shaping the use of smartphones for travel (i.e. How are the factors working to shape the use of smartphones in travel context?).* A phenomenological approach was used to answer these questions as

quantitative methods are believed to be inadequate in describing the processes underlying the use of smartphones for travel. Twenty-four Americans who own one kind of smartphones and traveled at least once for leisure purpose in the most recent three months were interviewed extensively to gain an in-depth understanding of their uses of smartphones and resulting travel experience. Qualitative content analysis was used to analyze the interview transcripts, and data triangulation based upon a series of follow-up interviews and member check was used to ensure the trustworthiness of the interpretation.

This study identified four categories of uses of smartphones for travel (including 25 unique activities) including the uses of smartphones for communication, entertainment, facilitation, and information search. Five sets of factors that are associated with the use of smartphones for travel were identified from both contexts of travel and everyday experience. Three sets of factors that directly lead travelers to use smartphones for travel are travelers' motivations to use smartphones as a tool to achieve some purposes, their cognitive beliefs toward the use of smartphones, and other situational facilitators (e.g. no computer access) that lead the informants to use smartphones rather than any other alternative ways. Besides the three sets of direct factors, the informants indicated that their use of smartphones changed their travel experience. More important, the everyday use of smartphones and the changes brought to people's lives appear to be indirect factors influencing the use of smartphones for travel.

These results describing smartphone's uses, outcomes and the mechanisms shaping this behavior were used as the primary basis in proposing a theoretical framework describing the use of smartphones for travel including its antecedents, process, and outcomes. The theoretical framework suggests four propositions. First, the

underlying processes shaping the use of smartphones for travel is a process of appropriation in which a person “makes it his/her own” whereby the smartphone user learns, adjusts, and internalizes the ‘essence’ of the smartphone based on their uses in everyday context as well as previous travel experiences (Proposition 1). Second, the use of smartphones in everyday context lead to the changes of communication, information consumption, and the uses of other digital devices, and these changes influenced the use of smartphones for travel through transformation effect and spillover effect (Proposition 2). Third, the changes in everyday experience influence the use of smartphones for travel by influencing traveler’s motivations in the context of travel (Proposition 3). Finally, this study indicates that the appropriation process leads to changes in the travel experience. In particular, people change their travel activities including pre-trip planning, en-route arrangements, after-trips activities as well as their interpretations toward trips and sensations (Proposition 4).

This study clearly delineates the relationships between use of smartphones and the impact of this use on travel behavior, and suggests several new perspectives with which to study the impact of technology on travel. First, this study indicates that a systems view should be adopted in tourism studies. Travelers are not isolated from their daily lifestyles, personalities, social connections, and other individual background (e.g. knowledge, preferences, etc.). As such, the behavior of travelers cannot be understood without consideration of the influence of other settings. Therefore in tourism studies, a systems perspective is important so as to reflect the intimate relationships (and influences) of the various ‘subsystems. Second, this study suggests a dynamic view for studies of technology and travel. The results of this study indicate that the uses of smartphones in

travel are shaped by the interactions of a variety of factors. Therefore, in the studies of technology and travel it is important to understand the dynamic processes which shape the use of technology for travel. Third, this study suggests a development view for the study of technology and travel. This perspective includes not only the recognition that adoption of new technology may influence travelers and travel experience, but also the evolving use of the new ICT tools (e.g. smartphones) along with the development of these tools may substantially change travelers' behavior and travel experience.

Additionally, this study suggests a new perspective is needed regarding the concept of travel experience in that the use of smartphones reconfigures the current relationships between travelers, space, and time and as such, implies that the conceptualization of travel experience should go beyond the argument of the dichotomy of everyday life and travel and evolve with the development of information technology. This study also offers several managerial implications in the areas of mobile marketing, destination marketing and management, and the design of travel information services on the smartphones platform.

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*For Father and Mother*

*For Xiang (David) Li*

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## **CHAPTER 1. INTRODUCTION**

In recent years mobile phones have evolved into “smartphones” that are fully functional computers with a variety of input-output capabilities and provide reliable and ubiquitous Internet access (Want, 2009). The superior performance of smartphones has encouraged an exponential increase in subscribers for smartphone service. For example, according to comScore (2012), a digital business analysis company, 36.1 percent of Americans age 13 and older have adopted a smartphone by the end of 2011, representing an adoption rate for smartphones for over 50 percent higher than 2010.

The portability and easy Internet access features of the smartphones perfectly match travelers’ needs for mobility and ubiquitous information support (Mill & Morrison, 1992). In their discussion of the use of information communication technology (ICT) within the stages of the travel process (i.e., pre-consumption, consumption, and post-consumption), Gretzel, Fesenmaier, and O’Leary (2006) identified the various information and communication needs of travelers. They concluded that travelers usually need constant information support during trips due to the uncertainty of the environment, inadequate capability to make judgments due to lack of experience, and unexpected changes in plans. As such, smartphones with superior computation capability, portability, and Internet access appear to be particularly able to “facilitate” travelers in many ways (Buhalis & Law, 2008).

Considering the substantial influence of smartphones in the context of travel, studies have been conducted to understand the use of smartphones in two main areas: 1) the design of smartphones information services, and 2) the impact of these information

services on the travel experience. The first stream of research focuses on the design of smartphones applications for facilitating travelers during trip and satisfying travelers' information needs. This work includes the design of mobile tour guides systems (e.g. Bellotti et al., 2008; Grun et al., 2008; Rasinger, Fuchs, Beer, & Hopken, 2009), navigation systems (e.g. Burigat & Chittaro, 2005; Haid, Kiechle, Goll & Soutschek, 2008), and information systems supporting the interactions between the smartphone and the traveler (e.g. Gellersen, Schmidt, & Beigl, 2002). This stream of study focuses primarily on applications of mobile technology for travel and is "technique" oriented.

The second stream of research, on the other hand, focuses on the impact of smartphones on the travel experience. The results of these studies indicate that the use of smartphones and their applications affect the travel experience by changing travelers' activities and emotions (Brown & Chalmers, 2003; Kramer, Modsching, ten Hagen, & Gretzel, 2007; O'Brien & Burmeister, 2003; Rasinger, Fuchs, & Hopken, 2007; Wang, Park, & Fesenmaier, 2011). These studies primarily consider the impact of smartphones on travel from a sociological perspective. For example, Kramer et al. (2007) explored travel-activity changes during trips due to new information found from smartphones' access to resources. Kramer et al. concluded that the use of smartphones can lead travelers to be more flexible during trips. In addition, Wang et al. (2011) explored the mediation effects of smartphones in the context of travel and found that smartphones change tourists' behavior and emotional states by addressing a wide variety of information needs.

Interestingly, it seems that both perspectives focus mainly on the design of information services and the "outcomes" of use for travel, while the antecedents of the

processes (i.e. why travelers use smartphones for travel) have not been considered. Indeed, the understanding of the antecedents of smartphones use is critical for the understanding of both processes and outcomes. That is, in order to design information services for travelers, it argued that it is essential to understand the contextual factors, user-related factors and the actual use of such services (Gretzel, 2011). However, recent studies deemphasize the importance of contextual factors related to travel and other factors related to users such as knowledge of information technology and familiarity with the smartphones. Also, some studies sought to identify the outcomes of smartphones use (i.e. the impact of smartphones on travel experience) without considering the factors driving the use of smartphones for travel; as such, these studies are unable to determine how these outcomes (e.g. traveler's behavioral changes) influence future travel experiences.

In addition, the current understandings of the use of smartphones for travel are mainly established from quantitative methods, which developed an incomprehensive understanding of the use of smartphones for travel in that these studies were based on the functions and features integrated in smartphones rather than actual use of smartphones. Indeed, following Moustakas (1994), it is argued in this dissertation that the quantitative approach separates the subject (i.e. travelers) and object (i.e. the use of smartphones) by eliminating the meanings that the subjects assign to the object. As such, the various meanings of the uses of smartphones by different travelers cannot be investigated. In order to understand the essence of the use of smartphones for travel, and further, to understand the antecedents and outcomes of such use, this phenomenon needs a qualitative perspective.

The overall goal of this study is to develop a theoretical framework describing the mechanisms shaping the use of smartphones for travel which integrates relevant theories and literatures from the fields including MIS, communications, marketing and tourism. In order to achieve this goal, the following questions must be addressed.

*(1) What are the use of smartphones in the context of travel?*

*(2) What are the factors influencing the use of smartphones in the context of travel?*

*(3) What are the mechanisms shaping the use of smartphones in the context of travel (i.e. How are the factors working to shape the use of smartphones in the context of travel?)*

It is important to clarify the boundaries of key terms that constitute the focal point of research (Beaton & Funk, 2008). The focal point of this study is the use of smartphones for travel. As such, three key terms are identified in this study: smartphones, travel, and travel experience.

### *Smartphones*

A smartphone should be defined as a concept proposed to highlight the differences between the advanced mobile phones and traditional feature phones, which are basic mobile phones with only the functions of making phone calls and text messages (Charlesworth, 2009).

In this study, the smartphones is defined as the mobile phone with the following features:

(1) running on one of the following mobile operating systems (OS) including Google's Android, Apple's iOS, or RIM's BlackBerry OS. Although other mobile operating systems such as Nokia's Symbian, Samsung's Bada, Microsoft's Windows Phone, HP's

webOS exist in the market, the smartphones with aforementioned three systems took around 93% market shares in the United States at the end of 2011 (comScore, 2012); (2) having application programming interfaces (APIs) for running third-party applications. Considering the diversified information services that provided by the smartphones applications (Wang & Xiang, 2011), this study focus on the use of smartphones that allows to download and install third-party applications.

### *Travel*

In tourism and hospitality field, both industry and academic sections accept the definitions of basic terms such as tourist, travel, tourism industry that are provided by the World Tourism Organization (UNWTO). According to UNWTO, the definition of travel is related with the definition of tourist. A tourist refers to

*“A visitor (domestic, inbound or outbound) is classified as a tourist (or overnight visitor), if his/her trip includes an overnight stay.” And*

*“Travel refers to the activity of travelers. A traveler is someone who moves between different geographic locations, for any purpose and any duration. The visitor is a particular type of traveler and consequently tourism is a subset of travel.”*

In the tourism and hospitality literature, the terms travel and tourism are interchangeably used to refer to the activities in which travelers are involved.

In the literature scholars in tourism and hospitality field further clarify the term “travel” as a context whereby they focus on the dimensions of “travel” that are different from “people’s daily lives”. Early literature (in 1970s and 1980s) discussing the nature of travel focuses on objective authenticity and the “tourist.” For example, MacCannell (1973) argued that tourists seek authenticity and that they show particular fascination in the real lives of others. Urry (1990) proposed the concept of “tourist gaze”, arguing that

travel/tourism results from a basic binary division between the ordinary (i.e., everyday) and the extraordinary (i.e. travel context). More recently, Uriely (2005) and others conceptualized travel from a point of view that the distinctiveness of everyday life and travel experience is somehow blurred by the technological progress, mass media (Lash & Urry, 1994) and the changes of life style (Ryan, 2002) and work style (i.e., business travelers) (Uriely & Reichel, 2000). Further, Larsen, Urry, and Axhausen (2006) proposed the concept of “de-exoticising tourism” whereby the boundaries between dualisms such as leisure and work, away and home, authenticity and inauthenticity, the extraordinary and the ordinary, and guest and host are blurred. The recent discussion of travel experience leads scholars to investigate the “spillover” effects of daily life into the travel experience, and have argued that people carry routines (e.g., read news, participate in social networks) and habits from their daily lives into travel (Currie, 1997; Ryan, 2003; Vogt & McKay, 2012; White & White, 2007).

In summary based on both official definition from UNWTO and other relevant literature, this study considers travel as the context in which travelers perform both the activities related with their trips, including travel planning, visit activities, and after-trip follow-up activities, and the activities not related with their trips but happened during their trips (e.g. read news). Traveler, in this sense, refers to visitors “taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited” (UNWTO, 2008).

### *Travel Experience*

Travel is a process in which people move to some other places other than the one

they are usually living, interact with people and objects in those places, and document the process and perceptions (Tussyadiah & Fesenmaier, 2009). Based on such understanding of travel as a “linear” process, some scholars have defined the travel experience from a temporal perspective (Jennings, 2005) which involves three phases: 1) the anticipatory phase; 2) the experiential phase; and 3) the reflective phase. In this process, travelers involve in a wide variety of activities including planning, reservations, traveling, documenting etc. (Craig-Smith & French, 1994). Therefore, from the temporal perspective, the travel is an “activity-based” process.

Considering that experiences are reflective and inherently personal (Holbrook & Hirschman, 1982), some scholars argue that the travel experience lies “beyond” the temporal dimension. Volo (2009) defined travel experience as everything between perception and sensation and is a kind of inner psychological status. Urry (1990) introduced the concept of tourist gaze in arguing that the travel experience is different for each individual because the traveler subjectively objectifies and interprets the places he/she visits. Uriely (2005) echoed this viewpoint by suggesting that the diverse characteristics of the travel experience can be explained by the diversity of travelers’ motivations. Therefore, travel is a sense-making process, in which travelers construct the travel experience by learning, understanding, and feeling the places visited and the culture embedded in these places (Jennings & Weiler, 2006).

Based on the above understanding of the “activity” and “interpretation and sensation” dimensions of travel experience, some scholars defines the third dimension of travel experience on space and time. Travel is about geographical movement (Li, 2001). With the understanding of travel experience and geographic conscious of places,

Tussyadiah and Zach (2011) defined travel experience as a performative action that is contextualized in the specific geographic environment, in the forms of sensation and perception, while social/ affective results are the outcomes of such action. Jansson (2007) also emphasized the differences of travel experience with people's daily experience in terms of the context constructing by geographic environment and time. According to the various opinions on the conceptualization of travel experience, in this study, travel experience refers to an integration of the planning activities for the activities in the specific geographic environment, the performative action that is contextualized in the specific geographic environment, and the interpretations and sensations toward the activities and people in the specific geographic environment as well as the environment itself.

This study contributes to the field of ICT and tourism from three aspects. First based on empirical exploration, this study integrates the extant literature of ICT and travel and the theories regarding the adoption and use of technology to develop a theoretical framework articulating the mechanisms shaping the use of smartphones for travel. Considering the uniqueness of the travel context in comparison to the general business environment and the limitations of current theories for adoption and use of technology (e.g. the ignorance of contextual factors), inter-disciplinary inquiries into tourism and technology call for a more inclusive view to investigate the adoption and use of technology in the context of travel (Gretzel, 2011). Otherwise, the predictions for use of smartphones for travel, as well as the impact of such use, cannot be accurate. This study explores the factors influencing the use of smartphones for travel from the descriptions of travelers' experiences. And then, the study adopts an inter-disciplinary

perspective to analyze the results by identifying the relevant concepts from extant literature in different disciplines, such as tourism, sociology, and technology. As a result, the study develops a framework based on the integration of multiple disciplines to seek for a comprehensive understanding of the phenomenon.

Second, this study contributes to the argument involving the dichotomy of travel and everyday experience in order to further understand and conceptualize travel experience. In the discussions regarding travel experience, the opinions toward the dichotomy of travel and everyday experience is diversified and changes with the evolution of the travel and tourism industry (Uriely, 2005). The recent studies (e.g. Larsen, Urry, & Axhausen, 2006; Ryan, 2002; Uriely & Reichel, 2000) highlighted the association of everyday experience and travel and argued that travel is not an isolated context and travelers carry part of their everyday experience (e.g. habits, hobbies, personality) to travel. As such, everyday experience influences the travel experience. Considering the substantial impact of technology on people's everyday experience, researchers (e.g. Vogt & McKay, 2012) studied the spillover effect of technology for travel and the impact of such effect on the travel experience. This study explores the use of smartphones for travel on the basis of the use of smartphones in everyday experience. Then, the associations of the use of smartphones in both contexts are explored. Therefore, it is hoped that this study extends the understanding of the travel experience, particularly with regard to the dichotomy of everyday experience and travel, from the perspective of the use of technology.

Finally, this study contributes to business practices by providing managerial implications for marketing and information service design. This study echoes the view

that travel is a part of people's life-experiences (Edensor, 2006; Hannam & Knox, 2010), and seeks to identify the activities to which of smartphones apply in people's daily lives, leading to the use of smartphones in the travel context and the underlying appropriation process. This study revealed the factors influencing the use of smartphones and provided a better understanding of the integration of smartphones in people's everyday experience. As such, hospitality and tourism businesses can use the resulting framework to guide development of online mobile applications influencing both people's every experience and travel experience.

This dissertation is organized into the following chapters. Chapter 2 (i.e., Literature Review) discusses the theoretical foundations of this study based upon four streams of research: 1) the use of smartphones for travel; 2) information communication technology (ICT) and travel; 3) the factors influencing the adoption and use of technology; and, 4) the mechanisms shaping the individual adoption and use of technology in organizations. The literature review chapter also includes a critique of the relevant literature, which provides the foundation for the problem statement and research objectives. In Chapter 3, the research methods employed are described. In the research method chapter, the rationale for qualitative research using phenomenology is introduced and then used as a guide to explain the design of this study; additionally, data collection and data analysis are described in detail. Chapters 4 and 5 report the results of this study and are organized based on the three research questions. In particular, Chapter 5 integrates the findings so as to describe the mechanisms shaping the use of smartphones for travel. Chapter 6 integrates the extant literature with the findings of this study in order to propose a comprehensive theoretical framework describing the use of smartphones for

travel. Finally, Chapter 7 discusses the theoretical and managerial implications and possible limitations of the dissertation, and recommends a series of studies that should be considered for future research.

## **CHAPTER 2. LITERATURE REVIEW**

The focus of this research is examining the antecedents of the use of smartphones for travel and mechanisms shaping the use of smartphones for travel. In this chapter, the study will be framed in the context of relevant literature. The theoretical foundation of this study is introduced in four sections, including the literature reviews on 1) the use of smartphones for travel, 2) information communication technology (ICT) and travel, 3) the factors influencing the adoption and use of technology, and 4) the mechanisms shaping the individual adoption and use of technology in organizations.

Specifically, first, the studies regarding the use of smartphones in the context of travel are reviewed. This literature presents an extant understanding on the types of smartphones information services that are available for travel and that are used for travel. Second, the extant literatures on the use of information communication technology (ICT) for travel are reviewed. This literature review provides an understanding of traveler's information needs and the roles of ICT tool (e.g. smartphones) in satisfying these needs. Such understanding indicates the fundamental factors that influence the use of smartphones for travel. Third, the nature of this study is about the adoption and use of smartphones for travel, as such, this study is placed in the field of studies on technology adoption and use. The theories on adoption and use of technology are introduced and integrated to present a reservoir of the determinants of adoption and use of technology. Fourth, the overall goal of this study is to identify how the determinants of the use of smartphones work together to shape such use. Therefore, the literatures regarding the

mechanisms shaping the individual adoption and use of technology are reviewed. This literature suggest some processes in which a variety of factors originating from the organization context work together to determine the use of technology at the individual level.

The following section provides a critical review arguing that the current theories and framework is support, however, inadequate to directly apply to study the use of smartphones in travel context. Therefore, it is calling for the development of a new theoretical framework from the travelers' rich descriptions of their use of smartphones for travel.

## **2.1 Theoretical Background**

With aforementioned definition of “smartphones” and “travel”, the use of smartphones for travel is framed in the relevant literature based on the nature of the phenomenon (i.e. the adoption and use of information communication technology in travel). Four streams of literature are introduced: 1) the use of smartphones for travel, 2) information communication technology (ICT) and travel, 3) the factors influencing the adoption and use of technology, and 4) the mechanisms shaping the individual adoption and use of technology in organizations.

### *2.1.1 The Use of Smartphones in Travel*

In recent years, the development of mobile technology has made many Internet activities (e.g., browsing websites, online shopping) available on the mobile platform. Also, mobile technology has enabled many new information services on mobile platform (e.g., location-based services). Considering that mobility and information intensiveness

are the primary features of a travel process (Mill & Morrison, 1992), both academia and industry expect for the substantial influence of smartphones on travel (Moltz, 2012).

Indeed, studies have provided some insights on the information services available on smartphones platform and how travelers use these services. Wang and Xiang (2012) employed a data mining approach to classify the types of information services and design features of travel-related iPhone apps. They grouped the most popular (based on the number of customer reviews) travel-related smartphones apps in the iTunes app store into eleven categories (Table 1), including single-city destination guide, online travel agency, language assistant, flight manager, theme park & resort guide, facilitators, multiple-city destination guide, food finder, entertainment, live camera, and currency converter. Table 1 provides the definitions of each category and application examples. This study shows that smartphones have comprehensively extended the Internet-enabled services such as information search, reservation and e-commerce, multimedia content consumption and creation as well as social communications to the mobile platform. Also, Wang, Park, and Fesenmaier (2012) reported that traveler mainly used smartphones for four kinds of activities, including travel planning (e.g. prepare itinerary, make reservations), general facilitation (e.g. search for things to do, navigation), advanced facilitation (e.g. guide tours, track movements), and share travel experience (e.g. share photo on Facebook).

The studies also explored the impact on travel experience brought by the use of smartphones. For example, Kramer, Modsching, Hagen, and Gretzel (2007) found that the use of smartphones can create spontaneous deviations such as the changes of travel route, duration, and walking distance. Similarly, Wang, Park, and Fesenmaier (2011) identified that travelers using smartphones are likely to changes their plans because they

can access to the Internet almost anytime and anywhere and acquire information for decision-making. They also found that the use of smartphones can not only change travel activities, but also change travelers' emotions by making them feel more secure, confident, and excited.

**Table 1. Types of Travel-Related iPhone Apps**  
(Adopted from Wang & Xiang, 2012, p.312)

<b>Category</b>	<b>ID</b>	<b>Definition</b>	<b>N</b>	<b>Examples</b>
Single-city destination guide	F	Mobile tour guide for a particular city (i.e. New York, Chicago)	63	NYC Way; DC Going Out Guide; London Tube.
Online travel agency	C	Apps for searching and reserving transportation tickets/hotels/cars	35	Travelocity; Rental Car Sites; Hampton.
Language assistant	A	Apps for translation	34	Language Translator; iTranslate it; Speak Spanish
Flight manager	B	Apps for searching, tracking and booking flights	34	TripCase; Flight Sites; TripTracker.
Theme park & Resort guide	D	Apps for providing travel tips within theme parks or resorts such as Walt Disneyland theme park	31	Disneyland Wait Times; Ride Hopper; Hersheypark
Facilitators	K	Apps for providing quick facts such as Wi-Fi spot, cheap gas stations, local times.	30	Wi-Fi Finder; CheapGas; AccuTip.
Multiple-city destination guide	G	Mobile tour guide for multiple cities	26	Citysearch; GayCities; Goby.
Food finder	E	Apps for searching restaurants	24	Urbanspoon; Happy Hours, LocalEats.
Entertainment	I	Apps for the purpose of fun	14	Postman; Trip Journal; Virtual Tourist.
Live camera	H	Apps for viewing live situations in other places through webcams	5	Live Cams; TraffiCam SG; WorldView.
Currency converter	J	Apps for calculating exchange rates	4	Currency; Quid; CurCon

*Note: Total N=300*

A limited number of studies (i.e. six articles) regarding the antecedents of the use of mobile phones in the context travel were identified. Five studies (out of six) adopted the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw,

1992) or the extension of TAM model (Venkatesh & Davis, 2000) to quantitatively examine the adoption of mobile information services. Three of these studies examined the adoption of general use of mobile information service (Kim, Park, & Morrison, 2008; Eriksson & Strandvik, 2009; and Kim, Ahn, Chung, 2012), and two of them examined the adoption of mobile tour guide system (Peres, Correia, Moital, 2011; Tsai, 2010). The findings of these studies confirmed that the adoption of mobile information services in travel are influenced by the cognitive beliefs identified in the TAM model such as perceived usefulness, perceived ease of use, perceived risk, etc. Only one study (Kaasinen, 2005) employed qualitative method to explore the contextual factors and user related factors that influence the use of location-aware mobile tour guides. Kaasinen's study mainly confirmed the TAM model, but it also identified how the context of travel shaped the user's needs. However, the focus of Kaasinen's study is only limited on the location-aware tour guide.

### *2.1.2 The Role of Information in Travel and the Use of ICT in Travel*

The nature of travel assigns information an important role in travel. On the one hand, travelers have a variety of information needs (Cho & Jang, 2008; Vogt & Fesenmaier, 1998). Travel experience is a process in which tourists leave the place where they live and travel to different places, interact with the objects and people in those places, and document travel memories in the formats of photos and videos (Clawson, 1963). Scholars suggest that travel experience is outlined by a variety of activities (Jennings, 2005) and enriched by travellers' psychological processes and emotional states (Holbrook & Hirschman, 1982). The understanding of travel process and travel

experience suggests that travelers are involved in different activities and have needs to connect with others. Accordingly, scholars identified that travelers have a variety of information needs such as functional needs, innovation needs, hedonic needs, aesthetic needs, and social needs (Vogt & Fesenmaier, 1998; Cho & Jang, 2008, the definitions of each kind of information needs are presented in Table 2). Therefore, information plays an important role in travel.

**Table 2. The Traveler’s Information Needs**  
(Adapted from Vogt & Fesenmaier, 1998, p.580)

<b>Information needs</b>	<b>Definition</b>
I. Functional information needs	Tourists need information to learn, increase the value of the trip, improve efficiency, reduce uncertainty, and release stress.
II. Innovation information needs	Tourists need information to be innovative, look for different things, plan new things for trips.
III. Hedonic information needs	Tourists need information to be excited, “feel” the destination, and experience the local cultural and life.
IV. Aesthetic information needs	Tourists need information to imagine destinations, and form expectations
VI. Social information needs	Tourists need information to give advices to others, share their experience, and be valuable for their friends.

On the other hand, the studies on the nature of tourism products, the consumption of tourism products, and travelers’ decision-making further highlight the importance of information in travel. First, tourism products mostly are intangible personal service products, involving personal interactions between customers and service providers (Lovelock & Wright, 1999). They are delivered away from home, often in unknown places, and are associated with functional, financial, physical, psychological, and social risks (Lovelock & Wright, 1999). As such, information is more critical in decision-making of tourism consumption than the ones for tangible products (Fodness & Murray,

1998; Snepenger & Snepenger, 1993) from an information-processing theory point of view (Bettman, Luce, & Payne, 1998; Engel, Blackwell, & Miniard, 1986).

Second, tourism consumption is not about the consumption of one single service or product, but a system of services and products. Inskip (1991) and Leiper (1990) viewed a tourist attraction as a system consisting of three elements (a human element, a central element, and a marker or informative elements), and a trip usually includes several such kinds of systems. Further, Woodside and Dubelaar (2002) use the notion of “tourism consumption system” (TCS), which is defined as the set of related travel thoughts, decisions, and behaviors by a discretionary traveler prior to, during, and following a trip, to describe the mental and behavioral components in the travel consumption process.

Third, the understanding of the complexity of tourism consumption raises the skepticism on the traditional views of travel decision-making. Traditionally, travel decision-making was thought as a sequential and contingent process, and tourists follow a funnel-like procedure of narrowing down choices among alternative (Moutinho, 1987; Um & Crompton, 1990; Van Raaij & Francken, 1984; Woodside & Lysonski, 1989). However, considering that tourists cannot be completely rational decision makers and tourism involves a wide variety of choices other than only destination, scholars explored the multidimensionality and ongoing sequence in travel decision-making (Decrop, 1999; Decrop & Snelders, 2005; Hyde, 2004; Jeng & Fesenmaier, 2002; Sirakaya & Woodside, 2005; Woodside & MacDonald, 1994). Hence, travel decision-making process is featured by multidimensionality, sequentiality, and contingency (Jeng & Fesenmaier, 2002). Therefore, travelers have constant and critical demand for information in travel.

The important role of information in travel explained the substantial impact of ICT on travel and travelers. The ICT and travel has developed together for two decades since the application of global reservation system (Buhalis & Law, 2008). With the advent of Internet era at the end of 1990s, the ICT has penetrated into almost every aspect of people’s lives (Ratchford, Lee, & Talukdar, 2003) and transformed travel experience (Wang, Fesenmaier, Werthner, & Wober, 2010). Gretzel, Fesenmaier, and O’Leary (2006) discussed the integration of ICT (including Smartphoeness) within the overall travel process (i.e., pre-consumption, consumption, and post-consumption) (Figure 1). In the pre-consumption stage, ICT is used to obtain the information for planning trips, formulating correct expectations, evaluating and selecting alternatives, and communicating with the providers. In the consumption stage, ICT is used mainly for keeping connected, facilitating trips, and helping spontaneous decision-making. In the post-consumption stage, ICT is used for sharing and reliving experience and establishing close relationships with service providers such as in the case of frequent flyer programs. Therefore, travelers now have become to depend on ICT in the whole process of travel.



**Figure 1. Three Stages of Travel Experience and the Transformation by ICT**  
(adapted from Gretzel, Fesenmaier & O’Leary, 2006)

The above literature on traveler’s information needs, the nature of travel decision-making, and the dependency of travelers on ICT suggest that the use of ICT in the

context of travel is context dependent. That is, the use of ICT in travel is determined by the features of trips, the contextual factors en-route, and travelers' background (e.g. social network activist), which are the sources generating a variety of information needs.

However, the knowledge regarding traveler's information needs and the nature of consumption in travel only explained that travelers need ICT tools to help them, and this stream of literature did not explain the imperativeness of the use of smartphones in the context of travel. Indeed, the selection and use of smartphones for travel may be affected by many other psychological and cognitive factors and shaped by complicated underlying processes as suggested by the literature streams regarding the adoption and use of technology. In order to further understand the adoption and use of smartphones for travel, the literature streams regarding the adoption and use of technology are reviewed in the next section.

### *2.1.3 Theories for the Adoption and Use of Technology*

The adoption and use of technology has been studied extensively in several distinct fields such as management information systems (MIS), communication, and marketing. The efforts in these fields result in the identification of a large amount of cognitive, psychological, and environmental factors shaping the adoption and use of technology. This stream of literature is featured by the theories of technology acceptance and adoption (e.g. Davis, 1989; Srinivasan, Lilien, & Rangaswanmy, 2002), user and gratification theory (U&G Theory) (Kartz, 1959, Lin, 1977), and innovation diffusion (e.g. Moore & Benbasat, 1996; Rogers, 1995). These theories and the key findings are introduced subsequently in the following sections.

**Table 3. Theories of Technology Acceptance**

(Adapted from Venkatesh, Morris, Davis, & Davis, 2003, p. 428-432)

Name of Theory	Description
<p><b>Theory of Reasoned Action (TRA)</b> (Core constructs: Attitude toward behavior, Subjective norm)</p>	<p>Drawn from social psychology, TRA is one of the most fundamental and influential theories of human behavior. It has been used to predict a wide range of behaviors. Davis et al. (1989) applied TRA to individual acceptance of technology and found that the variance explained was largely consistent with studies that had employed TRA in the context of other behavior</p>
<p><b>Technology Acceptance Model (TAM)</b> (Core constructs: Perceived usefulness, Perceived ease of use, Subjective norm)</p>	<p>TAM is tailored to IS contexts, and was designed to predict information technology acceptance and usage on the job. Unlike TRA, the final conceptualization of TAM excludes the attitude construct in order to better explain intention parsimoniously. TAM2 extended TAM by including subjective norm as an additional predictor of intention in the case of mandatory settings (Venkatesh &amp; Davis, 2000).</p>
<p><b>Motivational Model (MM)</b> (Core constructs: Extrinsic motivation, Intrinsic motivation)</p>	<p>A significant body of research in psychology has supported general motivation theory as an explanation for behavior. Several studies have examined motivational theory and adapted it for specific contexts. Within the information systems domain, Davis et al. (1992) applied motivational theory to understand new technology adoption and use.</p>
<p><b>Theory of Planned Behavior (TPB)</b> (Core constructs: Attitude toward behavior, Subjective Norm, Perceived behavioral control)</p>	<p>TPB extended by TRA by adding the construct of perceived behavioral control. In TPB, perceived behavioral control is theorized to be an additional determinant of intention and behavior. Ajzen (1991) presented a review of several studies that successfully used TPB to predict intention and behavior in a wide variety of settings.</p>
<p><b>Combined TAM and TPB</b> (Core constructs: Attitude toward behavior, Subjective norm, Perceived behavioral control, Perceived usefulness)</p>	<p>This model combines the predictors of TPB with perceived usefulness from TAM to provide a hybrid model (Taylor &amp; Todd, 1995).</p>
<p><b>Model of PC Utilization (MPCU)</b> (Core constructs: Job-fit, Complexity, Long-term consequences, Affect towards use, Social factors, Facilitating conditions).</p>	<p>Derived largely from Triandis' (1977) theory of human behavior, this model presents a competing perspective to that proposed by TRA and TPB. Thompson et al. (1991) adapted and refined Triandis' model for IS contexts and used the model to predict PC utilization. However, the nature of the model makes it particularly suited to predict individual acceptance and use of a range of information technologies.</p>
<p><b>Innovation Diffusion Theory (IDT)</b> (Core constructs: Relative advantage, Ease of use, Image, Visibility, Compatibility, Results demonstrability, and Voluntariness of use)</p>	<p>Grounded in sociology, IDT (Rogers, 1995) has been used since the 1960s to study a variety of innovations. Within information systems, Moore and Benbasat (1991) adapted the characteristics of innovations presented in Rogers and refined a set of constructs that could be used to study individual technology acceptance. Moore and Benbasat (1996) found support for the predictive validity of validity of these innovation characteristics.</p>
<p><b>Social Cognitive theory (SCT)</b> (Core constructs: Outcome expectations-Performance, Outcome expectations-Personal, Self-efficacy, Affect, Anxiety)</p>	<p>Compeau and Higgins (1995) applied and extended SCT to the context of computer utilization. The nature of the model and the underlying theory allow it be extended to acceptance and use of information technology in general.</p>

### *Theoretical Models of the Adoption and Use of Technology*

Eight key competing theoretical models were identified in the MIS literature with twenty core constructs specified (Venkatesh, Morris, Davis, & Davis, 2003). Table 3 presented the eight theoretical models with a brief introduction for each model and its core constructs. These models identified the factors influencing the individual acceptance of technology from six dimensions and each dimension includes a list of specific constructs (Table 4). Specifically, the first dimension is performance expectancy, defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447). This dimension summarized five core constructs including perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome-expectations. The second dimension is effort expectancy, which is “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450), including three constructs (i.e. perceived ease of use, complexity, and ease of use). The third dimension is social influence, “the degree to which an individual perceived that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451), and this dimension includes the constructs of subjective norm, social factors, and image. The fourth dimension is facilitating conditions which are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system” (Venkatesh et al., 2003, p. 453). The facilitating conditions include three constructs (i.e. perceived behavioral control, facilitators, and compatibility). The fifth dimension is the cognitive beliefs towards technology including two constructs (i.e. self-efficacy and anxiety). The sixth dimension is attitude toward using technology, defined as “an individual’s overall

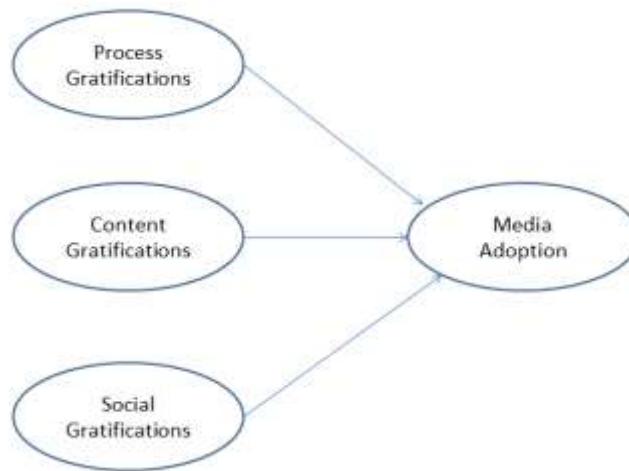
affective reaction to using a system” (Venkatesh et al., 2003, p. 455). The attitude dimension includes four constructs: attitude toward behavior, intrinsic motivation, affect toward use, and general affect. All these constructs are identified to influence the individual behavioral intention to use technology or innovations with different levels of power.

#### *User and Gratification Theory and the Use of Technology*

As an alternative perspective of the TAM model, in the communication literature, User and Gratification Theory (U&G Theory) has been widely used to understand people’s motivations to adopt and use the Internet (Stafford & Stafford, 1996). The U&G theory was developed based on the understanding that individuals have particular motives for media use (Katz, 1959) and the media choices at the individual level are motivated by self-defined uses and goals (Lin, 1977). Internet emerges as one kind of information communication technology as well as a new media due to its strong media content delivery capability (Grover & Pradipkumar, 1999). As such, media use perspective of the Internet becomes very important (Eighmey & McCord, 1998). Also, a basic tenet of the U&G theory is the active audience who is selective and makes their own choices (Levy & Windahl, 1984). The users of Internet and other forms of new media are active audience. Therefore, the researchers adopted the U&G theory to explore the factors (i.e. motivations) affecting the use of Internet at the user-level.

The motivations to use Internet which identified from the studies in this research stream converge to three types of gratifications: content gratifications, process gratifications, and social gratifications (Figure 2). Content gratifications refer that people

use Internet for the contents acquired from it, and process gratifications refer that people use Internet for the enjoyment of the act of using it (Culter & Danowski, 1980). Social gratifications refer that people use Internet for the communication with others (e.g. online chatting, online community) (Stafford, Stafford, & Schkade, 2004).



**Figure 2 Determinants of the Uses and Gratifications of the Internet**  
(Adapted from Stafford, Stafford, & Schkade, 2004, p. 273)

Smartphones have been one of the main mobile media in assisting people for communication, Internet activities and many other tasks such as listening music, navigation. The users of smartphones are active audiences who are selective and make their own choices on the functions of smartphones they use. As such, in the consideration of the use of smartphones for travel, U&G theory provides some insights on people's motivations.

**Table 4. Factors Influencing the Acceptance of Technology from Six Dimensions**  
(Adapted from Venkatesh, Morris, Davis, & Davis, 2003, p. 428-432)

Dimensions	Factors	Definitions
Performance Expectancy	Perceived usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis 1989, p. 320)
	Extrinsic motivation	The instrument perceptions towards performing activity to achieve valued outcomes that are distinct from the activity itself such as improved job performance. (Davis et al. 1992, p. 1112)
	Job-fit	The extent to which an individual believes that using a technology can enhance the performance of his or her job (Thompson et al., 1991, p. 129)
	Relative advantage	The degree to which an innovation is perceived as being better than its precursor (Moore & Benbasat, 1991, p. 195)
	Outcome expectations	The performance-related consequences of the behavior (Compeau & Higgins, 1995).
Effort Expectancy	Perceived ease of use	The degree to which a person believes that using a particular system would be free of effort (Davis 1989, p. 320).
	Complexity	The degree to which an innovation is perceived as relatively difficult to understand and use (Thompson et al., 1991, p. 128)
	Ease of use	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989, p. 320).
Social Influence	Subjective norm	The person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975, p.302).
	Social factors	The individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations (Thompson et al., 1991, p. 126).
	Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system (Moore & Benbasat, 1991, p. 195)
Facilitating conditions	Perceived behavioral control	The perceived ease or difficulty of performing the behavior (Ajzen, 1991, p. 188)
	Facilitators	Objective factors in the environment that observers agree make an act easy to accomplish (Thompson, 1991)
	Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters (Moore & Benbasat, 1991, p. 195)
Cognitions towards technology	Self-efficacy	Judgment of one's ability to use a technology to accomplish a particular job or task.
	Anxiety	Evoking anxious or emotional reactions when it comes to performing a behavior.
Attitudes	Attitude toward behavior	An individual's positive or negative feelings (evaluative affect) about performing the target behavior (Fishbein & Ajzen, 1975, p.216)
	Intrinsic motivation	The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se. (Davis et al. 1992, p. 1112)
	Affect toward use	Feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act (Thompson et al., 1991, p. 127)
	General affect	An individual's liking for a particular behavior.

### *Innovation Diffusion Theory and the Adoption of Technology in Organizations*

In the marketing literature, studies are mainly based on the innovation diffusion theory, which explains how, why, and at what rate the innovations spread through the society and the factors influencing the heterogeneity of innovation adoption in terms of adoption timing among people (Rogers, 1995). Scholars in the marketing field were interested in the investigation and modeling of factors in the economic and marketing environment (e.g. the leadership position of a company in the market) that influence the organization's behavior to adopt an innovation as well as the outcomes of innovation adoption at different rate (Danaher, Hardie, & Putsis, 2001). The findings in this literature stream are fragmented and are lack of systematic conclusions on the determinants of organization's behavior in innovation adoption (Stafford, Stafford, & Schkade, 2004). Table 5 listed the seminal studies since 1980s and main findings of each of the study. In summary, the determinants identified in this literature stream are from business environment (e.g. competition environment, investment environment), organization environment (e.g. organization characteristics), leaders or management team (e.g. manager's expectation, leader's understanding of technology and market), macro-environment (e.g. country wealth, social heterogeneity), and marketing strategies (e.g. the elements of marketing-mix).

In summary, the examination of theories regarding adoption and use of technology (i.e. technology acceptance theories, user and gratification theory and innovation diffusion) resulted in a reservoir of individual and environmental factors that influence the adoption and use of technology. These factors can potentially influence the use of smartphones which is one of ICT tools. However, the contextual factors in travel

can influence which of these factors and how these factors influence the use of smartphones in travel. Therefore, these factors can serve as a foundation to understand the use of smartphones for travel considering that smartphones are one kind of ICT tools.

**Table 5 Important Studies on the Adoption and Diffusion of Technology among Organizations in the Field of Marketing**

<b>Seminal Studies</b>	<b>Description</b>
Gatignon & Robertson (1985, 1989); Robertson & Gatignon (1986)	The effects of competition on the adoption of technological innovations by organizations are modeled and empirically tested. The results suggest that firms most receptive to innovation are in concentrated industries with limited price intensity and that supplier incentives and vertical links to buyers are important in achieving adoption. The results also suggest that adopters can be separated from non-adopters by their information-processing characteristics.
Sultan, Farley, & Lehmann (1990)	The meta-analysis of 213 applications of diffusion models from 15 articles relates model parameters to the nature of the innovation, the country under study, model specification, and estimation procedure. The results suggested that types of innovation, country, and marketing strategies are the factors influencing diffusion that are obtained consensus in the field.
Sarvary, Parker, & Dekimpe (2000)	The coupled-hazard approach was applied to study the global diffusion of technological innovations. The method explicitly recognizes the conceptual difference between the timing of a country's introduction of the new technology and the timing of the innovation's full adoption in the country. The results suggested that factors such as country's economic situation (country wealth), degree of social heterogeneity, international network of the technology, country's own experience with the technology have substantial influence on the diffusion of innovation globally.
Srinivasan, Lilien, & Rangaswamy (2002)	This study proposed technological opportunism construct which is a sense-and-respond capability of firms with respect to new technologies. The results suggested that the impact of technological opportunism, as well as other external and internal factors including institutional pressure and firm's ownership of assets, on the adoption of technology in the organizational settings.
Chandy, Prabhu, & Antia (2003)	This study explored the relationship between dominance and radical innovation. The results suggested that dominance is a multifaceted construct in which individual facets result in differing propensities to innovate. Also, the study showed that managers have divergent expectations of the same new technology and such expectations are important driver of innovation.

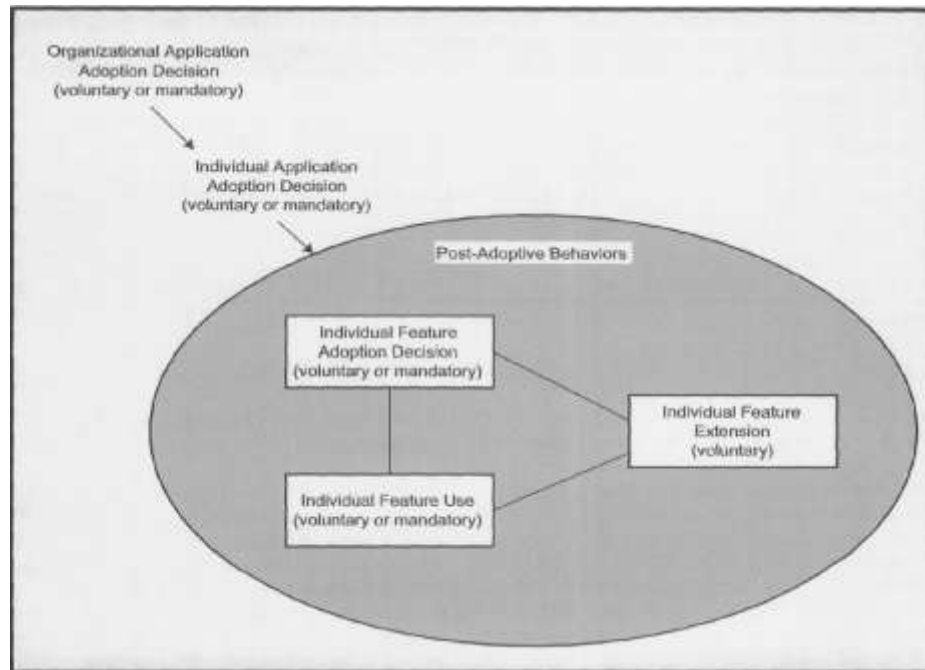
#### 2.1.4 *The Mechanisms (Processes) Shaping the Adoption and Use of Technology*

Besides the research focusing on the determinants of the adoption and use of technology as mentioned in the previous section, some scholars (e.g. Cooper & Zmud, 1990; Kwon & Zmud, 1987; Saga & Zmud, 1994) interested in the processes in which

the use of technology is adapted according to context. These scholars criticized the literature on the determinants of the adoption and use of technology. These scholars stated that the use of technology (particularly in the organizations) should be shaped by the factors at different levels (e.g. organizational level and individual level), as such, it is important to examine the interactions of factors at the different levels. They believed that the mechanisms (processes) shape the adoption and use of technology should be the focal point. For example, in responding to many organizations' practical dilemma in which the heavily invested technology was aborted after a short-term use due to the unwillingness to continuously use, scholars conducted studies (e.g. Cooper & Zmud, 1990; Kwon & Zmud, 1987; Saga & Zmud, 1994) to identify the factors and the dynamics that influence the continuous use of technology after adoption. The introduction of this stream of study provides a foundation for this study to identify the interactive relationships among the factors in different contexts (e.g. everyday life and travel contexts).

Jaspersen, Cater, and Zmud (2005) synthesized the factors identified in prior research and conceptualized the mechanism shaping the post-adoptive behavior. They defined post-adoptive behavior as “the myriad feature adoption decision, feature use behaviors, and feature extension behaviors made by an individual user after an IT application has been installed, made accessible to the user, and applied by the user in accomplishing his/her work activities” (p. 531). They situate the post-adoptive behavior within a broader three-stage model of IT adoption and use (Figure 3). The first stage is about the adoption behavior of organizations. The second stage is about the initial adoption by the individuals in the organization. This kind of adoption can be both voluntary and mandatory. The third stage happens after an individual adopt the

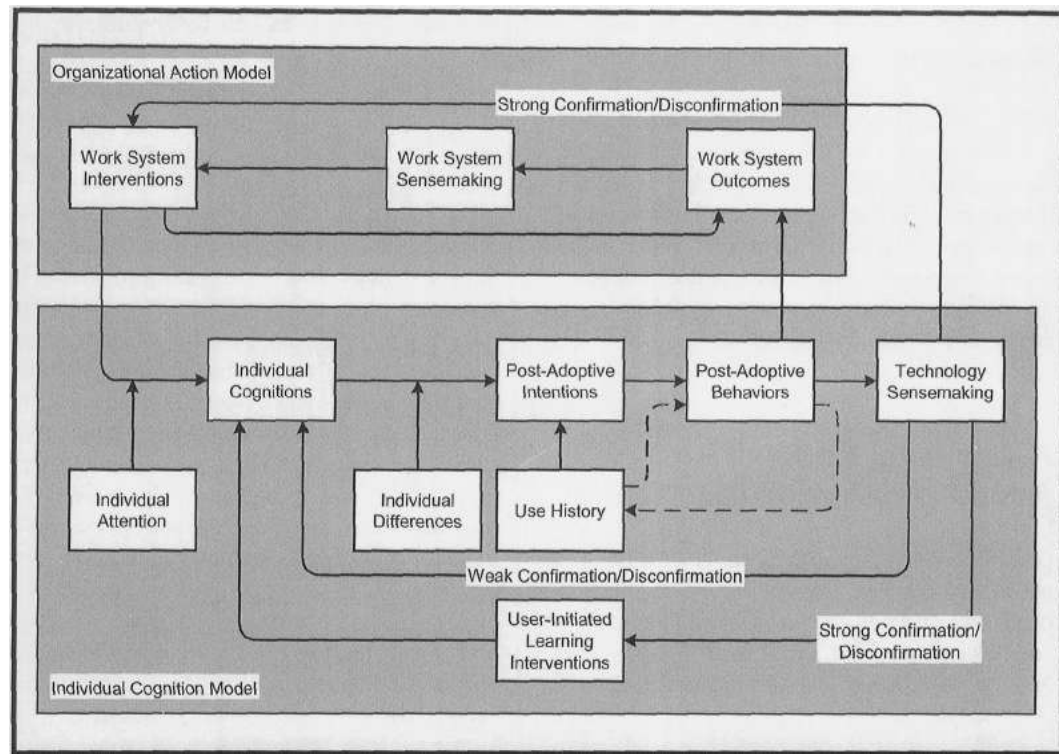
technology during the second stage. In this stage, the individual actively chooses to explore, adopt, use and possibly extend one or more features of the technology. Also, these decisions to choose features to use may occur voluntarily or mandatorily because the individual is situated in an organizational setting.



**Figure 3. Feature-centric View of IT Adoption and Use**  
(adopted from Jasperson et al., 2005, p. 531)

Specifically, Jasperson et al. (2005) applied a two-level model to illustrate the mechanism shaping the post adoptive behavior (Figure 4). Based on the premise regarding the dialectic relationship between organization and individuals' cognitive processing and cognitive content (Bandura, 1995), they illustrated that the post-adoptive behavior is shaped at two levels: individual's cognitions and behaviors regarding feature adoption, use, and extension and organizational context within which these individual

cognitions are situated. Within their model, the individual cognitions that determine post-adoptive intentions or behaviors are shaped by interventions emanating from the organization level (i.e., work system interventions) or individual level or both.



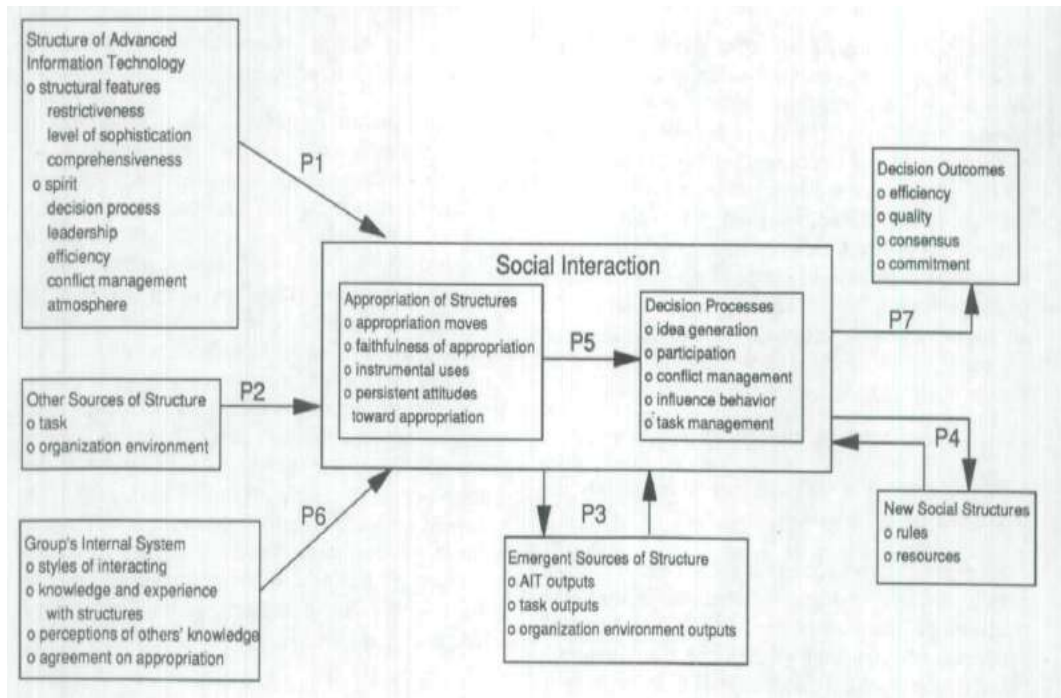
**Figure 4. Conceptual Model of Post-Adoptive Behavior**  
(adopted from Jaspersen et al., 2005, p. 533)

Another research stream is about the appropriation process of technology use in organizations. According to DeSanctis and Poole (1994), appropriation of technology is an ongoing practice whereby people interact with technology and then actively select structures of use from a large set of possibilities. The impact of technology on the organization or on the society depends on the appropriation process because this process determines the actual usage of technology by users in specific context (Wheeler &

Valacich, 1996). The more flexible the technology is in terms of use, the more important the appropriation process for the performance of technology because user has autonomy to make decisions on what features they use and how they use (Bar, Pisani, & Weber, 2007).

DeSanctis and Poole (1994) studied the implementation of group decision support system (GDSS) in an office environment. They developed Adaptive Structuration Theory (AST) arguing that when a GSS is first introduced into a group, the group goes through an appropriation process by which members examine the structures and agree on when and how to use them, and eventually their existing norms and routines adapt to include some, all, or none of the new structures. Figure 5 presents the process in which the users incorporated the GDSS in their practice and the factors influencing such process. There are three kinds of input factors influencing the appropriation process: the structure of advanced information technology (i.e. GDSS in their study), structures set up by task or organization environment, and group's internal system (e.g. existing styles of interacting). These input factors work together to shape the appropriation process. The appropriation process, first, starts with a selection from possible appropriation moves because the group can appropriate a given technology in different ways. For example, the group may choose to (1) directly use the technology as it is designed, (2) relate the technology to other things (e.g. procedures, tools) existing, (3) constraint or interpret the technology in use, or (4) make judgments about the technology. Second, the appropriation can be faithful (consistent with the design features of the technology) and unfaithful (improper use or innovative use). Third, the users can choose to appropriate the features of technology for different instrumental uses. That means users can selectively use the features of

technology depending on their specific contexts. Finally, with the use of technology, users will develop attitudes towards the features of technology. The output factors in this process are new social structures (interaction styles), new decision processes, and different decision outcomes.



**Figure 5. Summary of Major Constructs and Propositions of Adaptive Structuration Theory**  
(Adopted from DeSanctis and Poole, 1994, p. 132)

In summary, the above literature frames this study within four streams of research (i.e. the use of smartphones for travel, ICT and travel, the factors influencing the adoption and use of technology, and the mechanisms shaping the individual adoption and use of technology in organization). These studies suggest that smartphones has been adopted as one of important ICT tools for travel planning, travel facilitation, and experience

management (e.g. documenting and photo sharing). The use of smartphones for travel may originate from traveler's information needs, contextual factors in travel, and travelers' decision-making schema (e.g. travel planning style). Also, as one of the ICT tools, the use of smartphones may be associated with the cognitive beliefs that are identified to influence the general adoption of ICT tools. In addition, considering the association of everyday life and travel (as discussed in Chapter 1), the use of smartphones for travel may be influenced by the factors at different contexts (i.e. everyday life and travel). The studies regarding the mechanisms shaping the individual use of technology in organizations provided some implications on the interactions of the factors from different contexts. However, the critical review of previous literature demonstrates that the current theories and framework is partially support, however, inadequate to directly apply to study the use of smartphones for travel. Therefore, it is calling for the development of a new theoretical framework from the travelers' rich descriptions of their use of smartphones for travel (Gretzel, 2011). The next section provides the critical reviews of the above mentioned literature streams and develops the problem statement of this study and relevant research questions.

## **2.2 Critique of the Literature, Problem Statement and Research Questions**

The above literature review suggests that the research on travel and ICT provide a foundation for understanding the use of smartphones in the context of travel. However, a critical examination of this literature suggests that more work is needed to develop a comprehensive understanding of this phenomenon. That is, it is argued that this literature provides an inadequate guide for empirically investigating the use of smartphones for travel for three fundamental reasons.

First, the current understandings of the use of smartphones for travel are established from quantitative methods and employed survey instrument to acquire travelers' responses on the list of smartphones use activities. Such method is argued to be inadequate to understand the essence of the use of smartphones for travel. The quantitative method separated the subject (i.e. travelers) and object (i.e. the use activities of smartphones) by eliminating the meanings that subject assigned to the object. As such, the heterogeneous determined meanings of the use of smartphones by different travelers cannot be investigated. However, according to transcendental science (Descartes, 1977), a science that concerns the connections between human consciousness and the objects that exist in the material world, these determined meanings are the essence of the phenomenon and the base of knowledge because "knowledge of objects resides in the subjective sources of the self" (Moustakas, 1994, p. 44). Therefore, in order to understand the essence of the use of smartphones for travel and further understand the antecedents and outcomes of such use, this phenomenon should be investigated from a qualitative perspective, as a complement of the findings of quantitative research. That is, the use of smartphones should be understood from the travelers' descriptions on their use under specific circumstances and the meanings that they assigned to the activities.

Second, there is lack of integration of the studies regarding the nature of the use of ICT in travel (i.e. traveler's information needs, travel decision-making) and the theories regarding the adoption and use of technology based upon research in MIS, communication, and marketing. On the one hand, in the studies regarding the adoption of smartphones for travel, only the general cognitive beliefs such as perceived usefulness, perceived ease of use, are identified in the theories of technology adoption, were

integrated in the models to predict the intention to use smartphones for travel. However, traveler's information needs, travel decision-making features, and other contextual factors have been identified to be influential for the use of ICT tools in travel (Buhalis & Law, 2008; Vogt & Fesenmaier, 1998; Wang, Park, & Fesenmaier, 2011). On the other hand, the theories regarding the adoption and use of technology based upon research in MIS, communication, and marketing focus on the adoption and overall use of technology. However, considering the idiosyncratic nature of travel decision making process and the tourism experience itself, the factors influencing the overall use of technology can be vary under specific travel circumstances. Also, considering that smartphones is an agglomeration of multiple digital devices and have capability to extent its information services through installing applications, the use of smartphones for travel can be vary from travelers and from trips. As such, the factors associated with the use of different functions of smartphones can be different. Therefore, it is argued that it is important to consider the use of smartphones within the specific context of travel.

Third, it is argued that the processes shaping the use of technology which were developed in the organizational settings have been inappropriately applied at the individual level and as such, should be critically examined within the individual travel context. The studies regarding the processes shaping the use of technology investigated the interactions of factors at organizational and individual levels. However, in travel, the consideration of factors at the organizational level is inappropriate, instead, the factors from everyday life (e.g. the use of social network, the learning of smartphones apps) may emerge to interact with the factor from travel and finally determine the use of smartphones for travel.

In summary, based on the above three arguments developed from the critics of the extant literatures, the problem statement of this study is constructed as following:

***“There is a need to develop a theoretical framework that can guide the investigation of the use of smartphones for travel.”***

In the following sections, each of these issues is critically examined and specific research questions are developed.

### *2.2.1 The Essence of the Use of Smartphones for Travel*

The extant literature did not identify the essence of the use of smartphones for travel. According to transcendental science, a science emerged with a growing discontent with the science adopted positivist philosophy (Descartes, 1977), the essence of the phenomenon resides in the subjective sources of the self, including sense (phenomena empirically given in perception), imagination (necessary to arrive at a synthesis of knowledge), and apperception (consciousness of the identity of things) (Moustakas, 1994). Also, in order to explore the essence of phenomenon, the researchers should adopt “a new way of looking at things, a return to things as they actually appear” (Moustakas, 1994, p.45). That is, researchers should abstain from making suppositions and study topics in a fresh and naïve perspective. Therefore, the essence of a phenomenon needs to be explored through the descriptions and interpretations of the subjects. However, the extant studies investigated the use of smartphones for travel by listing standard activities based on the functions and applications available on the smartphones platform and asking for the confirmation from travelers (Kramer et al., 2007; Wang, Park, & Fesenmaier, 2012). In such way, the meanings that travelers assigned to the use activities of

smartphones (i.e. their perceptions, interpretations, and experience) are covered by the standard questionnaire. Thus, the essence of the use of smartphones for travel cannot be understood from a comprehensive perspective. The understanding of the essence of the use of smartphones for travel will provide a base to further investigate the factors shaping these activities. In order to acquire the essence of the use of smartphones for travel, the suppositions should be abstained and a fresh and open perspective should be adopted. Travelers' descriptions and interpretation should be the only source of the truth. Therefore, the first research question in this study is:

***Research Question 1:***

***What are the use of smartphones in the context of travel?***

***2.2.2 The Factors influencing the Adoption and Use of Smartphones in Travel***

The studies in the fields of management information systems (MIS), communication, and marketing provide a solid foundation and a reservoir of the determinants of technology adoption and use. Some of determinants have been verified in the studies regarding the use of smartphones for travel (i.e. Eriksson & Strandvik, 2009; Kim, Park, & Morrison, 2008; Kim, Ahn, Chung, 2012; Peres, Correia, Moital, 2010; Tsai, 2010). However, the findings from those literatures cannot be directly applied to this study. It is imperative to critically examine the factors influencing the use of smartphones for travel due to the differences in the contexts of travel and business (i.e. organizations and market), where the most of studies regarding the adoption and use of technology are grounded.

In the theories of technology adoption and use, some determinants emerged from

the organizational settings. For example, in the TAM model and its extensions, the social influence is normative and related to extrinsic motivations for job performance and advancement (Stafford & Stafford, 1998). The facilitators are mainly about the factors in the organizational environment. When adopting and using the smartphones for travel, the relationship between the user and the organization does not influence the activities. Therefore, the determinants identified in this research stream may not be effective in this study and new determinants may emerge in the new context. In the marketing literature, the studies highlight the importance of contextual factors for the adoption and use of technology by the organizations. However, this stream of research provides limited implications for this study because the use of smartphones for travel is at the individual level and independent from the business environment.

In the context of travel, new contextual factors emerged with the disappearance of the organizational and business environmental factors. For example, traveler's information needs were identified as the direct motivations of the use of ICT tools (Vogt & Fesenmaier, 1998). The features of trips (e.g. first-time visit or revisit) directly determine the extent to which ICT tools were used for travel planning (Fodness & Murray, 1998). All these contextual factors in travel are important in determining the different use activities of smartphones, considering the flexibility of smartphones use due to unique design features of smartphones (i.e. the agglomerate of multiple devices and the capability to extent information services through smartphones applications).

Therefore, the factors influencing the use of smartphones for travel need to be explored with an open mind. The constructs in the theoretical framework should be identified from the rich description of traveler's experience. Thus, the second research

question and relevant study objective in this study is:

***Research Question 2:***

***What are the factors affecting the use of smartphones in the context of travel?***

*2.2.3 The Processes Shaping the Use of Smartphones*

The aforementioned studies regarding the process in which people adapt the technology in their context and make the “technology-in-use” provided important implications on the mechanisms shaping the use of smartphones. On the one hand, Jaspersen et al. (2005)’s conceptualization of the post-adoptive behavior contribute to this study from two perspective. First, they adopted the “feature-centric view of technology” which states that “features of a technology are interpreted (and possibly adapted) by individual users so as to constitute a technology in-use” (p. 529). This view deconstructs the adoption and use of technology into the adoption and use of the features of technology. And they identified that the variations in the use of technology as well as the outcomes of such use originates from the heterogeneity of users in using different features of technology. Also, they recognized that people adopt the features of technology based on the contextual factors such as task-fit. The study of the use of smartphones indeed needs the feature-centric view of technology to deconstruct the use of smartphones into the use of different features. Second, they explained that individual cognitions that lead to post-adoption behavior are shaped by both contextual factors (i.e. organizational factors in their study) and individual factors such as traveler’s background in using ICT tools. These are important dimensions for the use of smartphones for travel context.

On the other hand, DeSanctis and Poole (1994)'s study suggested a new perspective to explore the factors and mechanisms influencing the use of smartphones for travel. The smartphones are very "flexible" information communication technology for their usage because they are the extension of Internet in a mobile platform and they provide a large amount of information services. Also, the smartphones are programmable through the software (mobile applications) they use, so that their configuration can be different from users. As such, the actual use of smartphones depends on the appropriation of the smartphones by users. According to the report "2012 Mobile Future in Focus" by comScore, the mobile activities that people most likely engaged in are varied for communication, information acquisition, entertainment, and online shopping, and the applications installed in each user's mobile device are varied in numbers and categories. This provides evidence that people use the smartphones in different ways. The appropriation of smartphones in people's everyday lives can also influence the use of smartphones for travel context. For example, considering that the planning and facilitation of leisure activities (e.g. dining out, go to watch movie) are similar in nature to the activities of travel planning and facilitation, it is possible that the use of smartphones for planning and facilitating leisure activities can lead people to use the smartphones for travel planning and facilitation. However, probably many other factors originating from the everyday use of smartphones may influence the actual use of smartphones for travel planning and facilitation, such as habit of using smartphones to search information, the influences from family or friends on the use of smartphones.

However, both processes suggested by Jasperson et al. (2005) and DeSanctis and Poole (1994) are inappropriate for directly application in this study because these

processes were developed in the organizational settings and the contextual factors are organizational context. The mechanism shaping the feature selection and use of technology in personal context can be quite different from the ones within the organizations. For example, in travel, the factors from everyday experience (e.g. the use of social network, the learning of smartphones apps), instead from any organizations, may emerge to interact with the factor from travel and finally determine the use of smartphones for travel.

Based on the above discussion, it is recognized that existing mechanisms that are identified to shape the adoption and use of technology cannot provide accurate explanation on the mechanisms shaping the use of smartphones for travel. Therefore, the third research question and corresponding study objective is:

***Research question 3:***

***What are the mechanisms shaping the use of smartphones for travel (i.e. How are the factors working to shape the use of smartphones in the context of travel?)***

It is argued that by addressing the three research questions, this study will be able to develop a theoretical framework sufficient to describe the nature of use of online mobile devices, the mechanisms shaping their use, and the impact of their use on the travel experience.

### **2.3 Chapter Summary**

This chapter provided a foundation for the design and implementation of this study. First, based on the nature of the phenomenon (i.e. the adoption and use of

information communication technology in travel), this chapter placed this study in four streams of literature: 1) the use of smartphones for travel, 2) information communication technology (ICT) and travel, 3) the factors influencing the adoption and use of technology, and 4) the mechanisms shaping the individual adoption and use of technology in organizations. The review of these four streams of literatures presented four relevant areas of knowledge: 1) the extant understanding of the use of smartphones for travel; 2) the role of information in travel and the factors from travelers and travel context that may influence the use of smartphones for travel; 3) the cognitive beliefs that may influence the use of smartphones for travel; and 4) how the factors from different contexts interact to lead to use of technology.

Second, the aforementioned four streams of literatures are critically examined for the application in this study. The critical review of previous literature identified three fundamental problems that impede the direct application of these extant theories and finding in this study. The three fundamental problems are 1) the lack of understanding of the essence of the use of smartphones for travel; 2) the lack of integration of the studies regarding the nature of the use of ICT in travel (i.e. traveler's information needs, travel decision-making) and the theories regarding the adoption and use of technology; and 3) the inappropriateness caused by the different nature of study contexts (i.e. organizational level V.S. individual level). Therefore, it is critical to develop a new theoretical framework to study the use of smartphones for travel from the travelers' rich descriptions (Gretzel, 2011).

At the end of this chapter, the problem statement of this study is framed as ***“There is a need to develop a theoretical framework that can guide the investigation of the use***

*of smartphones for travel.*” Three research questions are developed as following:

*(1) What are the use of smartphones in the context of travel?*

*(2) What are the factors influencing the use of smartphones in the context of travel?*

*(3) What are the mechanisms shaping the use of smartphones in the context of travel (i.e. How are the factors working to shape the use of smartphones in the context of travel?)*

In next chapter, the paradigm guiding the design of this study and methods leading to the achievement of study objectives are introduced.

## **CHAPTER 3. RESEARCH APPROACH**

The first two chapters of this thesis provided an overview of the study, analyzed the nature of the problem, and placed the study in the context of travel and the adoption and use of technology. Based on the discussion of the importance of the focal phenomenon and the critical review of the extant literature, the overall goal of this study was confirmed to *develop a theoretical framework describing the mechanisms shaping the use of smartphones for travel*. And the following three research questions were proposed:

- (1) What are the use of smartphones in the context of travel?*
- (2) What are the factors influencing the use of smartphones in the context of travel?*
- (3) What are the mechanisms shaping the use of smartphones for travel (i.e. How are the factors working to shape the use of smartphones the context of travel?)*

This chapter will explain the underlying research paradigm of the study and describe the overall research design. Also, this chapter will present the details of research design and specific research procedure, including the preparation of data collection materials, the procedures of data collection and data analysis. Finally, the strategies and tactics applied to guarantee the “trustworthiness” (Lincoln & Guba, 1985, p. 294) of the study (i.e. the reliability and validity of the study) will be described and the relevant results will be reported.

### **3.1 The Research Paradigm: A Phenomenology Approach**

A research paradigm refers to a world view and a way of breaking down the complexity of the real world (Patton, 1990). As Dilly and Romiszowski (1997, p.34)

defined that the research paradigm is an interpretive paradigm defining “how the world works, how knowledge is extracted from this world, and how one is to think, write, and talk about this knowledge”. Usually two kinds of research paradigm are followed in the fields of social sciences: qualitative and quantitative paradigms. The qualitative paradigm emphasizes the “socially constructed nature of reality” (Denzin & Lincoln, 2007, p.14). That is, qualitative researchers believe that the world is multiple and dynamic realities that are context-dependent. As such, qualitative researchers believe that the knowledge can only be understood through participants’ descriptions of contexts and their interpretations of the reality (Patton, 1990). They conduct studies to examine “how the social experience is created and given meaning” (Denzin & Lincoln, 2007, p. 14). With their beliefs towards the reality and knowledge, qualitative researchers emphasize the intimate relationships between the researcher and what is studied (Denzin & Lincoln, 2007). In contrast, the researchers applying the quantitative research paradigm view the world as the realities that can be objectively measured (Cohen & Manion, 1980). As such, the quantitative research paradigm emphasizes the causal relationships of variables and focuses on the measurement of variables in terms of quantity, amount, intensity, or frequency (Creswell, 1994). The quantitative researchers believe that the reality should be objectively measured rather than subjectively interpreted, so they use structured survey instrument to collect data.

According to Creswell (2007), “research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem” (p.37). The philosophical assumptions mentioned by Creswell refer to the assumptions of ontology

(i.e., what is the nature of reality?), epistemology (i.e., what is the relationship between the researcher and that being researched?), and methodology (i.e., what is the process of research?). The clarification of these assumptions is important because they guide the selection of quantitative or qualitative research design, lead the design of data collection and data analysis, and serve as references for the quality evaluation of the study (Guba & Lincoln, 1985).

In ontology, the focus of this study is the mechanisms shaping the “phenomenon” of the use of smartphones in travel. According to Moustakas (1994), the phenomenon is what appears in consciousness. That is, the objective knowledge is intertwined with subjective knowledge and best to be explored through the interpretation of subjects (Husserl, 1973). Also, those factors may be heterogeneous in the population because travel experience is distinct for each traveler (Jennings, 2005). As such, the reality that this study is exploring can be considered “subjective and multiple, as seen by participants in the study” (Cresswell, 2007, p.17). Therefore, the qualitative research paradigm is appropriate for this study, which is built on the ontological assumption that reality is subjectively constructed and multiple realities coexist (Lincoln & Guba, 1985).

Based on the above ontology assumption, in epistemology, it is important for researchers to conduct in-depth communication with informants to acquire detailed information. The use activity of smartphones for travel happens in the specific circumstance, which consists of diversified factors such as the purpose of travel, travel companion, the on-site situation, etc. All these contextual factors lead to the use activities of smartphones in the specific circumstances in travel. As such, the factors influencing the use activities of smartphones should be identified from the rich description of travel

experience.

Last, in methodology, the research process for a qualitative study is iterative for the purpose to adjust the research strategy according to the findings emerging from the informants (Catherine & Rossman, 2006; Hatch, 2002). This is a process that is appropriate for this study. The quantitative research paradigm requires clear identification of the variables and accurate measurement of the constructs. However, the current literature provided a limited understanding on the understanding of the factors driving the use of smartphones for travel. Thus, this study should be conducted in an exploratory nature to identify the relevant concepts and possible relationship from the field. As suggested by Creswell (2007), this study has to adjust data collection strategy with the progress of data collection and data analysis. For example, the interview protocol was developed through pilot study to make sure that the rich descriptions from the informants can provide evidence to answer the research questions. With the progress of data analysis, the follow-up interviews were launched with the interviewed informants to clarify the information they provided and confirm the researcher's interpretation.

In summary, the qualitative research paradigm is appropriate for this study. The "reality" (phenomenon) explored by this study is socially constructed in nature and only can be approached through the in-depth communication with the subjects who had the relevant experience. The data collection needs to be adjusted based on the concepts emerging from the preliminary data analysis to ensure the exploration of all the possible areas. According to Creswell (2007), there are usually five qualitative approaches to inquiry (i.e. narrative research, phenomenological research, grounded theory research, ethnographic research, and case study research). Base on the nature of research questions,

this study adopted the phenomenological approach. The following paragraphs introduce the phenomenological approach and the application in this study.

The phenomenology refers to “the knowledge as it appears to consciousness, the science of describing what one perceives, senses, and knows in one’s immediate awareness and experience” (Moustakas, 1994, p.26). The basic purpose of phenomenology is “to reduce individual experiences with a phenomenon to a description of the universal essence” (Creswell, 2007, p. 58). The phenomenology emphasizes “subjectivity and discovery of the essences of experience and provides a systematic and disciplined methodology for derivation of knowledge” (1965, p. 5-6).

This study employs the phenomenology approach to investigate the research questions. The purpose of this study is to identify a phenomenon, “an object of human experience” (van Manen, 1990, p. 163) as perceived by informants. Specifically, the phenomenon is the mechanisms shaping the use of smartphones in the context of travel. This study acknowledges the role of consciousness of informants in reflecting both subject and object and the integrity of subject and object. This study attempts to eliminate pre-judgments and pre-suppositions to explore the nature of the use of smartphones in travel and the factors influencing these use activities. The final goal is to derive the essences of such experience, which is to identify the theoretical concepts and the relationships among these theoretical concepts that shape the use activities of smartphones. Therefore, the phenomenology approach is appropriate for this study.

The design of this study were guided by three philosophical perspectives in phenomenology (Stewart & Mickunas, 1990): a philosophy without presuppositions, the intentionality of consciousness (knowing reality from the interpretation of informants),

and the refusal of the subject-object dichotomy. Specifically, the three philosophical perspectives are reflected in the following seven core facets of phenomenology research method (Moustakas, 1994, p.58-59). Table 6 presents the seven core facets (right column) and illustrates the application of these core facets in this study (left column).

### **3.2 Study Design**

Following the discussion of the phenomenology approach, the design of the study is introduced across three sub-sections of informants, data collection (materials and procedures), and data analysis. The section on informants describes the selection criteria of informants (i.e. interviewees) and the rationale. The data collection section presents the materials used to recruit informants, interview protocol and the steps of data collection. Last, the analysis section describes the procedures used to process the data. Finally, standards of validation and evaluation (“trustworthiness”) as well as the procedures to satisfy these standards are described.

#### *3.2.1 Informants: Qualifications and Recruitment*

In order to acquire rich descriptions on the interested phenomenon (i.e. the use of smartphones for travel and the factors influencing such use), qualified informants met the following three criteria. First, the informants should own and use smartphones (i.e. the mobile phone using any of the following operating systems: Apple iOS (e.g.iPhone), Android (e.g. HTC Hero, Nexus One, Galaxy Nexus), or RIM (e.g. Blackberry)). These are the top three smartphones platforms in 2011 and the first quarter of 2012, with more than eighty percent of subscribers in the U.S. (comScore, 2012).

**Table 6. The Application of Core Facets of Phenomenology Approach**

<b>Core facets of phenomenology approach</b>	<b>The applications in this study</b>
1. Phenomenology focuses on the appearance of things, removed from everyday routines and biases, from what we are told is true in nature and in the natural world of everyday living.	The interview questions remains open to encourage the informants to describe their own experience and illustrate their opinions in their ways. The inquiries are designed to avoid misleading words.
2. Phenomenology is concern with wholeness, with examining entities from many sides, angles, and perspectives until a unified vision of the essences of a phenomenon or experience is achieved.	This study randomly selected the informants from the people who own and use smartphones, traveled more than three times in past 12 months, and one of trip was during the past three months. The interviews continue until the patterns emerge. Then the interview transcripts from different informants were analyzed to identify the concepts and relationships. The concepts and relationships were organized into an emergent framework.
3. Phenomenology seeks meanings from appearances and arrives at essences through intuition and reflection on conscious acts of experience, leading to ideas, concepts, judgments, and understandings.	The data analysis is an iterative process. The interview transcripts were read to identify the codes, and coded and recoded to ensure the raw materials are assigned into appropriate concepts. The possible relationships were explored by reading the transcripts and continuously reflections.
4. Phenomenology is committed to descriptions of experiences, not explanations or analyses. Descriptions retain, as close as possible, the original texture of things, their phenomenal qualities and material properties.	All the conclusions are identified from the descriptions of informants. The results present the original descriptions as evidences to support each point in conclusion.
5. Phenomenology is rooted in questions that give a direction and focus to meaning, and in themes that sustain an inquiry, awaken further interest and concern, and account for our passionate involvement with whatever is being experienced.	The interview questions are designed to be both specific enough and open enough. The interview questions are specific to ensure the informants to talk about their experience relevant with the interest of this study. Also, the interview questions are open to encourage informants to describe the relevant experience with a free mind and without any researcher's misleading.
6. The data of experience, my own thinking, intuiting, reflecting, and judging are regarded as the primary evidences of scientific investigation.	A large amount of evidences of thinking were created to record the process of codes book development and the coding and recoding of interview transcripts.
7. The interview questions must be carefully constructed, every word deliberately chosen and ordered in such a way that the primary words appear immediately, capture informant's attention, and guide and direct informant in the phenomenological process of seeing, reflecting, and knowing.	The interview protocol was developed through two phases. First, the pretest with the purpose of questions development was conducted with six informants to ensure the interview cover the interest of this study. Second, the pilot study with the purpose of language modification was conducted with five informants to ensure the understanding of interview questions.

Second, the informant should travel for leisure (non-business) purpose at least three times in the past twelve months (from May 31<sup>st</sup>, 2011 to May 30<sup>st</sup>, 2012). The trip

refers to pleasure, vacation or personal trip that were at least 50 miles, one way away from home, and that included an overnight stay. Considering that the planning and activities of business trips are usually out of travelers' control, business trips are excluded from this study. Also, one of the leisure travels should happen within the past three months (from February 1<sup>st</sup> to May 31<sup>st</sup>, 2012). This criterion is to ensure that the informants can recall the details of travel experience and provide rich descriptions of their experience.

Third, the informants should subscribe unlimited data plan in using smartphones communication service. The focus of this study is to explore the factors influencing the use of smartphones for travel which originate from the travel context and everyday life. Therefore, this study tried to limit the influence of the factors which originate from the technique perspective. In addition, the demographics are not the criteria to select informants because the goal of this study is to achieve "a unified vision of the essences of a phenomenon or experience" (Moustakas, 1994, p.59). The understanding of the variance of this phenomenon in the population is not the goal of this study.

### *3.2.2 Data collection: Procedures and Materials*

This study employed in-depth interview to collect data. There are four stages in the data collection process (i.e. pre-test, pilot study, formal interview, and follow-up interview). The following sections describe the purpose and procedures in each stage.

First, the purpose of pre-test is to develop interview protocol and test the logistics of the interview (e.g. the equipment of audio recorder). The initial interview questions were developed based on the three research questions and organized to

encourage the rich descriptions. The research students and faculties in the School of Tourism and Hospitality Management, Temple University were approached during May 14<sup>th</sup> to May 18<sup>th</sup>, 2012. The consent forms (Appendix A) were signed by all the informants and the interviews were tape recorded. The pre-test ended with six interviews because the interview protocol was evaluated to be adequate to explore the research questions and be clear for the informants. The interview transcripts from the pre-test were not included in the final analysis because of the “experimental nature” of the pre-test.

Second, the purpose of pilot study was to simulate the formal interview procedures and further modify the wordings of interview questions. The interviews in the pre-test stage were face-to-face interviews with friends and acquaintances, and four out of six were non-native speakers. However, the formal interviews were expected to be telephone interview and with strangers and native speakers. Therefore, the pilot study was designed to test the logistics of telephone interviews and native speakers’ understanding of interview questions. Ten undergraduate students recruited in the class THM1311, Spring 2012 were contacted. All of them are American. Five qualified students accepted telephone interview during May 21<sup>st</sup> to May 25<sup>th</sup>, 2012. The compensation of a \$10-dollar gift card was send to each student informant after the completion of interview. The telephone interviews were tape recorded and all the informants signed the consent form. The pilot study indicated the limited difference between face-to-face interview and telephone interview (except the occurrence of over-talking in the telephone interview) in terms of the response of informants and the understanding of interview questions. The five interview transcripts in the pilot study were included in the final analysis because the same interview protocol was applied as in

the formal interviews. The profiles of five interviewees are provided in Appendix B. The pilot study confirmed the following interview protocol (seven main questions) which was applied in the formal interviews:

***Interview protocol:***

*1. How long you have used your smartphones?*

*=> What are the most frequently used applications?*

The purpose of this question is to acquire the background information about the informant's use of smartphones, and remind the informants about the functions and apps they used.

*2. How do you use your smartphones in most days of your life?*

*=> Can you describe a typical day of the use of your smartphones?*

The purpose of this question is to lead the informants to describe the use of smartphones and identify the use activities of smartphones in everyday life.

*=> Do you feel any changes in terms of your everyday habits/routines or patterns of behavior brought by the use of smartphones?*

The purpose of this question is to explore the relationship between the informant and smartphones, which may serve as a foundation to interpret the use of smartphones in travel.

*3. Can you briefly describe your travel activities for leisure purpose in the past 12 months?*

*=> Can you describe the most recent trip in the past three months, for example, the destinations, travel companion, how long of the trip, and the main activities?*

The purpose of this question is to lead informant to recall his/her travel experience.

*4. For the most recent trip you mentioned, how did you use smartphones to plan or facilitate your trip?*

*=> Have you used your smartphones to plan your trip before departure?*

*==> Why you used smartphones to do so, rather than other alternatives?*

*==> Have you used your smartphones to help you during your trip?*

*====> Why you used smartphones to do so, rather than other alternatives?*

*==>How about after trip, did you do any follow-up activities with your smartphone?*

The purpose of this question is to explore the use activities of smartphones in the whole travel process, and to identify the factors driving these use activities.

*5. How do you know these functions or information services are available on the mobile platform?*

*==>How did you learn about \_\_\_\_\_ (the function or information service the informant mentioned).*

The purpose of this question is to explore associations between the use of smartphones in travel and the use of smartphones in everyday life.

*6. Thinking about your travel planning and experience before you use smartphones, how many differences do the use of smartphones cause?*

The purpose of this question is to explore the impact of the use of smartphones on travel experience including travel planning, travel activities, and other emotional influences.

*7. Thinking about your use of smartphones in your everyday life and your use of smartphones in your travel, do you feel any difference in terms of the functions and information services you used?*

The purpose of this question is to explore associations between the use of smartphones in travel and the use of smartphones in everyday life.

Third, the formal interviews were conducted during May 31<sup>st</sup> to June 11<sup>th</sup>, 2012.

The informants were recruited through a survey sampling company (Survey Sample International, SSI), who operate an online survey panel with 300,000 Americans. The following procedures were followed:

- A screening online survey (Appendix C) was sent out to identify the qualified informants;
- The qualified respondents who indicated the willingness of participation were contacted by the invitation email. The consent form was attached for signature. The

qualified respondents were asked to set up the interview appointment.

- All interviews were conducted through telephone and tape recorded.
- The “Thank you” letter was sent to the informant after the completion of interview.
- \$30 dollars was paid for each informant through the survey sample company after the interview.

The formal interview ends up with nineteen interviews because the data analysis demonstrated that the concepts and patterns have been stable at the 15<sup>th</sup> informant. That is, the analysis of the last four informants (informants 16<sup>th</sup> to 19<sup>th</sup>) did not lead to any changes of codebook. The informants’ profiles are listed in Appendix B.

Finally, the follow-up interviews were conducted to clarify the points mentioned by the informants, confirm researcher’s interpretation, and further explore the relationships among concepts which were identified in the data analysis. With the progress of data analysis, the need for a follow-up interview was raised. The first-stage of data analysis demonstrated that the evidence of some relationships were weak (e.g. only one informant mentioned or the relationship was indicated, rather than explicitly described, by the informants). As such, the follow-up interview invitations were sent out on July 2<sup>nd</sup> to eleven informants (as allowed by the survey sampling company). The efforts of invitations resulted in seven follow-up interviews which were conducted during July 4<sup>th</sup> to July 7<sup>th</sup>.

### 3.2.3 *Data Analysis*

Qualitative data analysis started with data organization and preparation. The verbatim transcripts were prepared for total 31 interview audio records (5 pilot interviews,

19 formal interviews, and 7 follow-up interviews). Verbalink Corp., a company for transcription service, was hired to prepare the transcripts. Each transcript was double checked by the researcher to ensure the verbatim transcription. Qualitative data analysis is an iterative process to label the informants' descriptions, develop code book, and identify concepts and relationships (Huberman & Miles, 1994). Nvivo 9.0, a qualitative data analysis software, was used to facilitate the management of transcripts and coding process. The unit of analysis was either sentence or paragraph depending on meaning of informant's description.

Based on the purpose of this study, which is to identify both the concepts and the relationships of the concepts, the data analysis of this study consisted of two stages. The first stage was about codes development and the identification of concepts and explicit relationships (i.e. the relationships directly described by informants such as the changes brought by the use of smartphones in everyday life). The second stage was about the identification of inexplicit relationships (i.e. relationships underlying the reports of informants). Specifically, the modified van Kaam (1959) method of analysis of phenomenological data (Moustakas, 1994, p.120-121) was followed to analyze the transcripts in both stages.

### **Stage 1: Code development and concept identification**

The purpose of this stage is to develop code book and identify concepts. The steps are based on Moustakas (1994, p.120-121):

#### *1. "Listing and Preliminary Grouping"*

The "code in vivo" function in Nvivo 9.0 was applied to list every expression relevant to the experience. This function is to use the sentence or paragraph that

was selected to name the code. The selected words can be highlighted in the transcript. In the process to apply “code in vivo”, the sentences or paragraphs describing the same things were grouped.

## 2. *“Reduction and Elimination”*: the development of codes

Each code developed in the first step was tested for two requirements:

- a. “Does it contain a moment of the experience that is a necessary and sufficient constituent for understanding it?” If no, the code is excluded from the further analysis.
- b. “Is it possible to abstract and label it?” If yes, the code was given a “node” (the name of the code in Nvivo).

## 3. *“Clustering and theming”*

The nodes were examined to identify concepts, and then the nodes were classified by concepts. The concepts were labeled by the concepts identified in previous literatures if the nature of meaning are consistent. Otherwise, the concepts were labeled as described by informants.

## 4. *“Final identification” of nodes and concepts*

The coded sentences and paragraphs were checked against their corresponding nodes and concepts. The check is to ensure either the sentences and paragraphs are the explicit expressions of the nodes (e.g. included the work of node) or their meaning are compatible with the nodes and concepts if not explicitly expressed. For example, in responding the question about the changes brought to the life by the use of smartphones in everyday life, the informant #15 mentioned that: “..... I use it for search I want to get movie tickets or things like that over the weekend.

So I kind of do a search when I'm in the car and I'm trying to pull from where I search for movies and movie tickets...”, which was coded as the “InfoAccessTool” because this description indicates that the use of smartphones as a tool to access information.

Appendix D presents a sample of transcript coding outcomes.

The efforts of this stage resulted in a code book with seven sets of codes (i.e. seven concepts) (Appendix E). The seven main concepts are 1) the use of smartphones in everyday context, including four sub-concepts (i.e. communication, entertainment, facilitation, and information search), 2) the changes in everyday experience after the adoption of smartphones, 3) the use of smartphones for travel, including four sub-concepts (i.e. communication, entertainment, facilitation, and information search), 4) motivations driving the use activities of smartphones for travel, including two sub-concepts (i.e. extrinsic motivations and intrinsic motivations), 5) cognitive beliefs towards the use of smartphones for travel, 6) situational and personal facilitators of the use of smartphones for travel, and 7) changes of travel experience, including two sub-concepts (i.e. changes of travel activities and changes of interpretations and sensations). In the above seven main concepts, five of them indicate the relationships between the concepts. First, the changes in everyday context are associated with the use of smartphones in everyday context. Second, the motivations, cognitive beliefs, and facilitators are associated with the use of smartphones for travel. Finally, the use of smartphones for travel are associated with the changes of travel experience.

### **Stage 2: Relationships identification**

The purpose of this stage is to explore the relationships among codes that were

inexplicitly explained by informants. As such, this study examined the descriptions of each informant with a holistic view. That is, the conversation with each informant was considered as a story. The use of smartphones in everyday lives and for travel were considered together to explore the associations between everyday context and the context of travel in terms of the use of smartphones.

The similar steps in the stage 1 were applied, and Figure 6 presents an example of inexplicit relationship analysis:

*1. "Listing and Preliminary Grouping"*

The transcript was read through to list the repeated themes mentioned during each interview. For example, if the use of "checking emails" was mentioned in the conversations about everyday experience, about changes, and about travel experience. This use of "checking emails" was listed as one of repeated themes.

*2. Connecting the stories with repeated evidence*

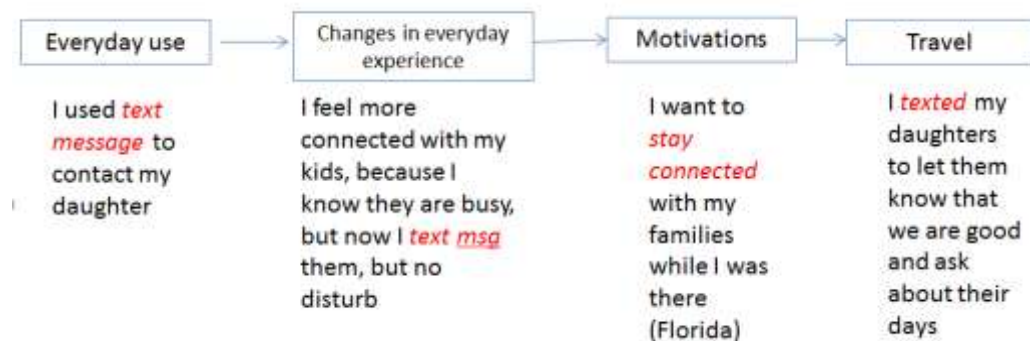
Each repeated theme was analyzed to identify the reasons for repeating. For example, if the "checking email" was found in the conversation about the changes in everyday experience after the adoption of smartphones, the conversation about this topic was reviewed to identify that the "checking email" was used as an example to support the change (e.g. habit) mentioned by the informant. Based on this analysis, the connection between the "checking email" in everyday context and the "checking email" in travel was established through the change in which the "checking email" was used as an example.

*3. "Final identification" of relationships*

The coded relationships were checked to ensure the compatibility of the coded

contents and relationships.

The above efforts resulted in three pairs of inexplicit relationships, including the relationships between 1) the change in everyday experience after the adoption of smartphones and the use activities of smartphones for travel, 2) the changes in everyday experience after the adoption of smartphones and some extrinsic motivations in travel (e.g. Keep connected), and 3) the changes in everyday experience after the adoption of smartphones and some intrinsic motivations (e.g. habit). Appendix F presents a sample of relationship analysis.



**Figure 6 Example of Inexplicit Relationship**

In summary, this section presented the research design of this study. First, the selection of the informants was described and the criteria of selection were justified. Second, a four-stage data collection process was described. The interview protocol was presented and justified. Finally, a two-stage data analysis process was described. In order to guarantee the validation of the data analysis results, the principles suggested by Lincoln and Guba (1985) were followed and the corresponding strategies were applied.

The next section will describe the principles and the strategies taken to assure the ‘trustworthiness’ (Lincoln & Guba, 1985) of the study.

### **3.3 The Trustworthiness of the Study Results**

In a quantitative study the quality of findings is evaluated by the criteria like validity and reliability. Leininger (1994) and other researchers (Lincoln & Guba, 1985; Reason & Rowan, 1981) argued that it was imperative to use qualitative evaluation criteria to assess qualitative methods, because qualitative and quantitative paradigms were radically different in their purposes and philosophical assumptions. Lincoln and Guba (1985) argued that “trustworthiness” is a more appropriate word in the context of qualitative research for validity and reliability. They outlined the trustworthiness of a qualitative research with the terms ‘credibility, transferability, dependability and confirmability’ (Lincoln & Guba, 1985, pp.294-300). In this study, the following strategies were employed to ensure the four aspects proposed by Lincoln and Guba (1985):

Credibility: This refers to the truth, value and believability of the findings. Two strategies suggested by Lincoln and Guba were applied to increase the probability that credible findings can be generated from this study.

First, triangulation refers to the use of different sources and/or methods to verify the results generated from the main data collection methods (Lincoln & Guba, 1985). The purpose of triangulation is to avoid researcher’s subjective interpretations and informants’ unfaithful descriptions. In order to verify the data collected from in-depth interviews, this study employed online survey instrument with open-ended questions (Appendix G) to

collect data from a different population, rather than the panels managed by SSI. This strategy increased the credibility of this study from two perspectives. On the one hand, the survey method can prevent researcher's subjective guidance that may lead the informants in the process of in-depth interview. On the other hand, the collection of the opinions from different population can verify if the bias existing due to the panels managed by SSI. Specifically, the online survey was sent to 10,000 Americans, who requested the materials from vacationfun.com. A \$200 gift card drawing was promised to encourage the participation. The efforts resulted in 43 completed questionnaires, in which all of open-ended questions were answered. The content analysis procedures applied for the interview transcripts (as described in section 3.2.3) were applied to analyze the descriptions collected from the online survey. The results provided the similar coding results. That is, the codes and relationships identified from the online survey descriptions are a subset of the codes and relationships identified in interview transcripts. Appendix H presents the results of the data analysis on the descriptions collected from the online survey.

Second, member checks refer to the practice that sends the data analysis results to the informants who participated in the interview (Lincoln & Guba, 1985). The purpose of member checks is to verify researcher's interpretation of original data with the source of the data (i.e. informants), and minimize researcher's subjectivity in interpreting the meanings from informants. An executive summary of the findings (Appendix I) were sent to twenty-four informants for review. The informants were asked to read the summary and rate the level of agreement (at a 5 level likert-scale) for each paragraph, and also to provide specific comments about the findings. The efforts resulted in five feedbacks.

Appendix I listed the result of member check.

Transferability: This refers to the applicability of the findings of this study in other context or with other subjects. This is different from the concept of generalization in the quantitative study. The transferability in qualitative study depends on the degree of similarity between sending and receiving contexts. Therefore, the researchers should make such similarity judgments possible by accumulating empirical evidence as sufficient as possible to provide enough descriptive data on the studied context. This study documented the following empirical evidence to facilitate the future similarity judgments on the study contexts: 1) the details of data collection procedures and materials; 2) the profiles of informants including gender and age ;and 3) the model of smartphones that each informant used.

Dependability: this refers to the consistency of the study findings. In qualitative study, the researcher “seeks means for taking into account both factors of instability and factors of phenomenal or design induced change” (Lincoln & Guba, 1985) instead of conducting a replication of data collection and analysis. The inter-coder reliability is an indicator of dependability (Krippendorff, 1987). The inter-coder reliability refers to the extent to which two or more independent human coders agree on the coding of the content by applying the same codebook (Neuendorf, 2002). In this study, Krippendorff’s alpha was calculated to measure the inter-coder reliability. The efforts resulted in five sets of Krippendorff’s alpha for five sets of variables, which are all above 0.7 (0.7 is the threshold for inter-coder reliability according to Krippendorff (1987)). Appendix J described the procedures to establish inter-coder reliability and presented the results.

Confirmability: This “refers to repeated direct participatory and documented

evidence observed or obtained from primary information sources” (Leininger, 1994, p.105). An audit trail is recommended as an appropriate method to ensure the confirmability of a qualitative study. The audit trail refers to allow an external consultant to examine both the process and the product of the data analysis (Creswell, 2007). In this study, the following two categories of materials were documented for audit trail: (1) the interview recordings and transcripts; and (2) data analysis records in Nvivo.

### **3.4 Chapter Summary**

This chapter explained the underlying methodology of this study and the specific procedures employed to implement this study. First, the understanding of qualitative and quantitative paradigms was presented to justify the selection of qualitative paradigm as the underlying mythology of this study. Specifically, the philosophical assumptions mentioned by Creswell (2007), including ontology, epistemology, and methodology, were discussed regarding this study to support the selection of qualitative paradigm. Second, the phenomenology approach was introduced as a guideline for the design of the research, because the purpose of this study is to identify a phenomenon, “an object of human experience” (van Manen, 1990, p. 163) as perceived by informants. Seven core facets of phenomenology research method (Moustakas, 1994) were discussed and applied in the context of this study. Third, the overall research design of this study was detailed in three sub-sections of informants, data collection (materials and procedures), and data analysis. The section on informants introduced the selection criteria of informants. The section on data collection described the four-stage processes to recruit informants and develop interview protocol. The section on data analysis presented the two-stage data

analysis process including the coding of the content of interest and the coding of the relationships between the concepts. Finally, the principles and strategies that were applied to increase the trustworthiness of this study were introduced. The results of the applications of these strategies were reported. In the next Chapter, the findings of study that emerged from the implementation of the described method will be presented.

## **CHAPTER 4.**

### **MECHANISMS SHAPING THE USE OF SMARTPHONES FOR TRAVEL**

The implementation of the method described in Chapter 3 resulted in a reservoir of rich descriptions on the use of smartphones in both travel and everyday contexts from twenty-four informants. This chapter organizes the results based on the three research questions. First is a description of the uses of smartphones for travel. These rich descriptions from the informants revealed the context, nature (i.e. the purpose), and the impact of the uses of smartphones on travel experience.

Second, further analysis, focusing on the answers from probing questions regarding the use of smartphones mentioned by informants (e.g. Why did you use a smartphone to do that?”), identified the factors directly driving the use of smartphones for travel. Also, the findings suggest that the use of smartphones in everyday context is an indirect factor influencing the use of smartphones in the context of travel. In addition, the findings indicate that the current use of smartphones might influence the use of smartphones in future trips.

Third, the mechanisms shaping the use of smartphones for travel emerged from the analysis on the relationships among the identified factors. An emergent framework (Figure 8) describes the mechanisms. The mechanisms illustrate that how the factors, which are from different sources (i.e. specific circumstances during trips, travelers) and different context (i.e. everyday life and travel), work together to influence the use of smartphones in the context of travel. Following the description of the emergent framework, three pairs of relationships that are covered in the framework are described including: 1) the changes in everyday context and the influence on the use of

smartphones for travel (*EverydayChanges—TravelSmartphonesUse*), 2) the changes in everyday context and the extrinsic motivations in travel (*EverydayChanges—ExtrinsicMotivations*), and 3) the changes in everyday context and the intrinsic motivations in travel (*EverydayChanges—IntrinsicMottivation*).

#### **4.1 Research Question 1: Use of Smartphones for Travel**

In the analysis of the experiences of twenty-four informants, 25 unique use activities of smartphones emerged (Table 7). The uses represent an organization of four categories according to the purpose of each use: communication, entertainment, facilitation, and information search. The subsequent sections describe these four categories.

##### *4.1.1 Use of Smartphones for Communication for Travel*

The informants used smartphones as communication tools to connect with others through calls, emails, text messages, and social networks (i.e. Facebook) during trips. These communications were either relevant with or irrelevant to the trips that informants were involved in. For example, informants reported calling their families to pass along information of their safety on the road and to share moments of excitements. Informants also called or sent text messages to their families and friends to communicate non-travel related issues. As Informant #8 mentioned:

*“Just calling home to check—we’ve got a daughter-in-law who was getting ready to have a baby at that time and we were calling to check and see how things were going and just checking on her health and everything.”*

Informants reported checking emails to remain informed of the activities and events in the workplace, as Informant #20 mentioned:

“Just to keep up with what’s going on because email is the primary way in my workplace that people contact each other, so if something comes up then I hear about it by email and that’s what I was trying to keep track of.”

**Table 7. The Use of Smartphones for Travel**

Category	Activities	No. of Informants	No. of References
Communication (4 items)	Phone calls ( <i>T_Calls</i> )	9	11
	Send/Receive emails ( <i>T_Email</i> )	8	12
	Send/Receive text msg ( <i>T_TextMsg</i> )	5	6
	Login to facebook ( <i>T_Facebook</i> )	4	8
Entertainment (7 items)	Take photos ( <i>T_Photo</i> )	18	32
	Listen to music ( <i>T_Music</i> )	3	3
	Play game ( <i>T_Game</i> )	2	4
	Read book ( <i>T_Book</i> )	1	1
	Surf on Internet ( <i>T_InternetSurf</i> )	1	1
	Read news ( <i>T_News</i> )	1	1
	Watch movie ( <i>T_Movie</i> )	1	1
Facilitation (6 items)	Navigation during trip ( <i>T_Navigation_d</i> )	13	15
	Check weather info ( <i>T_Weather</i> )	5	5
	Manage itinerary ( <i>T_ItineraryMgt</i> )	4	6
	Track or check in flight ( <i>T_Flightrack/Checkin</i> )	3	5
	Purchase ticket prior trip ( <i>T_TktPurchase_p</i> )	2	4
	Purchase ticket during trip ( <i>T_TktPurchase_d</i> )	2	3
InfoSearch (8 items)	Search restaurant ( <i>T_Restaurant</i> )	15	31
	Search activities ( <i>T_Thingstodo</i> )	7	8
	Search Flight ( <i>T_Flight</i> )	4	4
	Search hotel prior trip ( <i>T_Hotel_d</i> )	4	6
	Search info. from twitter ( <i>T_Twitter</i> )	3	4
	Search deals during trip ( <i>T_Deal_d</i> )	3	3
	Search hotels prior trip ( <i>T_Hotel_p</i> )	2	4
	Search deals prior trip ( <i>T_Deal_p</i> )	1	1

*Note: Reference refers to the sentences or paragraphs describing the specific use activity.*

In addition, informants reported using social networks (i.e. Facebook) during the trip be apprised of friends’ posts and to update statuses. For example, Informant #22 said:

*“Well, because I am such active at Facebook and updating my day-to-day statuses, especially when I was overseas.”*

Informant #17 said:

*“I still kept up with the same routine of checking my Facebook regularly.”*

#### 4.1.2 Use of Smartphones for Entertainment for Travel

The informants reported using smartphones to entertain themselves during trips, particularly in the “down time” in which no programmatic activities are scheduled (e.g. time waiting for a bus, time sitting in the car, etc.) (Kubey, 1986). The smartphones is an agglomeration of functions of multiple digital devices and software such as MP3 Player, Internet Explorer, computer games, camera, and movie player. As such, the travellers used smartphones as self-entertaining devices to take and share photos, listen to music, play games, read books, surf the Internet, read or listen to news, and to watch movies. For example, Informant #20, #10 and #2 mentioned:

*“Yeah, DC I used Pandora during that trip a lot because there was a lot of transit on the Metro and things like that, so there was a lot more downtime so I listened to music and things like that. That was the main other use of the phone I guess, yeah. And I also played a game or two that I downloaded.” (Informant #20)*

*“Just I don’t know. The drive is pretty long, so you just look up stuff – random facts, I guess. Or, just news. Just something to keep busy because it’s like a two hour drive so you got to do something. (so I browsed Internet).” (Informant #10)*

*“And then, again, I remember there was a period of time I was quite bored, so I just watch a movie from Netflix, probably when we were waiting for the airplane.” (Informant #2)*

It seems that the most popular entertainment activity was photographing and sharing with others through social networks (e.g. Facebook, Instagram), emails, or text messages (18 out of 24 Informants reported). Different from other self-entertaining use of smartphones during travel, primarily to fill the downtime, the photographing and sharing activities

were main hedonic activities during trips. The informants described their use of smartphones to capture and share photo the important parts of the travel experience. For example, Informant #6 described:

*“I wanted to share it say with my daughters and they weren’t with me and they wanted to see pictures; they’ve never been to Niagara Falls and so I took pictures and sent it to them, emailed it to them and texted. You can text, so I texted the picture.”*

#### 4.1.3 Use of Smartphones for Facilitation for Travel

The informants reported using smartphones to facilitate their activities before and during trips. Before trips, the informants used smartphones to manage their itineraries, check weather, check-in for flights, and purchase tickets for trains, buses, and shows. For example, Informant #1 mentioned usually planning trips during commutes to work, and she used the smartphone to plan her trips and purchase bus tickets.

*“So first I used a bolt bus. So I bought bolt bus ticket by website.....at that time I was in subway to work.” (Informant #1)*

Informant #15 mentioned planning trips during breaks at work, using the smartphone to shop for and buy flight tickets during lunch at café

*“Because I was in the cafeteria and it was a break time for me and that's what I use things in which I cannot do on laptop, but I do it, because in the cafeteria we were like eight people sitting down together. And all the people wanted to come along with us. Not just a trip for two people. It was a trip for eight people..... So all of the people wanted me to check on the smart phone if there are tickets available to they can join me. And I told them that if there aren't any tickets available only me and my wife can go instead of all. But fortunately there were eight available. So they paid me through their little later but they asked me to book the tickets on their behalf. So I went ahead and booked tickets for eight people using my credit card at that point of time.” (Informant #15)*

During trips, the informants used smartphones to track flights, plan and purchase tickets for transportation and shows, and to navigate their tours. Apparently, navigation is one of the most popular uses for smartphones (13 informants mentioned this activity). Tourists

adaptively used smartphone's functions for location awareness and GPS applications (apps). That is, they not only used the navigation apps to find directions, but also used the apps to understand geographic environments for safety. For example, two informants said:

*"In Saint Louis I did because we were – didn't know the place we were renting the car. We didn't know where the heck we were going. So, we used the smartphones a lot in Saint Louis to get from Saint Louis to Columbia, Missouri. Also to find a barbeque restaurant that was a famous TV barbeque joint. We used the phone to find out the name of it and navigation." (Informant #19)*

*"I used Google Maps, map function.....Because the trip was planned for us. So we had very little information about where we were going. So we had, at least one of us – sometimes the girls, we actually had our phones, and so we could tell where we were." (Informant #5)*

#### 4.1.4 Use of Smartphones for Information Search for Travel

Reportedly, the smartphone is an effective and handy tool to search for information regarding transportation, accommodations, dining, things to do during trips, travel ideas, and deals both before and during trips. Before trips, the travelers used smartphones to monitor flight prices, search for deals at destinations, and plan for accommodations. For example, two informants said:

*"When it comes to the phone about the travel, I fly standby a lot, so I use the phone. And the phone is very valuable for the checking in, because I fly standby, so I do check in on my flight with the phone and I do check to see what my chances of making the flight are on my phone as well." (Informant #19)*

*"Sometimes Groupon. I do Groupon and Living Social deals all the time and Google Offers. And they have the getaway stuff. They'll have offers locally." (Informant #7)*

During trips, apparently, using smartphones to identify a restaurant was common among informants (15 informants mentioned this). The descriptions of the specific circumstances of "finding a restaurant" revealed that travelers used smartphones to: 1) find reviews and addresses of known restaurants, and 2) search for dining ideas. For example, travelers sometimes knew the restaurants they wanted, and then used

smartphones to find customer reviews to justify their choices and to find directions.

Informant #8 described:

*"We were deciding on where to go to dinner on our first night there and was wanting to go to a—what's his name, hang on it'll come to me—Coach—I can't remember his—it's a restaurant that's owned by the former Chicago Bear—Ditka's! Mike Ditka's. And I knew it was nearby but I couldn't remember the address and so we looked up the address on the phone and then checked the menu before we went. And then we did go."*

Informant #11 described:

*"We were debating whether to go to a Italian restaurant or Thai restaurant know, Why don't you use your smartphones and check for the location of the restaurant, and we will go there?" So, I did exactly that. And we ended up in a nice Italian restaurant."*

In addition, "finding a restaurant" seems to be spontaneous for travelers. That is, different contextual factors drove travelers to decide or change decisions for dining arrangements, so they used smartphones to search for dining options. For example, Informant #5 mentioned needing to decide on a restaurant because a companion suddenly wanted to meet some friends. They needed to choose a restaurant, which was appropriate for both of them in terms of distance:

*"Okay. Oh, right, and then Chris was thinking about meeting another friend of him, but he just say, "Okay, you know all the restaurant, so let me pick one." So I just check the location, and I know where his friend is coming, like in what area, so I just check one by one, see which one is closest to the place she wants to meet. And I say, "Okay, this one seems very close and not too far from..." Just both of us just travel a little bit, but we can manage it. And the price in the restaurant seems reasonable, and then we were just there, and then maybe I will switch to Yelp and see what kind of food they recommended from Yelp." (Informant #5).*

Informant #22 reported always needing to search for restaurants because of vegetarian preference. Particularly, when overseas, planning was difficult and resorted to smartphone to search for restaurants upon arriving at a destination:

*"the biggest thing for me was trying to find restaurants that I could eat at when I was in Asia 'cause I am a vegetarian so it is kind hard." (Informant #22)*

In addition, the informants reported locating restaurants by using a variety of means including Google search engine (Informant #17), Google Maps (Informant #22), and some other applications such as Yelp (Informant #1), YPmobile (Informant #11), and HappyCow (Informant #22).

The travelers also used smartphones to search for activities to do at destinations or search for hotels if plans changed during trips. For example, Informant #4 mentioned:

*“Oh yeah, definitely. I remember me and my friends went down to the beach last year at Atlantic City. And one of the days we were there it was raining miserable. So I remember looking up on my phone – we found shopping outlets and we found a movie theatre to go to.”*

The use of Twitter during trips appears to be different from its use in everyday life. In everyday lives, people used Twitter as one of sources to acquire news. In the context of travel, travelers tried to follow “tweeted” information associated with visited destinations. As such, Twitter became one of the more important information sources for travelers for planning activities during trips and to obtain local news. For example, two informants mentioned:

*“So they said there is the movie festival at the – Tribeca Movie Festival. So after I saw that, the Tweet message, I checked their website. And I found that Tribeca is not that far from the bolt bus station. So before meeting my friends, ‘cause my friends have to take care of a baby, so at first, I went to Tribeca Movie Festival by myself. So I checked their website, Tribeca website, and I bought a ticket by mobile. And I went to the movie.” (Informant #1).*

*“I used Twitter a little bit to follow the actual – the lodge that we were staying at. They gave us kind of – they would update on their ski conditions and things. And, even though we didn’t actually end up skiing, though, but it was great to see they had the weather updates. They would Tweet them. And, just little events that were going on, and pictures of different events they were having there. So, during that time when we booked the trip I started following them on Twitter. And, then when we were there we were checking it out on our phones.” (Informant #9).*

The above findings regarding the use of smartphones in four aspects are verified by the results from the online survey (i.e. a different data collection method for data

triangulation) (Appendix H). The results of the online survey includes most of the uses of smartphones that were reported by the interviewees, excepting six activities: playing games, surfing on the Internet, checking weather information, purchasing ticket during trips, searching information from twitter, and searching deals prior trips. Also, the results of the online survey verify that phone calls, checking emails, and navigation are important uses of smartphones during trips.

The findings indicate that travelers use smartphones for a variety of activities (i.e. 25 items in Table 7) in the areas of communication, entertainment, facilitation, and information search (both before trips and during trips). Before trips, the smartphones mainly provided travel planning options, such as searching for things to do at destinations, searching for deals for flights, hotels, and attractions, and purchasing tickets for shows. During trips, the smartphones provided important information communication link to help travelers maintain connections with families and friends (communication), occupy down-times (entertainment), facilitate managing itineraries and obtaining directions (facilitation), and accessing information resources when needed (information search). The results suggest that the travelers prefer to take advantage of two features of smartphones: the agglomeration of multiple digital devices and the strong computational capability to connect with the Internet. In travel, besides using the basic functions for communication, the travelers used smartphones to replace many other devices such as MP3 players, GPS devices, Kindle (digital reader), and cameras. As such, travelers indicated that they enjoy travel more by capitalizing on preferences as usual (e.g. listen to music, read books, take photos) while avoiding carrying multiple devices (Informant #5). Also, travelers took advantage of ubiquitous Internet connection to use the smartphones

to facilitate and plan trips. They used smartphones as substitute for desktop or laptop computers to enjoy the information services available on the Internet such as searching, reserving, and other transactions. The investigation of the use of smartphones for travel suggests that contextual factors can substantially influence the functions of smartphones used and travelers' use of these functions. In answering to the probing questions regarding the reasons for using smartphones, informants highlighted motivations for use for different activities originating from specific circumstances. The next section describes the motivations and other factors that lead travelers to use smartphones.

#### **4.2 Research Question 2: The Factors Influencing the Use of Smartphones in Travel**

In the conversations regarding use of smartphones for travel, the informants responded to questioning the reasons that motivated use of smartphones in the context of travel. The factors influencing use of smartphones for travel were identified from two contexts (travel and everyday environment). The factors from the context of travel are direct drivers leading to the use of smartphones, which can be organized into three categories based on the theories regarding the adoption and use of technology (i.e. motivations, cognitive beliefs, and situation and personal facilitators). In addition, the informants reported that the use of smartphones for travel changed their travel experience, including travel activities and interpretations and sensations toward travel. The informants indicated that these changes could influence the use of smartphones in future trips.

The factors from everyday context are indirect factors associated with the use of smartphones for travel. The informants described their use of smartphones in the

everyday context and their changes after the adoptions of smartphones. These changes indicate that the use of smartphones for travel is associated with the use of smartphones in everyday context, because these changes have been integrated into the informants' ways of communication, ways of information consumption and even lifestyle (e.g. new routines or habits). Also, a comparison of uses of smartphones in both contexts echoes that uses of smartphones in everyday experience and the context of travel are associated. Therefore, uses of smartphones in everyday experience are described in this section, considered as a set of factors influencing uses of smartphones for travel.

#### *4.2.1 The Direct Factors Driving the Use of Smartphones for Travel*

Three sets of factors are identified to directly influence the use of smartphones for travel. One set of factors include travelers' extrinsic and intrinsic motivations to achieve some purposes such as to acquire food, to identify a location, to share photos with friends, or to fulfill downtime. Extrinsic motivations represented a variety of information needs such as utility information needs, social information needs, and hedonic information needs (Vogt & Fesenmaier, 1998), which encouraged travelers to use smartphones to satisfy the information needs. The intrinsic motivations generated the perceptions to "perform an activity for the process of performing the activity" (Davis et al. 1992, p. 1112). Such perceptions encouraged travelers to use smartphones to experience "the process of performing the activity". The second set of factors are travelers' cognitive beliefs toward the use of smartphones such as perceived usefulness, perceived ease of use, trust, and social norms (Venkatesh, Morris, Davis, & Davis, 2003). These cognitive beliefs lead travelers to choose smartphones rather than alternatives, to fulfill needs

generated from the extrinsic and intrinsic motivations. The third set of factors refers to situational and personal facilitators that indirectly enhance the travelers’ cognitive beliefs towards smartphones or assist travelers’ capabilities for these devices’ use (Thompson, 1991). These facilitators are no computer (desktop/laptop) access, websites use experience on computer, and prior use experience on the platform of smartphones. Each set of factors are described in details in the following subsections.

*Motivations Driving the Use of Smartphones for Travel*

The results demonstrate that travelers were motivated extrinsically and intrinsically to use smartphones in their trips (Table 8).

**Table 8. Motivations Driving the Use of Smartphones for Travel**

<b>Category</b>	<b>Motivations</b>	<b>No. of Informants</b>	<b>No. of References</b>
Extrinsic Motivation (12 items)	Social Fun	18	32
	KeepConnected/Informed	15	31
	Food	12	16
	KeepSafe	6	10
	PlanTrip	6	11
	Directions	5	6
	Transportation	4	5
	Accommodation	4	4
	Thingstodo	2	3
	BetterValue	2	3
	BeIsolated	2	3
	Shows	1	1
Intrinsic Motivation (2 items)	Habit	11	15
	KillTime	8	13

*Note: Reference refers to the sentences or paragraphs describing the specific motivations.*

Extrinsic motivation refers to “the instrument perceptions towards performing activity to achieve valued outcomes that are distinct from the activity itself such as improved job performance” (Davis et al. 1992, p. 1112). This study identified 12

extrinsic motivations. Seven extrinsic motivations originate from the spontaneous needs encountered during trips, including obtaining food (*Food*), finding directions (*Directions*), arranging transportations (*Transportation*), finding accommodations (*Accommodation*), planning (or replanning) trips (*PlanTrip*), seeking for things to do during trips (*Thingstodo*), and arranging for shows (*Shows*). Among these, it seems that the spontaneous need for food is more common among the informants than other needs (12 out of 24 informants mentioned) because many informants reported to use smartphones to find restaurants.

The descriptions revealed that the travelers had spontaneous information needs due to unexpected conditions, impulsive decisions, and intentionally unplanned itineraries. For example, Informant #6 mentioned not planning to remain overnight in Buffalo, NY, but impulsively decided to extend the trip, requiring the need to find a hotel for one night:

*“Well I don’t book ahead a lot. I just take off and go and when I’m in the car, I just get on Google really quick and find a hotel in the area.” (Informant #6).*

Informant #3 described a spontaneous need for lunch:

*“Yeah. We were going into town and we were wondering, we were getting hungry. It was probably lunchtime. We just went shopping and my cousin goes oh, I know this one restaurant. It was a fish and chip place.” (Informant #3).*

Also, Informant #5 mentioned an inability to plan a departure, so she just bought the bus ticket with her smartphones when she was ready to leave the destination:

*“Yeah. Up until recently, I hear it may be changing, but you didn’t need to buy your ticket. You could buy it 20 minutes before you leave. If I was in the city in New York, I would just hang out with my friends until I was ready to go. On my way to go to the bus I would buy my ticket. And then you show the guy your receipt on your phone and you’re allowed. Two hours later, you’re in Philly.” (Informant #5)*

The other five extrinsic motivations are: 1) seeking for fun from social activities (*SocialFun*), 2) keeping connected with others or keeping informed about the news from another location (e.g. living place, work place) (*KeepConnected/Informed*), 3) ensuring safety (*KeepSafe*), 4) gain better value from trips (*BetterValue*), and 5) being temporarily isolated from travel companions (*BeIsolated*). These extrinsic motivations are more likely to originate from a traveler's personality, lifestyle, or family situations. For example, some informants indicated that they can acquire a sense of satisfaction and happiness from sharing their experiences with others. Some informants mentioned:

*"Yeah. I mean I just thought everyone should know like this is so cool. Look what I'm doing. I'm - like, I was excited for myself that I was there and seeing it again. So I wanted to like share that and maybe make people a little jealous."* (Informant #2).

*"A lot of it's kind of to show people that follow you on Facebook kind of what you're doing. You know, show them exactly what you're doing at the time, and to show them how nice the room was, and maybe get some feedback on it. Sometimes people comment on your pictures and things while you're there. So, it's nice to get some instant feedback."* (Informant #9).

Some informants indicated that they actually enjoyed being in contact with work during travel because they cared about the things happening in the workplace, and they enjoyed their jobs. For example, Informant #20 mentioned:

*"Just to keep up with what's going on because email is the primary way in my workplace that people contact each other, so if something comes up then I hear about it by email and that's what I was trying to keep track of..... I guess for me I like keeping track of that because I really like my work."*

Some informants mentioned that the sense being safe provided motivation for some activities such as navigation, checking flight status, or having a smartphone available all the time. As Informant #14 mentioned:

*"I don't know if you've ever gotten lost, but it is the worst. It makes it easier when you can pull out your phone and it's like, "You are here," and then you can find where it is that you need to get to. I mean, it's really important when you're in a city that's not home to have that map right there."*

Some informants indicated that they desired the best value from expenditures, so before any spending, they compared options to gain the most value. As Informant #24 described:

*“When I left on Saturday morning, I knew I’d need gas either when I got to Maryland or on the way down to Maryland. I was able to check for the gas prices in New Jersey and then check for the gas prices in Maryland and figure out where to go to get the most favorable price on the gas and get directions to that gas station.”*

Finally, some informants identified that being temporarily isolated from travel

companions motivated them to use smartphones. Informant #5 described:

*“Yes. I’ve never been around so many people for so long. [Laughter] It was a lot of fun but every once in a while, yeah, I would just put music in. That was like my quiet time.”*

Two identified intrinsic motivations (i.e. *KillTime and Habit*) caused informants to “perform an activity for no apparent reinforcement other than the process of performing the activity per se” (Davis et al., 1992, p. 1112). Travelers reported using smartphones to pass time by playing games (Informant #4), watching movie (Informant #2), or listening to music (Informant #10). Travelers also admitted to engaging in some activities due to habit. “Habits” mentioned by the informants refers to two practices or tendencies. One is getting used to use a smartphone to do self-entertainment in “downtime”. For example, Informant #4 mentioned:

*“Yeah it’s definitely like a habit and it’s just maybe it’s something that I just kind of naturally feel inclined to do. If I have time that I need to kill, if I have that down time – I mean I do still do other things.”*

Another “habit” is getting used to use a smartphone to search for instant solutions whenever an inquiry or problem arose. As Informant #4 described:

*“I don’t know. I just – it’s just been engrained in me since I’ve got. If I’m wondering anything, like if me and my friends are trying to think of an actor’s name or what this certain movie’s called it’s just so easy. I can hop on my phone; hop on Google and within a few seconds have an answer.”*

### *Cognitive Beliefs Toward the Use of Smartphones for Travel*

Analysis identified four cognitive beliefs associated with the use of smartphones for travel, including convenience/ease of use, usefulness, trust, and social norms (Table 9). Informants illustrated cognitive beliefs toward the functions of smartphones to justify selection of smartphones to perform activities encouraged by extrinsic or intrinsic motivations.

**Table 9. Cognitive Beliefs toward the Use of Smartphones for Travel**

<b>Category</b>	<b>Cognitive Beliefs</b>	<b>No. of Informants</b>	<b>No. of References</b>
Cognitive Beliefs (4 items)	Convenience/Ease of use	21	45
	Usefulness	8	22
	Trust	5	6
	Social norm	4	4

*Note: Reference refers to the sentences or paragraphs describing the specific cognitive beliefs.*

First, the most commonly cited cognitive belief is perceived convenience and ease of use, which refers to the degree to which a person believes that using a smartphone to perform an activity would be free of effort (Davis 1989, p. 320). The perceived convenience and ease of use was usually the first response from the informants when asked for a rationale for using a smartphone (21 out of 24 informants mentioned). As

Informant #1 said:

*“Yeah. I think the most I loved about the iPhone, it’s very intuitive. Just I feel like if I want to do something and if I do something, yeah, it works. Yeah, it works. Yeah. It’s very easy.”*

Some informants highlighted their perceptions of convenience by comparing a smartphone with other devices (e.g. laptop computer):

*“So that’s what I used to do everywhere I go when I leave the office, I would take my laptop with me, it would be on my shoulder. My purse on one shoulder, my laptop bag on the other and I*

would be in the restaurant with me, everywhere I went. And then, when I got that smart phone in November and I realized you can go on the internet from the smart phone, it's another convenience, I don't lug around the laptop as much anymore." (Informant #18)

Second, although informants did not directly comment on the perceived usefulness of smartphones for travel by using terms such as useful or helpful, some descriptions of the use of smartphones indicated the devices' capability to fulfill a variety of needs and helpfulness in the context of travel. For example, Informant #18 described:

*"So the smart phone kept track of everything I had to do and when I was going through the airports, all I had to do was pickup my cell phone and say, okay, now where am I at and where do I have to go? And the itinerary was in the phone, rather than having to scramble for the paper ticket that's always settled at the bottom of my purse so I think the smart phone, it became an easier travel experience because I had that app Trip It.*

Third, Informants identified choosing acquisition of information through smartphones due to trust in the Internet rather than other alternatives (e.g. asking others):

*"It is difficult. People are on the rush. From my experience, I can tell you that you really cannot get reliable, full, detailed information when you are traveling. You can't make your own arrangements, because the information that is available for you at the info booths or info kiosk at the airport is catered mostly to out of the country." (Informant #11).*

*"I mean just reliability. I've used it a good amount of times and I've always been pretty successful. And their directions have been pretty clear." (Informant #3).*

Finally, the informants admitted the influence of others and the culture of their social groups on their use of smartphones for travel. Informant #4 explained one of the reasons sharing experiences with others was due to a generational effect:

*"Yeah, I definitely think it's almost like – I don't know if it's just like a cultural thing because my friends – like my generation I feel like people are always doing that. Like if someone gets a new car the pictures go up right away. If someone goes to a new place the picture's up."*

#### *Situational and Personal Facilitators*

The informants mentioned conditioning factors (i.e. *NoPC*, *PCExperience*, and *PriorUse*), which influenced using smartphones for travel (Table 10).

**Table 10. Facilitators of the Use of Smartphones for Travel**

<b>Category</b>	<b>Faciliators</b>	<b>No. of Informants</b>	<b>No. of References</b>
Situational and personal facilitators (3 items)	No computer access ( <i>NoPC</i> )	4	7
	Use experience on websites ( <i>PCExperience</i> )	4	4
	Prior use experience ( <i>PriorUse</i> )	3	5

*Note: Reference refers to the sentences or paragraphs describing the specific facilitators.*

One of the major reasons for travel planning with a smartphone before trips is lack of access to a desktop or laptop. Some informants used this reason to justify their use of smartphones before trips to check prices for flights (Informant #15), obtain information (Informant #15), purchase bus ticket (Informant #1), and reserve lodging (Informant #21). Apparently, travel planning activities are sporadic emerged from casual conversations with friends, or occurred during “down time” (e.g. taking the subway). For example, Informant #15 described how he came up the idea to travel to Las Vegas and checked flight information:

*“Because our plan was May 11th is my birthday. So it was an instant plan. We wanted – my wife wanted me to be in Vegas for my birthday. So my wife works in the same office, so April 25th or 26th when we signed in the office. So we were simply talking about making a plan. So we were in the cafeteria so I immediately just checked the date of Allegiant Air dates if there were any available tickets.....Because I was in the cafeteria and it was a break time for me and that's what I use things in which I can do on laptop, but I do it, because in the cafeteria we were like eight people sitting down together. And all the people wanted to come along with us. Not just a trip for two people. It was a trip for eight people.”*

Another reason for informants to use some information services such as Google map, Yelp (finding restaurants) on the mobile platform is the experience of using those information services on the desktop or laptop platform. The informants (#1, #2, #8, and #10) commented that they used some information services with smartphones because

they used those services a lot on their desktop or laptop. Also, they either perceived little difference for the information service on both platform (PC V.S. Mobile) or they even perceived more advantages on the mobile platform. For example, Informant #2 commented that she felt that the interface of yelp application on mobile platform is easier to navigate than the yelp website and the quality of pictures of restaurants are better. In addition, the informants associated with the current use of smartphones with their prior use experience either in other trips or in everyday life. For example, Informant #5 mentioned that

*“I have a real Kindle. And I think it prompted me to get this one so that way I can read one book on my Kindle.”*

And Informant #15 mentioned:

*“But when we went to Bronson in the month of February, Groupon gave me a good two good bills for restaurants. They gave me a 20 percent off on a couple of restaurants which we were interested in. So that's when I found out using Groupon what I never used was a deal.”*

The results of the online survey verify that the travelers use smartphones for travel because of the perceptions of convenience or ease of use, usefulness, social norm, and the use experience on computer-based websites (Appendix H). However, the online survey was failed to collect evidence to verify the extrinsic and intrinsic motivations which were reported by the informants. The respondents of the online survey wrote phrases to describe their travel experience. As such, the details of the contexts in which the respondents performed their activities cannot be revealed. The findings regarding motivations are verified in the follow-up interview and the process of member check. The informants who participated in the follow-up interviews and responded for member check

confirmed that their uses of smartphones during trips were triggered by those extrinsic and intrinsic motivations.

In summary, three sets of factors directly drive the use activities of smartphones in travel. The extrinsic and intrinsic motivations encouraged travelers' attempt to use digital and information communication tools to achieve a variety of purposes. The cognitive beliefs towards smartphones and some facilitators such as no access to computer, prior use of information services on computer platform, and prior use of smartphones lead travelers to choose smartphones other than any other alternatives to fulfill their needs. The different kinds of use activities of smartphones are identified be associated with different driving factors depending on the nature of activities (i.e. the purpose of activities). In the next chapter, the relationships between the driving factors and different kinds of use activities of smartphones will be described.

#### *The Use of Smartphones for Travel and The Changes of Travel Experience*

The use of smartphones for travel leads to the changes of travel experience in two aspects (Table 11): changes of travel activities and changes of interpretations and sensations. The first category of changes refers to the changes in travel activities including travel planning, en-route activities, and after-trip activities. In terms of travel planning, many informants (13 out of 24 informants) reported that travel planning is now "easier" than the time before they adopted smartphones (*EasyPlan*). The informants interpreted the meaning of "easy" in two ways. Some of them referred to "less planning". Due to the ubiquitous Internet access, the informants reported that it is unnecessary to plan out everything and prepare all travel information (e.g. directions, phone numbers)

before trips. As such, the travel planning became easy and quick. As Informant #18 mentioned:

*“I would say I worry less, I do less of map gathering, I don’t do that anymore and I don’t worry about the extracurricular stuff like what buses to take and what cabs to take because I make sure I have an app on the phone that I can go into immediately and find out how to get on the cab or I guess I am talking about New York because New York is all about transportation, right? When you get, I used to do, oh wow, I would spend hours going online and printing out bus shuttle schedules and coordinate everything for about a week before I would travel. With the app, if I’m going to be taking the MTA, which is the train, they have the train, up the river, the metro train up the river, the Hudson River. All I have to do, I have an app for that one too. I forgot about to say that one.” (Informant #18)*

**Table 11. Changes of Travel Experience**

<b>Category</b>	<b>Changes</b>	<b>No. of Informants</b>	<b>No. of References</b>
Changes of travel activities (5 items)	Easy planning (EasyPlan)	13	18
	More flexibility during trips (MoreFlexible)	10	15
	More planning before trips (MoreInfoPlan)	3	5
	Less after trip follow up (LessFollowup)	2	2
	Increase trips (MoreTravel)	2	2
Changes of interpretations and sensations (7 items)	More connected with others (MoreConnected)	8	10
	More informative (MoreInformative)	7	8
	Gaining better value of trips (BetterValue)	4	5
	More fun during trips (MoreEntertain)	2	2
	Travel is less stressful (LessStressful)	4	7
	Travel is more secure (MoreSecure)	3	5
	More confident about travel (MoreConfident)	3	4

For some of informants, “*EasyPlan*” referred to the ease of use of smartphone comparing to the use of other alternative ways of planning. Particularly, for most of planning during trips, smartphone provides “the most convenient” solution to search for information to understand geographic environment (Informant #1 and #2), arrange the things to do in the

destinations (Informant #3, #8, and #9), and cope with the unexpected situations (Informant #6 and #17). In addition, Informants (#2 and #21) also reported that they have intentions to travel more (*MoreTravel*) because of all the convenience and flexibility brought by the use of smartphone.

In contrast to less planning, some informants highlighted a different perspective in terms of travel planning which is the increased planning (*MoreInfoPlan*). Some informants (#10 and #14) mentioned that they now tried to do more planning than before because they had the Internet access all the time in both everyday lives and travel contexts. Before the adoption of smartphones, due to the restrictions of desktop computer (e.g. fixed, only for work purpose), they only had limited time to search for information to plan their trips. The adoption of smartphones granted them the ubiquitous access of Internet on another device besides their desktop or laptop computers. As such, they can plan their trips by using their breaks from work, lunch times, and the time commuting to work. Thus, they felt that they did more travel planning than before. Also, Informant #15 mentioned that he tended to become more “picky” for the travel plans, because of the easy access of Internet, he always tried to re-evaluate plans during trips and seek for chances to improve plans based the current situations.

In terms of en-route activities, Informants also perceived that their trips become more flexible (*MoreFlexible*) because smartphones provides them the access to information sources almost anywhere and anytime. With smartphone, travelers can change their plans if the planned activities did not meet their expectation. As Informant #17 mentioned:

*“it’s definitely easier because you know, like say I am in New York City and like we are at a restaurant and the wait is going to be a long time. It’s easier to look up something else close by and where there is not such a wait or whatever, if you are hungry or you know, you want something different or it’s not what you expected it to be.....”.*

In terms of after-trips activities, Informants (#1, #15, and #17) also reported their changes as well (*LessFollowup*). For example, for photo lovers and social media users, before the adoption of smartphone, they would like to upload the photos to the social networks after the trip because there was limited Internet access during the trip. After the adoption of smartphone, they can upload photos during trips.

The second category is about the changes in the interpretations toward trips and sensations. The informants perceived that their trips become more connected (*MoreConnected*). The travelers used smartphones to communicate with others through calls, emails, and social networks during travel. The informants reported that they can keep the routines of communication (e.g. check emails, browse Facebook news feeds) during trips with smartphone. Thus, they felt more connected. For example, Informant #3 compared her recent trips with her trips before she adopted smartphone, she felt that the travel at that time isolated her with her friends:

*“I would say it’s pretty different. I remember when I was little and I’d go over to Ireland with my dad - not little but maybe like 14/15 when I just didn’t even bother bringing my phone over.....Now looking back at it like now, I wouldn’t want to leave the country without my phone because I’ve just become so used to it. To me like I get worried if I didn’t know what’s going on with some people. So it’s definitely a different experience.....I mean I can’t say - I can say that with my phone is probably better. But I can - I don’t think I could live without my phone or whatever. But I mean it was definitely - I think it’s different also because you’re younger. So when you’re younger you don’t have Facebook, you don’t have Twitter.”*

With smartphones, travelers can take good care of the spontaneous information needs during trips (*MoreInformative*). As such, the informants reported that they felt more

informative than previous trips because whenever they wanted to know something, they can get assistance from smartphones. For example, the Informant #8 described that:

*“Sure yeah, it’s been quite amazing—well travelling because before you’d have to call, you know call information perhaps if you wanted to find out about a restaurant, and then call the restaurant. Whereas now you can just look it up online and typically find out the location, the hours, the menu and then you can check Trip Advisor, which I like to do a lot. I like Trip Advisor.”*

With smartphones, travelers can take advantage of last minute deals (*BetterValue*). The Informant #15 mentioned that they did not plan a helicopter trip in the Grand Canyon, but they finally did it because of the push alert from the Groupon which offered a great deal. In addition, the Informants (#15, #19, and #21) reported that they got better monetary value from trips because the smartphone enabled them to take advantage of last minute deals or make instant changes when they were unsatisfied. Finally, smartphones enabled informants to consume the “down time” (e.g. transit time, on the flight) during trips in the same way of consumption in their everyday lives. They reported that their trips become more fun or less boring (*MoreEntertain*) because they could watch movie while waiting for flight or watch Youtube videos when they were not driving.

In addition, the informants reported that they felt less stressful before and during trips (*LessStressful*), more secure during trips (*MoreSecure*), and more confident towards their trips (*MoreConfident*) because of the ubiquitous access to the Internet. Informant #18 described her experience in dealing with the airline changes. Before the adoption of the smartphone, she always worried about the changes of flights such as delay or boarding gate changes because she was afraid that she missed the emails from airlines or the announcement of airlines from the speakers in the airport. She commented that it was really inconvenient to always turn on laptop to check emails. With her smartphone, she

felt less stressful because the push alert from the airline can keep her informative for any changes.

*“.....But when you get to the airport, if there was a change and the airplane was delayed or canceled, you just don't know unless you are going up to the gate and asking what's going on, but now with the smart phone connection, I think it's more convenience is another good word. It's faster to let me know what's changing on my itinerary and the airline trip and it gives you an instant message for the alert change, so I think that's the big relief.”*

Several female informants (#5, #6, and #22) highlighted the sense of secure brought by the smartphone because of its strong connections.

*“If I travel alone, being a female, I have my cell phone; it's just safer. I feel safer. I like to just go and I feel like I have...it's just readily available to you. You can find a hotel quick, you can get around, you can look everything up on the phone to book a hotel and find a restaurant and find local happenings and things that are in the area. I think the word I want to use is safer. I feel safer having my cell phone and having the technology.” (Informant #6).*

The informants (#4 and #9) also felt more confident in that they always can make better decisions during trips with smartphones.

The findings regarding the changes of travel experience after the adoption of smartphones were partially verified by the respondents of the online survey (Appendix H).

The respondents reported that they perceived the changes of travel activities and the changes of some interpretations toward trips. For example, similarly, the respondents reported that the travel planning now becomes easier because they can do less planning before trips. One respondent enriched the concept of “easy planning” by reporting that her travel planning can be broken down into small pieces and completed within some downtimes. The respondents also reported that they felt more connected with their families and friends and more informative about the destinations and attractions.

In summary, the use of smartphones has changed travel experience. On the one hand, the use of smartphone unlocks the three-stage model of travel experience (pre-

consumption, consumption, and after-consumption). With smartphones, travelers can postpone the timing of decision-making on restaurants, local transportation, and things to do from the pre-consumption stage to the consumption stage. Smartphones also enable travelers to share their experience en-route through posting pictures on the social network websites or texting with family and friends to update travel status, comparing to the practice of sharing experience after trips before the adoption of smartphone. On the other hand, the use of smartphones connected the contexts of everyday lives and travel. During trips, travelers' were kept connected with the contacts in their everyday lives through the ways of communication that they preferred as usual. Thus, travelers felt more connected, less stressful, and more secure because they always could get support from family and friends and never feel being isolated. In addition, the constant connection with the information sources that travelers used in their everyday context enabled travelers to be flexible by taking advantage of online planning even when they are en-route. Thus, travelers become more confident on their trips and believe that they can get better monetary value from trips.

The changes in travel experience due to the use of smartphones suggest a feedback loop to encourage the use of smartphones in future trips. For example, the travelers tend to make fewer plans for travel because they know that they can get to information sources anytime and anywhere. As such, more spontaneous needs (i.e. extrinsic motivations) may arise in travel to motivate travelers to use smartphone to help decision making.

#### 4.2.2 *The Indirect Factors Driving the Use of Smartphones for Travel: The Use of Smartphones in Everyday Experience and Changes in Everyday Context*

The informants reported their use of smartphones in their everyday experience as well as the changes brought to them with such use. These descriptions indicate that the use of smartphones in everyday context indirectly influence the use of smartphones for travel by changing travelers in their ways of communication, ways of information consumption, and even lifestyle. This section introduces the use of smartphones in everyday context and the changes reported by the informants.

##### *The Use of Smartphones in Everyday Context*

Informants reported a total twenty-one unique use activities of smartphones in everyday context, and these activities can be organized into four categories based on the purpose of use (Table 12). First, the smartphones is used as a communication tool to keep connected with others. However, comparing to the “old” mobile phones (Feature phones), the smartphones enables informants to communicate in a variety ways other than only calls. The informants reported to contact with others not only by calls, but also text messages, emails, and social networks (e.g. Facebook). Also, the informants’ descriptions revealed that it has become a routine for most of informants (16 out of 24 informants) to use smartphones to check emails, text messages, and social networks after wake-up and before go to work. That is, a smartphones is usually the first ICT tool people use every morning.

**Table 12. The Use of Smartphones in Everyday Context**

Category	The use of smartphones in everyday context	No. of Informants	No. of References
Communication	Send/Receive emails ( <i>D_Email</i> )	16	24

(4 items)	Send/Receive text msg ( <i>D_TextMsg</i> )	15	23
	Login facebook ( <i>D_facebook</i> )	15	29
	Phone calls ( <i>D_Calls</i> )	9	12
Entertainment (7 items)	Read news ( <i>D_News</i> )	16	25
	Play games ( <i>D_PlayGame</i> )	10	13
	Listen to music ( <i>D_Music</i> )	8	13
	Read news on twitter ( <i>D_Twitter</i> )	6	9
	Take and share photos ( <i>D_Photo</i> )	6	11
	Watch movie ( <i>D_Movie</i> )	2	4
	Read book ( <i>D_Book</i> )	1	1
Facilitation (6 items)	Navigation ( <i>D_Navigation</i> )	10	13
	Check weather info ( <i>D_Weather</i> )	7	7
	Use as alarm ( <i>D_Alarm</i> )	6	7
	Daily schedule ( <i>D_CalendarPlanner</i> )	6	8
	Manage bank accounts ( <i>D_Bank</i> )	5	13
	Manage stock ( <i>D_Stock</i> )	4	4
InfoSearch (4 items)	Record & Price comparison ( <i>D_Shopping</i> )	8	12
	Search for restaurants ( <i>D_Rest.</i> )	7	11
	General info. search ( <i>D_GenInfosearch</i> )	7	7
	Search for travel deals/ideas ( <i>D_TravelIdeas</i> )	3	8

*Note: Reference refers to the sentences or paragraphs describing the use of smartphones in everyday context*

Second, smartphones were used as entertainment tools to browse news from websites, news apps and twitter, play games, listen to music, watch movies, read books and take photos. These uses of smartphones for self-entertaining purpose were reported to happen during downtimes such as the period of commuting to work (Informant #20), the waiting times (Informant #12), the breaks from work (Informant #17), as well as the quiet time before falling asleep (Informant #5). For example, Informant #3 reported that:

*“Yeah. I mean that’s like I said, like the Google or something. But I use that for like just if I’m bored and I don’t have anything else to do, just to go on my phone and just check out - like see what’s going on. Because sometimes they have like newsfeeds or something of stuff that’s happening, like current news. So sometimes I just look at that to just pass the time.*

Informant #5 also reported that:

*“And then I listen to NPR because I’m away. So, I listen to WHYY. I’m getting the Philadelphia News while I’m getting dressed. And then I walk to school with NPR playing.”*

Some Informants (Informants #1, #4, #10, #11, #16, and #24) reported that it became their hobby to use smartphones to take photos to record the interesting moments and things in their lives and share with others.

*“Yeah. So when I see my friends’ response, I think sometimes it’s much more interesting than just enjoy it by myself. Or sometimes if I go to some restaurant or some café or some new place by myself, sometimes I feel lonely. But at the moment, I could upload some photo or I could send some message to my friends. And, you know, my friends send some feedback. And I think it makes me much more happier.”(Informant #2).*

Third, smartphones become good “personal assistant” (Informant #7) or “friend” (Informant #9, #22). The informants reported that smartphones facilitate them in many ways, including guiding directions (Navigation), monitoring weather (Weather), waking them up (Alarm), organize everyday activities (Calendar/Planner), managing bank account (Bank), and managing stock deals (Stock). For example, the informants mentioned:

*“well, when I get up in the morning, I usually check my calendar first to see what I had planned for the day..... And then, my calendar, I have a personal alarm that would go off so that if I have a special appointment, that would remind me of what to do.” (Informant #18).*

*“And I just GPS the address rather than ask them for directions. It makes it easier for me. It works well. I like my GPS. At home, I’ll be with my phone. I use it all the time because it’s like having a secretary. It talks.” (Informant #7).*

Finally, smartphones also served as important information search tools in informants’ everyday experience. The informants used smartphones to help decision making when they were shopping, to search for information whenever they wanted to know something, to look for restaurants with different apps (e.g. Yelp, Urbanspoon), and to collect travel ideas. For example, Informant #12 reported to take photo of products for the prices comparison reason:

*“--while we’re shop—take a photo of what we’re shopping for, and I store the photo. And then if I want to go back later on, say to another store, and I can check the price and what exactly what that was of that one and I’ll be able to use it in that way.” (Informant #12)*

Informant #10 reported that whenever he had some free time from work, he usually checked some online travel agencies such as Priceline, Expedia to keep an eye on the recent travel deals.

*“Well, I don’t really plan it. I mean, I’m just researching and trying to get pricing and stuff, and what dates.” (Informant #10)*

The above findings about the use of smartphones in everyday life are verified by the respondents of the online survey (Appendix H). The respondents reported that the uses of smartphones for processing emails and text messages, checking Facebook, and making phone calls are major communication activities in their everyday lives. The majority of respondents also reported the uses of smartphones for reading news, play games, navigation, managing everyday schedules, and searching for information.

In summary, with the advantages of ubiquitous Internet access, agglomeration of multiple digital devices, and portability, besides a communication tool, a smartphone also is an information search tool, entertainment tool, and facilitator in people’s everyday experience. The informants use their smartphones from the time after they wake-up to the time before they close their eyes for communication, entertainment, facilitation, and information search.

### *The Changes in Everyday Context After the Adoption of Smartphones*

Smartphones, a revolutionary innovation of mobile technology, are different from the “old” mobile phones in terms of functions, connection capability, and computation capability. These differences lead to a different use of smartphones in people’s everyday

experience. The informants reported eight changes caused by the adoption and use of smartphones in everyday context (Table 13). This section describes each change in the following subsections.

**Table 13. Changes in Everyday Context Due to the Use of Smartphones**

Category	Changes	No. of Informants	No. of References
EverydayChanges (7 items)	Extension/ReplaceICTTools	14	29
	NewBehavior	11	16
	MoreConnected_Life	10	13
	InfoAccessTool	8	13
	Routines/Habits	3	4
	UseOfDownTime	3	3
	TechSavvy	2	2

*Note: Reference refers to the sentences or paragraphs describing the changes in everyday experience*

*The use of smartphones as an extension or replacement of other tools  
(Extension/ReplaceICTTools)*

The predominant change that the informants perceived is that smartphones is an extension of desktop or laptop in terms of the use of Internet connection. As the informant #11 mentioned:

*“when I am in my office – like we are right now, talking – my smartphones is basically sitting on my desk, and I use my desktop. But [break in audio] when I go out to a meeting, I carry my smartphones with me, and I check any e-mails and phone calls coming to my cell phone. So, it's an extension of my communication tool.”*

Due to the ubiquitous Internet access provided by smartphones, the informants used smartphones to perform many tasks which were performed only on the platform of desktop or laptop. The informants mainly referred to check emails (e.g. Informants #13, #15), check news (e.g. Informants #10, #11), and information search (e.g. Informant #15). Such use of smartphones led to two outcomes. One is the decrease of the use of

desktop or laptop to perform the aforementioned tasks. For example, Informant #15 mentioned in both first and follow-up interviews that he moved many tasks that were completed by using his desktop or laptop to the smartphones platform. And the things he did with his smartphones were increasing in recent years.

*“When the phone, which was not a smartphones, my regular phone, the only thing I used to do is all up people and know what’s going on with them or either text message. After that there was absolutely nothing I was using my phone for. But right now, I have converted my uses of many things which I do on a laptop, at least to 20 to 30 percent onto my smartphones. Which I can do on the go now, which I was never able to do before.”*

*“You see when I started using my smartphones, my first smartphones, I only used to do 10 to 15 percent of my things on smartphones and only when I did not have access to my laptop. Right? Things went on and after four years with the smartphones now, even if I’ m having access with my laptop, I’m so used to the keypad and the quick functions which I can do on my smartphones. I guess 30 to 40 percent of things I’m doing on my smartphones, even though I have access to my laptop. So that’s a big change in my behavior.”*

Another outcome is the increase of the activities such as checking emails, news, and Facebook after the adoption of smartphones. Informants reported that the frequencies of these activities were increased due to the use of smartphones because of its ubiquitous Internet connection. For example:

*“Smartphones, to a certain degree, enlarged my presence—of my time reading the news”  
(Informant #11)*

*“I’m probably on Facebook at least four to five times a day, throughout the day, if not more, if not more. But, yes, that has definitely increased my usage since I’ve had the Smartphones.”  
(Informant #22).*

In addition, the informants perceived that the multi-functional smartphones can replace many other digital tools. For example, the everyday uses such as listen to music, navigation, and take photo were completed separately with mp3 player, GPS, and camera before the adoption of smartphones. With smartphones, the informants completed these tasks on only one device. The portability and ease of use of smartphones are main reasons

motivated the informants to substitute the original devices with smartphones. Informant #7 mentioned that

*“it makes it easier for me. It works well. I like my GPS.”*

Informant #11 illustrated that he almost completely discarded his camera:

*“...I have a Nikon—it weighs like two-two and a half pounds—and is quite big to carry, you know? You can’t put it in your pocket. ... Now with the smartphones I acquired from HTC the resolution of the camera is 8 mega pixels which is equal to DSLR camera. The quality of pictures is almost identical to the quality of pictures you take using DSLR camera. Say almost because the settings are a little less sophisticated but, you know, it’s still an 8 megabyte camera. So, the smartphones pretty much reduced my time of using the regular camera by at least 50%. I take many, many more pictures using smartphones than used to be phone. Now I take as many pictures using smartphones as my regular camera.”*

#### *New behaviors from the use of smartphones (NewBehavior)*

The use of smartphones encouraged new behaviors. Seven new behaviors were identified from nine informants who mentioned that they developed some new behaviors after the adoption of smartphones. First, the built-in camera of smartphones encouraged the informants to use photo as a way to record their lives. For example, Informant #18 described that she began to use her smartphones to record her life at a regular basis:

*“One day I had a workman come over to my house to do some work on the building, the outside of the building. So before he came, I took picture and then I go hey, I got video.... And then when he got done building the project, then I did the before and after.... So I feel that in my everyday life, that’s just one idea for maintenance to document it. But on a friend/family thing wherever I go now if it’s for a fun event they say, “Hey, take pictures of that festival and then text me the picture or email them.” So I’m doing that like on a weekly basis if I’m doing something on an entertainment level like...”*

Second, smartphones changed the way of information search for shopping.

Informant #12 reported that he was now more likely to compare the goods’ prices because he can scan the barcodes and search online immediately. Informants #2 and #6

reported that they took photo for goods as a record and send to others to search for advices.

*“I can be shopping for my grandchildren and take a picture of what I’m looking at and send it to their mother and say, “Hey, is this what they want?... I just take a picture and if she’s at work and I don’t want to call her to bother her, I just text it to her and “Yeah, that’s what they want.” (Informant #6).*

Third, the informant #7 reported that she used apps to help her job. The informant #7 is a jewelry designer, and she appreciated that the smartphones brought so many apps to help her design jobs. She commented:

*“Being an artist, it’s a great tool for artistic experimentation. There’s a site that I go to all the time called Color Lovers. It’s a very interested color oriented creation site. I’m always making things. It gives me an opportunity to just be whatever I am and do whatever I want to do, as far as that goes.”*

Fourth, Informant #9 reported that she adopted twitter as a new information source because of smartphones. She commented:

*“it’s probably because of the smartphones in that—well, actually I—yeah, especially with like Twitter, it’s more designed for a smartphones. It’s really easy to use with a smartphones. So that definitely increased my Twitter usage and I was—I mean it’s just so easy. It’s a few clicks instead of logging in and doing all this other stuff on the computer.”*

Fifth, the informants began to use other ways to communicate with people such as text message. Informant #18 reported that she found that more and more people texted her rather than calling her, so she had to text back. With her smartphone, she got used to use text message to communicate with people. Sixth, Informant #22 reported that she began to use smartphone calendar to organize her everyday schedules, because the calendar on the smartphones has alert function. Finally, Informant #9 reported that she began to listen to music in her free time recently because of the free music provider’s app “Pandora”.

*The increase of connections with others (MoreConnected Life)*

The informants reported that they felt more connected with their family, friends and “external world” because the smartphones provide ubiquitous connection of the Internet and a variety of ways of communication besides calling. As such, they got more chances to communicate with others through different channels such as social networks, free text message software. For example, Informant #6 mentioned that she increased her frequency to use Facebook because of the convenience brought by smartphones; as a result, she reconnected with many people:

*“about putting pictures on websites and stuff, like on Facebook of my grandkids or things like that and even like being on the phone and getting on Facebook, I’ve met high school friends that I haven’t seen for 30 years now So I’ve reconnected with a lot of people.”*

Informant #15 also commented similarly:

*“I want to make it more better. Because with my smartphones, I’m able to connect to more of my school friends, which I was missing earlier. When they send a message, I am able to respond to them immediately. But earlier it was not possible for me.”*

Also, Informant #12 mentioned that he is grateful for the design of smartphones because this brought the convenience to do text message. As a result, he is able to connect with his children more than before:

*“So that is something I will do during day. I have one daughter who has a job where she’s on the phone a lot and when I get ahold of her I just text her and tell her to call me if I want to talk to her on the phone ‘cause it appears to be the easiest way for me to get ahold of the kids. All my children are very busy people and so that’s how it’s that way.”*

Although most of informants were positive towards the increase of connections brought by the use of smartphones, one of them (Informant #11) did not enjoy so much:

*“Well, of course. The response time between receiving an email and replying to an email has been cut down to an absolute minimum. It is a double edged sword because I don’t have any*

*privacy...People can reach me 24/7 which is a great thing but at the same time, you know, I am under constant pressure from outside sources because people know they can reach me on weekends, on holidays, on Saturday, anytime, nighttime.”*

#### *The increased use of smartphones as an information access tool (InfoAccessTool)*

Informants (e.g. #11, #15, and 18) reported that they increased their use of smartphones to access online information sources. Portability and ease of use are two reasons that encourage the informants to do so. Informant #11 commented that his smartphone is an extension of his desktop, so he could rely on it as the only information source.

*“When I am at work, at home, my desktop is my primary source of information. When I am traveling, the smartphones takes over. It becomes the only source of information.”*

Informant #18 also commented similarly:

*“Airplane trip, I’m not next to the information because it’s hard to always going to your lap top to find information, so with the smart phone since it’s right there in my purse, you hit the screen for an app and then it will go in there and find out through real time what’s happened at the location that I’m at. So it really is such a convenience. I’m so grateful for modern technology.”*

Informant #15 reported that after the adoption of smartphones, he reduced his search of information on the desktop computer, because he searched a lot when he was “outside” (e.g. in the car) and his information needs were satisfied instantly.

#### *The development of new routines or habits (Routines/Habits)*

The informants also indicated that they developed some new routines or even some habits (i.e. the actions happened without rationale) such as regularly checking emails, taking photos and sharing with others immediately, regularly checking Facebook, and information search. For example, Informant #11 reported that he got used to check

emails every 15 to 20 minutes. Informant #2 also reported that she checked her email every half an hour. For Informant #2, checking email at a regular basis almost became a habit for her. She commented that:

*“Say for example, like e-mail, right? I just check it. Every time I operate my iPhone, I have to check e-mail..... And then sometimes I don't have anything to check.”*

Informant #15 reported that he got used to share photo on Facebook. Informant #13 also reported that she got used to share photo with others most of the time after she took it in her everyday life.

*“I share just about all of my pictures, especially if we're like going away or something like that. I share just about all my pictures with my friends.”*

Informant #22 mentioned that she became so dependent on the smartphones for decision-making. She felt that she needed to search information whenever she wanted to make a decision after the adoption of the smartphones, but before she sometimes just made decisions based on her intuition.

*“The only thing I would have to say is because I've become so dependent on the Smartphones to do a lot of the deciding for me. I feel like that if this sort of technology were to disappear, it's like, "What now? Do I go back to what I was doing before?”*

#### *The use of “down time” and more “technology savvy” (UseOfDownTime and TechSavvy)*

The informants also indicated that the use of smartphones changed the ways to use “downtimes” such as the breaks from work, the time in commute to work, waiting in the line. The informants reported that they used smartphones to do a variety of things in down times, such as playing games (#15), searching for travel ideas (#10), watching movies (#2, #12). Informant #2 observed that people in the subway were all using smartphones to do something:

*“I remember one time in the subway, in the train, and then almost everybody's using iPhone, so nobody's looking at each other. They just pretend they are busy even though they're probably not; they are just playing a game. And then sometimes I don't have anything to check. Like, I read all the e-mails, I read all the blogs, and I know what's the deals today. I know what's going on in Yelp. But I still just play with it and pretend that I'm busy.”*

In addition, the informants (#6 and #8) reported that they become more “tech savvy” after the adoption and use of smartphones. The informant #6 mentioned that she felt she understood technology better, and she became to be addicted to her smartphone. She felt that there should be apps for everything, and she has to keep learning about them.

The respondents of the online survey provided evidence for the findings regarding the impact of smartphones on people’s lives (Appendix H). The respondents emphasized that smartphones became the extension of their desktops when they were in moving, and smartphones replaced some of their devices such as GPS or camera. Another important change that was reported by the respondents is that smartphones are effective information access tool. The respondents reported their reliance on the smartphones to acquire instant answers for their inquiries. In addition, the respondents reported a new change about the learning of smartphone apps. Some respondents reported that they became active in learning about the new apps for smartphones from TV, newspaper, friends, and other sources, because they have been benefited from the adoption of other apps.

In summary, as listed in Table 13, the informants reported seven changes that smartphones brought to their everyday experience, including 1) the use of smartphones as an extension or replacement of other tools (*Extension/ReplaceICTTools*), 2) new behaviors from the use of smartphones (*NewBehavior*), 3) the increase of connections with others (*MoreConnected\_Life*), 4) the increased use of smartphones as an information access tool (*InfoAccessTool*), 5) the development of new routines or habits

(*Routines/Habits*), 6) the use of “downtime” (*UseOfDownTime*) and 7) more “technology savvy” (*TechSavvy*). The adoption of smartphones changed the way of use mobile technology, the way of consuming information, and the way of communication with others. These changes indicate that the use of smartphones in everyday context may influence the use activities in travel, because these changes can be carried to the context of travel.

#### *The Comparison of the Uses of Smartphones in Everyday Experience and Travel*

The comparison of the uses of smartphones in the context of everyday experience and travel reveals the similarity and differences in the use of smartphones in both contexts (Table 14). The four dimensions of uses emerged from each context (i.e. Communication, Entertainment, Facilitation, and Information search) are exactly same. The specific items in each dimension configure the features or functions of smartphones that the informants used. For communication, the informants reported the use of same four functions (i.e. calls, email, textmsg, and facebook) in both contexts. For entertainment, informants’ use of smartphones are same in terms of six functions (i.e. photo, music, game, book, news, and movie). For facilitation, the informants reported the same use in terms of navigation, checking weather information, and use calendar or notes function to organize life or trips. For the information search dimension, the informants reported to use smartphones to find restaurants in both contexts.

The use of smartphones in the contexts of everyday experience and travel are different in the use of some functions of smartphones. For example, the difference in the entertainment dimension is that informants reported to use twitter in everyday context to

browse news and follow celebrities. However, the use of twitter in travel context is for searching for things to do in the destinations. Also, the informants reported to surf on the Internet to kill time in travel but no report on such kind of use in everyday context. However, in everyday context, informants reported the use of smartphones as an alarm for wake-up and a bank account/ stock deals management tool. In travel context, these activities (i.e. alarm, bank, and stock) are not reported, but several other activities (i.e. track flight, purchase ticket during and before the trips) are reported. Finally, in terms of information search, informants reported to use smartphones to search for different information depending on the specific information needs.

In addition, the use of smartphones in the contexts of everyday experience and travel are also different even for the functions or information services that were reported in both contexts. As shown in Table 14, for example, the numbers of informants reported the uses of emails (16 v.s. 8), text message (15 v.s. 5), Facebook (15 v.s. 4), and playing games (10 v.s. 2) in everyday context are more than the informants reported these uses in the context of travel. The number of informants reported the use of taking and sharing photos in the context of travel (18 v.s. 6) is much more than the informants reported such use in the context of everyday experience.

The comparison of the uses of smartphones in the context of everyday experience and travel indicate that travelers use similar functions of smartphones though sometimes the same function was used for different purposes. As 18 out 24 informants commented that their uses of smartphones in the contexts of everyday experience and travel were “*pretty much the same*”. However, the comparison of the uses of smartphones in both contexts indicates the different pattern of uses of smartphones. For example, for some

activities such checking emails, playing games, people tended to do more in everyday context than they do in trips, whereas people tended to do more photography in trips than they do in everyday context. As Informant #14 mentioned:

*“It’s different in the sense that it’s a grander scale because now you’re talking about looking at hotel rooms and things like that and the information you’re searching when you’re on a trip is relevant to your trip, like you’re trying to find things to do where as opposed to my daily life when I’m using my cell phone it’s more toward entertaining me, keeping busy, and communicating.”*

In summary, the uses of smartphones for travel are influenced directly by the factors from the context of travel (i.e. motivations, cognitive beliefs, and situational and personal facilitators). Also, the use of smartphones in everyday context and the changes brought to everyday experience indicate the indirect influence on the uses of smartphones in the context of travel. In the next section, the interactive relationships of these factors are described to illustrate the mechanisms shaping the use of smartphones for travel.

**Table 14 Comparison of Use of Smartphones in Everyday Context and the Context of Travel**

<b>Category</b>	<b>Everyday Use (No. of Informants)</b>	<b>Travel Use (No. of Informants)</b>
Communication	D_Calls (9)	T_Calls (9)
	D_Email (16)	T_Email (8)
	D_TextMsg (15)	T_TextMsg (5)
	D_Facebook (15)	T_Facebook (4)
Entertainment	D_Photo (6)	T_Photo (18)
	D_Music (8)	T_Music (3)
	D_Game (10)	T_Game (2)
	D_Book (1)	T_Book (1)
	D_News (16)	T_News (1)
	D_Movie (2)	T_Movie (1)
	D_Twitter (6)	T_InternetSurf (1)
Facilitation	D_Navigation (10)	T_Navigation_d (13)
	D_Weather (7)	T_Weather (5)
	D_CalendarPlanner (6)	T_ItineraryMgt (4)

	D_Alarm (6)	
	D_Bank (5)	
	D_Stock (4)	
		T_FlighttrackCheckin (3)
		T_TktPurchase_p (2)
		T_TktPurchase_d (2)
InfoSearch	D_Restaurant (7)	T_Restaurant (15)
	D_Shopping (8)	
	D_GenInfoSearch (7)	
	D_TravelIdeas (3)	
		T_Thingstodo (7)
		T_Flight_p (4)
		T_Hotel_d (4)
		T_Twitter (3)
		T_Deal_d (3)
		T_Hotel_p (2)
		T_Deal_p (1)

### 4.3 Research Question 3: The Mechanisms Shaping the Use of Smartphones for Travel

The previous sections describe the factors influencing the use of smartphones in travel. These factors originate from both contexts of everyday experience and travel. This section integrates all the factors and presents a holistic view of the mechanisms shaping the use of smartphones for travel. The mechanisms consist of seven parts (i.e. the use of smartphones in everyday context, the changes in everyday experience, the use of smartphones for travel, the motivations of the use of smartphones for travel, cognitive beliefs toward smartphones, situational and personal facilitators, and the changes of travel experience) and three sub-processes. The seven parts have been introduced in the previous sections. This section first introduces three sub-processes including 1) the changes in everyday experience and the influence on the use of smartphones for travel (*EverydayChanges —TravelSmartphonesUse*), 2) the changes in everyday experience and

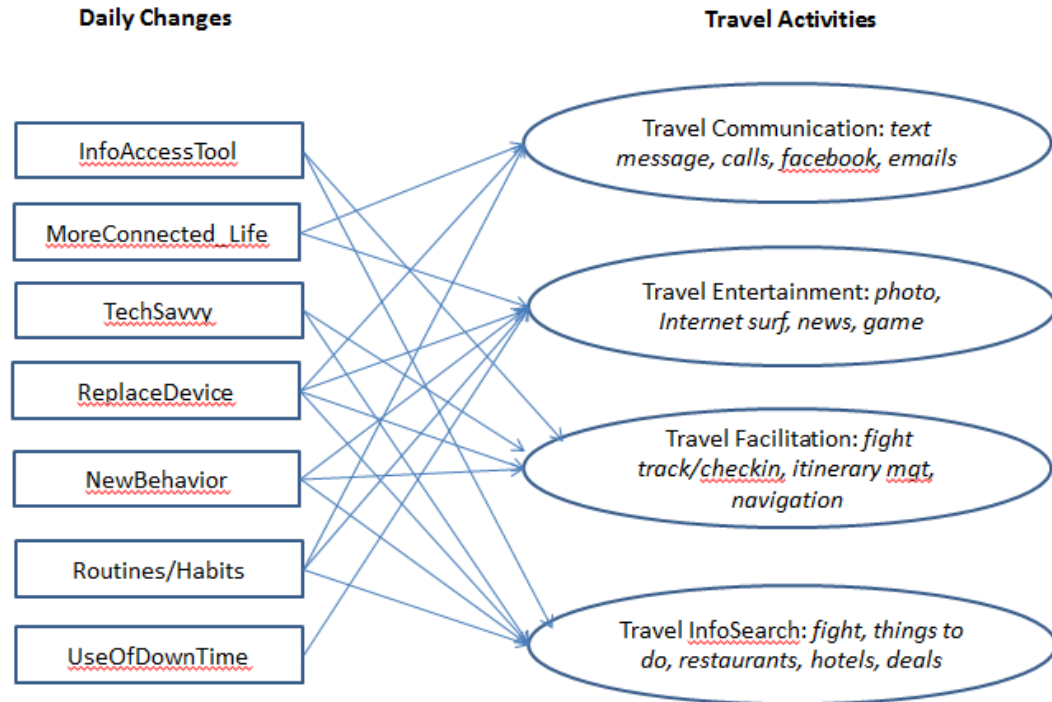
the extrinsic motivations in travel (*EverydayChanges —ExtrinsicMotivations*), and 3) the changes in everyday experience and the intrinsic motivations in travel (*EverydayChanges —IntrinsicMotivation*). This section then describes the mechanisms shaping the use of smartphones for travel.

#### *4.3.1 Changes in Everyday Experience and Their Impact on the Use of Smartphones for Travel*

This section reports how the changes in everyday experience influenced the use of smartphones for travel. This sub-process is identified from the analysis of inexplicit relationships among the identified factors. Specifically, informants listed some uses of smartphones in everyday context to justify the perceived changes they reported (e.g. check emails in every morning, update Facebook status on the train to work). Then informants reported the similar use of smartphones in the context of travel (e.g. check emails during trips, update Facebook status during trips). As such, this study argues that the experience of informants in the context of travel verified the impact of the changes in everyday experience on the use of smartphones for travel.

The follow up interviews confirmed this argument because the informants provided more examples in the context of travel to support the perceived changes they reported.

Figure 7 presents the associations between the changes in everyday context and each kind of uses of smartphones for travel.



**Figure 7. The Influence of Changes in Everyday Context on the Use of Smartphones for Travel**

First, the increased use of smartphones as information access tools (*InfoAccessTool*) is associated with the use of smartphones for travel facilitation and information search. For example, Informant #11 indicated that he increased the use of his smartphone as an information access tool, because the smartphones is the extension of desktop computer to access online information. Then in the conversation regarding his travel experience, he mentioned he used smartphones to check flight information which he would not be able to do without smartphones.

*“So, using my cell phone, I can check on travel – plane – I mean, travel details. I can check online whether the plane is going to depart on time; whether there are any issues with the airline. Before, I didn't have that ability.”(Informant #11)*

The influence of this change (i.e. *InfoAccessTool*) is also reflected in the informants' information search in travel. The informants indicated that the information search for flight, things to do, restaurants, hotels, deals were associated with their perceptions towards the information providing capability of smartphones. For example, Informant #18 mentioned that she appreciated that the smartphones is "*small enough that I can just pick it up and open the screen and push on an app and be able to get the information very quickly.*" Further, in her trip, she used the smartphones to search for hotels when she needed accommodation during her trip to New York City. In the follow-up interview with her, she confirmed that she now was tended to plan out her trip while she was in the destination because she thought that it was very convenient to use smartphones to find information. For example, she mentioned:

*"Oh, another convenient one was when I rented a car in New York the last trip I took. I wanted to know where there's a better place to rent a car because at the airport, oh wow, New York has this luxury tax on renting vehicles. So I Googled it to find out where is an off destination. I think they called it off-site car rental company."* (Informant #18).

Second, the increased connections with others (*MoreConnected\_Life*) encouraged informants' use of smartphones for communication and entertainment (i.e. sharing photo) in travel. For example, Informant #11 mentioned that the smartphones made him approachable by others anytime and anywhere through emails, calls, and text messages, even though he did not like it but he got used to respond to other immediately. In his trips, he mentioned that he kept checking emails because he worried that if people at workplace needed him. In the follow up interview, Informant #11 confirmed that:

*"I don't have control over emails coming to my account, you know? When they come and I open my emails I am instant receipt of information. You know, I have to make a decision whether to consider it an urgent matter or it can wait, but I am constantly under pressure because the*

*information keeps coming and I really don't have any way to turn it off. It is coming whether you like it or not, you know. That is the way it works."*

Informant #15 reported that he felt more connected with his friends because he increased his use of Facebook after the adoption of smartphones. Then, he reported that in his trip to Las Vegas, he shared lots of pictures in the Internet because this is a way to keep communication with his friends. In the follow up interview, he confirmed that:

*"Last time when I was posting pictures I got a lot of likes from my sister. And many of the friends have also seen those pictures. And they said, dude, have a good time. That's your birthday. People log onto their Facebook to wish me on my birthday. And they also liked all the photos, which I posted during the trip. I'm really enjoying the whole piece."(Informant #15)*

Third, some informants (#6, #7, and #18) reported that they become more technology savvy (*TechSavvy*) or understand technology better after the adoption and use of smartphones. As such, they intended to learn about news applications from friends, website, and magazine. Then, they reported that some of smartphones applications they used in trips were from the learning process. For example, Informant #18 confirmed this kind of association in the follow up interview by describing her transition process (i.e. from a technology dinosaur to be good at using smartphones):

*"It was a slow transition at the beginning. I got the phone in November and I was a little bit afraid. How secure is it? I don't know how that goes. Well, since the last time I talked to you, I put on an antivirus application on the phone as an extra precaution, and then I started reading up on different, let's see, methods on how you access the application and how you can use it effectively. I went and got one of those application magazines. It's like an instruction magazine on traveling, and it showed from the very beginning like from the last time I talked to you even, I went inside there and I said let me read a little bit more of it because maybe I need to know how to use it faster. So actually, everything that I did before I talked to you with TripIt to organize travel, the magazine gave you a flowchart like from one to five and how as a beginner how you can go to application, how you pull up the travel itinerary and shows you how to pull up the section, how to do the map. So I went and learned more because prior to that I relied on friends and family to open up my application and kind of show me, but I'm a little older person. I'm more of a visual and I like to see the instructions."*

Fourth, the informants reported that they used smartphones as an extension or replacement of other tools (*Extension/ReplaceICTTools*) in their everyday lives. For example, the informants (#13, #15, and #22), reported the use of smartphones as an extension of the desktop or laptop to do information search for restaurants and deals. Then they reported similar use of smartphones for travel. The Informant #22 reported to use a smartphone app “HappyCow” to search for restaurants in her everyday life because she is vegetarian. She relied on the “HappyCow” to search for restaurants when she was in Korea. Also, the informants (#10, #11, #13, and #22) reported to use smartphones to replace camera and GPS. They reported the use of smartphones to do the same things in travel.

Fifth, the informants reported that after the adoption of smartphones they initiated some new behavior (*NewBehavior*) which they would not do before such as taking photos regularly (#6, #12), using calendar to organize everyday schedules (#18), monitoring deals (#12), and adopting twitter as an information source (#9). Then they reported that they carried these new behaviors into their trips to help them whenever the tasks were relevant.

Sixth, the informants also reported that they developed some routines or habits (*Routines/Habits*) with the use of smartphones such as checking emails regularly, taking photos to record anything interesting and sharing with others. The some informants (Informants #11, #13, #18, #22) also reported the similar use in their trips.

Finally, the informants (#2, #3, #10, #12, #15, and #21) reported that they always used their smartphones to fill their down times (*UseofDownTime*) by watching movie,

surfing on Internet, playing games, or listening to music. Some of these informants (#10, #12, and #15) mentioned that they used the similar ways to fill down time in their trips.

In summary, the changes brought by smartphones to informants' everyday experience influenced different uses of smartphones for travel. The results suggest that the use of smartphones in everyday context can influence the use of smartphones for travel through two effects: "transformation effect" and "spillover effect". The transformation effect refers to the situations where the use of smartphones in everyday context changed people's perceptions towards the capabilities of smartphones, the way of consuming information, and the way of communication, thus, informants are likely to change their ways of information consumption and communication in travel by using smartphones. For example, if informants increased their use of smartphones as a tool to access online information (*InfoAccessTool*), the informants learned that they can access to online information anytime and anywhere and they knew how to find the information they need from smartphones. If the informants reported to increase their connections with others after the adoption of smartphones (*MoreConnected\_Life*), the informants changed their ways and frequencies to contact their family and friends. If the informants reported that they learn more about technology because of smartphones (*TechSavvy*), the informants learned more apps of smartphones. In all, as the results of these changes, the informants used smartphones to do information search in travel, to contact their family and friends with text messages, and to use lots of new apps in travel.

The spillover effect refers the situations where the informants carried the same use of smartphones in everyday context to their trips. In everyday context, the informants reported that they used smartphones to replace some devices (e.g. GPS) or they used

smartphones as the extension of some devices (e.g. desktop computer) (*Extension/ReplaceDevice*). The informants also reported that they adopted some new behavior (e.g. text messages) (*NewBehavior*), developed some new routines (e.g. checking emails every half an hour) (*Routines/Habits*), or got used to fill their down times with using smartphones (*UseOfDownTime*). These changes enabled informants to do similar things in the context of travel because they have replaced the original devices and got used to the new routines. For example, the informants replaced the GPS device with smartphones for navigation in everyday context, and then they also used smartphones rather than GPS device during trips. The informants learned to take photo and share with others by using smartphones in everyday context, and then they also reported to do the same thing during trips. This study argued that the transformation effect and spillover effect connected the use of smartphones in the context of everyday experience and travel.

#### *4.3.2 The Changes in Everyday Experience and the Extrinsic Motivations for the Use of Smartphones for Travel*

The analysis of inexplicit relationships indicates that the changes in everyday context are associated with the use of smartphones for travel by causing some extrinsic motivations, which directly lead to the use of smartphones for travel. For example, Informants (#5, #11, and #20) got used to use smartphones to check emails when they don't have the computer access in everyday context. Based on this, they reported that they felt more connected with others with the ubiquitous access to email accounts. Then they reported that they kept checking emails to get information about the things in their workplaces because they felt that they wanted to be connected. As such, the "checking email" behavior in everyday context was carried into travel context because the

informants felt that they enjoyed the feeling to be connected (*KeepConnected/Informed*), and such feeling motivated them to keep the behavior even in a different context (i.e. travel). The similar mechanism operates behind the association of “check news” in everyday context and “check news” in travel context. For example, Informant #23 reported that he checked news throughout the day with smartphones in his everyday life, and he felt more connected with such use. In his explanation of “check news” in travel context, he said: *“The need to feel connected to what was happening in Ohio, where I live.”*

Also, Informants reported that they become more connected with family and friends through Facebook or text message because they increased their use of Facebook to update their status and share photos. And such increased use of Facebook is associated with the extrinsic motivation “Social fun”. The use of Facebook created a sense of community. The users expected feedback from others. As the Informant #3 commented that:

*“I have like a certain group of friends that always like, it doesn't matter what it is. They'll always like everything that I put up. So there are like four or five people there that will do that. And vice versa - I do that to them. ... But then once in a while when someone random does it, like you haven't really talked to in a while, it's like oh, I really got their interest. This is interesting that like they cared enough to like this and we don't speak that much. So that's interesting. That's cool.”*

#### *4.3.3 The Changes in Everyday Experience and the Intrinsic Motivations During Travel*

The use of smartphones in everyday context developed some new routines or habits such as checking email regularly (e.g. every half an hour, Informant #2), browsing Facebook posts once after wake up, taking photos and sharing with friends, and filling downtimes by browsing Internet, reading news/books. Some of these routines have developed to be habits. As Informant #2 mentioned that she just got used to check email

every half an hour or even every twenty minutes if she is not involved in anything, even if she knew no new emails coming. Also, due to the strong computation capability and multi-functions of smartphones, the informants use smartphones to replace other devices (e.g. iPod) to carry on their “old” routines (e.g. listen to music). These routines (new and old ones) and habitual behaviors triggered the intrinsic motivations to perform the same things in travel. Informants #20 explained why he listened to music in his transit process to Washington DC in that he has to listen to music when he is alone and this is his habit. Informants (#2, #4, #5, #14, #20, and #23) reported that they used smartphones to do self-entertainment whenever they were bored during trips because this is how they deal with boring in their everyday lives. As such, the use of smartphones in both contexts are connected through the intrinsic motivations.

Additionally, the informant #22 reported that she got used to use smartphones to search for information before making decision. This kind of behavior almost became a habit because she would feel uneasy if she did not search for information. She reported that this habit of information search influenced her travel experience in a way that she did not necessarily like, because she lost the fun of adventure in travel. She illustrated that

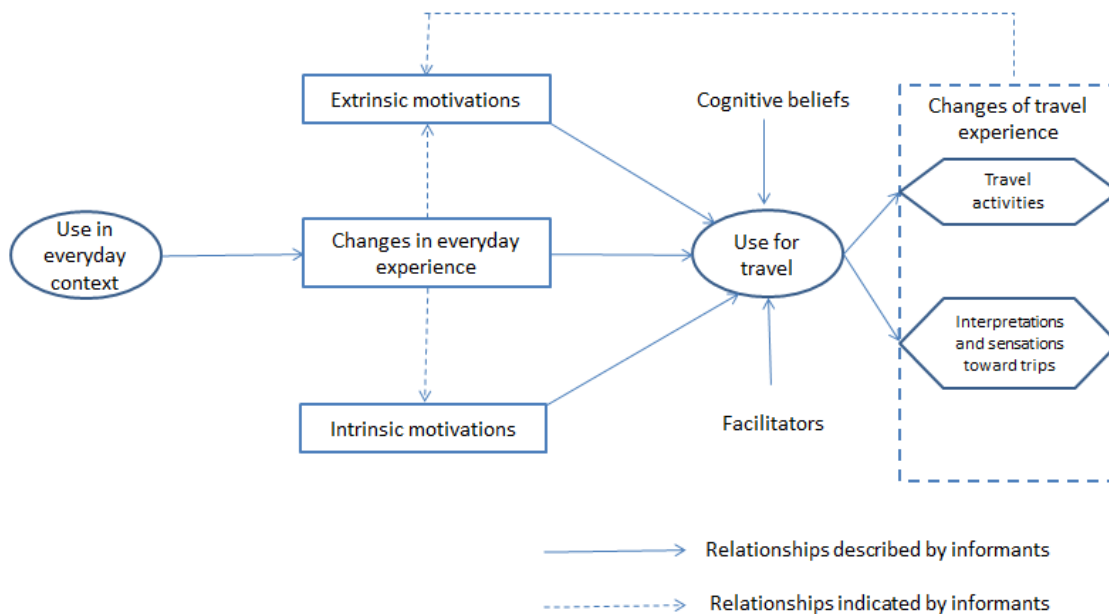
*“As a traveler prior to the Smartphones, I was always one to want to discover things naturally, organically, never actually researching prior to, say, leaving my hotel room. But now, with the cell phone or with the Smartphones, I think that that essence has been taken away by that. Because I can walk around and still try to discover things organically. But at the same time, I’m walking and researching at the same – on my mobile – and I could be missing what’s around me, because I’m so focused on what I’m researching on my Smartphones, as opposed to actually not using it and just looking around and seeing what is something that might look interesting, and walk into a store or shops and feel like that.”*

*Because I have something in mind what I want to do or what I think I wanna do; and I forget that the biggest pleasure of my travels is just to get lost somewhere in the city, in any city, and just find a great place that I could say, "Hey, this is something that's so cool.*

*(I have to search in travel) It's become a conditional thing, because the mobile has been such an important thing in my life that I've created for myself. I've become so dependent upon it that, trying to wean off of it is not an easy task at all."*

#### *4.3.4 Mechanisms Shaping the Use of Smartphones for Travel*

The mechanisms consist of seven parts (i.e. the use of smartphones in everyday context, the changes in everyday experience, the use of smartphones for travel, the motivations of the use of smartphones for travel, cognitive beliefs toward smartphones, situational and personal facilitators, and the changes of travel experience) and three sub-processes, including 1) the changes in everyday experience and the influence on the use of smartphones for travel (*EverydayChanges —TravelSmartphonesUse*), 2) the changes in everyday experience and the extrinsic motivations in travel (*EverydayChanges —ExtrinsicMotivations*), and 3) the changes in everyday experience and the intrinsic motivations in travel (*EverydayChanges —IntrinsicMovtivation*).



**Figure 8. Mechanisms Shaping the Use of Smartphones for Travel**

Figure 8 presents the mechanisms shaping the use of smartphones for travel. The uses of smartphones in everyday context provide a basis for the uses of smartphones in the context travel. Informants reported seven changes in everyday context after the adoption of smartphones: 1) use of smartphones as an extension or replacement for other tools (*Extension/ReplaceICTTools*); 2) new behaviors from the use of smartphones (*NewBehavior*); 3) increased connections with others (*MoreConnected\_Life*); 4) increased use of smartphones as a tool to access information (*InfoAccessTool*); 5) development of new routines or habits (*Routines/Habits*); 6) the use during “downtime” (*UseOfDownTime*); and 7) becoming more “technologically savvy” (*TechSavvy*).

With these changes, the use of smartphones in everyday context influence the use of smartphones for travel through three sub-processes. First, the use of smartphones in everyday context changes the ways of communication, consuming information, and replace other digital or information communication devices. As such, the use of smartphones in everyday context influence the use of smartphones for travel through the transformation effect and spillover effect. Second, the use of smartphones in everyday context influence the use of smartphones for travel by generating some extrinsic motivations in the context of travel. For example, in everyday context, people increase their use of Facebook due to the ubiquitous Internet access provided by smartphones. Such increased use of Facebook brings more social activities to people, and they quite enjoy the fun from these social activities. Thus, during trips, people are motivated to share their experience with friends through Facebook or to continue their participation in the discussions in the Facebook community. Smartphones enable people to fulfill these motivations during trips. Third, the use of smartphones in everyday context influence the use of smartphones for travel by generating some intrinsic motivations in the context of travel. The routines or habits associated with the use of smartphones such as checking emails at a regular basis, fulfilling downtimes with smartphones are also carried to the context of travel. Thus, some uses of smartphones during trips are intrinsically motivated.

In the context of travel, the cognitive beliefs and facilitators are two sets of factors that ensure selection of a smartphone in the context of travel, rather than alternatives. The fundamental factors driving the use of smartphones for travel originate from the contextual factors of travel. A series of spontaneous information needs encouraged extrinsic motivations motivating travelers to use smartphones. For example, a traveler

may have a spontaneous information need to find a restaurant, obtain directions, arrange transportations, find accommodations, plan (or re-plan) trips, seek for things to do during trips, or arrange for shows. Thus, travelers may use smartphones to search for relevant information. Also, travelers have social needs to remain connected with families and friends or to stay informed about work or news. As such, they use smartphones for text messaging, updating Facebook status, sharing photos, and checking email and news. In addition, travelers maintain some of their routines or habits from everyday experience to the context of travel. These routines or habits encourage the intrinsic motivations to use smartphones to perform these routines or habits in the context of travel. For example, travelers get used to use smartphones to fill their downtimes in their everyday lives. Similarly, in travel, they use their smartphones to listen to music, play games, and watch movies whenever they become bored during trips.

Additionally, the use of smartphones for travel changes people's travel experience from several aspects including travel activities (i.e. pre-trip planning, en-route arrangements, and after-trip activities) and travelers' interpretations and sensations toward trips. These changes potentially influence the use of smartphones for future trips. For example, the current use of a smartphone induces changes of travel planning. Travelers would rather make fewer plans before the trips, and be more flexible and more likely to change their plans during the trips. As such, the changes in perceptions towards travel planning induce the conditions for the rise of spontaneous information needs as well as extrinsic motivations to use smartphones for travel.

In summary, this study identifies a variety of factors from different contexts (i.e. everyday life and travel) and from different sources (i.e. travelers and environment) that

interact to shape the use of smartphones for travel. Some sets of factors such as cognitive beliefs toward the effectiveness of smartphones in satisfying information needs and facilitators from specific circumstances (e.g. no computer access) help people choose smartphones to perform the tasks. However, the fundamental factors encouraging travelers to use smartphones originate from the contextual factors of both travel and everyday experience. In addition, the current use of smartphones for travel may lead to future use of smartphones for travel by changing travel experience.

#### **4.4 Chapter Summary**

The chapter is organized to answer three research questions and integrate findings to illustrate the mechanisms shaping the use of smartphones for travel. The first research question is about the uses of smartphones for travel. Four categories of use activities were identified, including communication, entertainment, facilitation, and information search. The informants reported the specific circumstances in which the smartphones were used before and during trips.

The second research question is about the factors influencing the use of smartphones for travel. Five sets of factor were identified to be associated with the use of smartphones for travel, including the extrinsic and intrinsic motivations, cognitive beliefs towards smartphones, situational and personal facilitators (e.g. no computer access, the use of information services on PC platform), the use of smartphones in everyday context and the changes from such use, and the impact of use of smartphones on travel experience.

The third research question is about the mechanisms shaping the use of smartphones for travel. The mechanisms consist of seven parts (i.e. the use of

smartphones in everyday context, the changes in everyday experience, the use of smartphones for travel, the motivations of the use of smartphones for travel, cognitive beliefs toward smartphones, situational and personal facilitators, and the changes of travel experience) and three sub-processes, including 1) the changes in everyday experience and the influence on the use of smartphones for travel (*EverydayChanges — TravelSmartphonesUse*), 2) the changes in everyday experience and the extrinsic motivations in travel (*EverydayChanges — ExtrinsicMotivations*), and 3) the changes in everyday experience and the intrinsic motivations in travel (*EverydayChanges — IntrinsicMotivation*). The use of smartphones in everyday context provide a basis for the use of smartphones for travel, because the use of smartphones in everyday context changed people's way of communication, way of information consumption, and even lifestyle. Such changes influence travelers' use of smartphones for travel through transformation effect and spillover effect. The people's changes in everyday context are also associated with the generation of extrinsic and intrinsic motivations in travel, which directly drove the use of smartphones for travel. Finally, the use of smartphones for travel also changed travel experience. These changes suggested the use of smartphones in future trips

The chapter presents a descriptive framework describing the mechanisms shaping the use of smartphones for travel. Further investigation identifies that the factors shaping the use of smartphones for travel vary from different kinds of uses of smartphones. Also, different kinds of uses of smartphones for travel lead to different changes of travel experience. Such differences suggest the heterogeneity of the use of smartphones for travel. In order to provide a comprehensive understanding of the focal phenomenon, the

next chapter describes the mechanisms shaping different kinds of uses of smartphones for travel.

## **CHAPTER 5.**

### **DIFFERENCES IN THE MECHANISMS SHAPING THE DIFFERENT USES OF SMARTPHONES FOR TRAVEL**

This chapter presents the mechanisms shaping different uses of smartphones for travel, including communication, entertainment, facilitation, and informational search. This study identified that the factors influencing the use of smartphones for travel are different from four categories of activity. Also, the impacts of use of smartphones for travel on travel experience vary from four categories of activity. In addition, the different use of smartphones in everyday context influence the use of smartphones for travel differently.

#### **5.1 Mechanisms Shaping the Use of Smartphones for Communication for Travel**

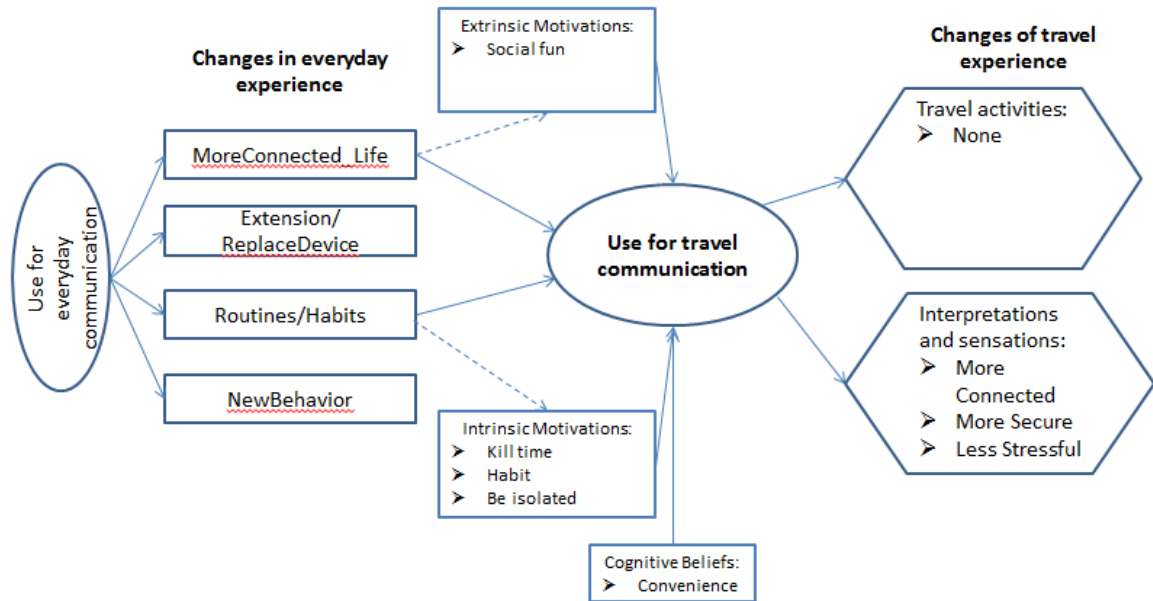
Figure 8 presents the mechanisms shaping the use of smartphones for communication during travel. The use of smartphones for communication (i.e. calls, email, Facebook, and text messaging), mainly caused by extrinsic motivations, encourages people to maintain connections with others to remain informed of people and news from everyday context (*Keep connected/informed*) and to seek satisfaction from social activities (*Social fun*). Also, the use of smartphones for communication associate with intrinsic motivations such as “Habit.” The informants reported that they continuously checked email during trips to remain informed of the occurrences related to jobs or businesses (i.e. Informants #5, #7, #10, #11, #13, #19, #20, and #23). Also, Informants #10, #19, and #23 reported developing the habit of continuous checking email accounts every day, so the behavior from an everyday context transferred to a travel context. Informants (#3, #11, #13, #20, #22, and #24) reported completing phone calls

and sending text messages to remain connected with others who were not traveling and travel companions in different locations. Some informants who used Facebook to share experiences during travel reported that their friends or families requested postings (e.g. Informant #22). Some informants (#20 and #23) who used Facebook to browse wall posts reported habitually checking Facebook to avoid boredom or had down time. In addition, the informants mentioned that perceived convenience motivated the habit of using smartphones to check email accounts and Facebook. Finally, the use of smartphones for communication for travel led to different interpretations toward trips. The informants perceived that their trips became more connected with families, friends, and workplaces. Also, the use of smartphones for communications enhanced the sense of comfort during travel by creating the perceptions of safety and reduced stress. The informants reported this change because they knew that they could access help, anytime and anywhere, and they could become familiar with situations in everyday context so they do not need to worry.

The use of smartphones for communication for travel associates with use of smartphones for communication in everyday life through changes in everyday experience, such as *MoreConnect\_Life* and *Routines/Habits*. Although the informants reported perceiving four kinds of changes from use of smartphones for communication in everyday life, they only confirmed two of the changes (i.e. *MoreConnect\_Life* and *Routines/Habits*) associate with use of smartphones for communication during travel. For example, informants (#8, #9, #11, and #14) reported feeling more connected with others and the external world due to increased frequency of checking email accounts and social networks (i.e. Facebook) in everyday life. Informants (#8, #11, and #12) reported

continuously checking email and social networks during trips to maintain connections.

Informant #11 reported feeling an imperative to check email during trips because this was a routine and need to remain informed of activities in the workplace.



**Figure 9. Mechanisms Shaping Use of Smartphones for Communication for Travel**

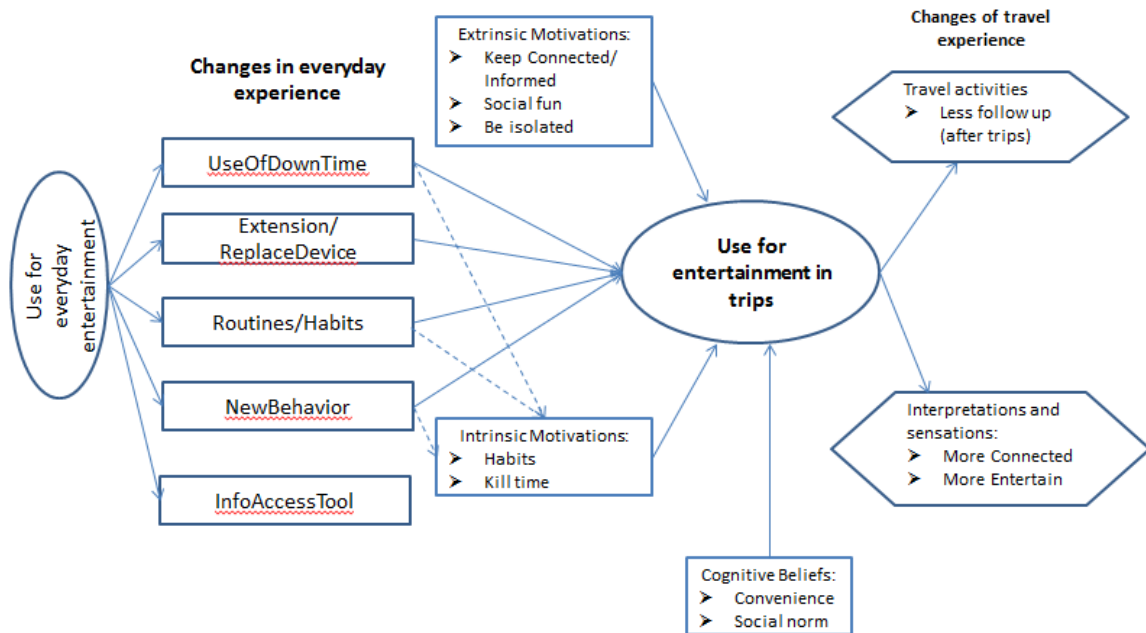
## 5.2 Mechanisms Shaping the Use of Smartphones for Entertainment for Travel

Figure 10 presents the mechanisms shaping the use of smartphones for entertainment for travel. Travelers used smartphones to capture and share photographs as well as engage in other activities for entertainment, such as listening to music, playing games, reading books, surfing the Internet, reading news, and watching movies. Except for photography, the other six activities of smartphones use were for self-entertainment when informants (#2, #4, and #20) became bored and had unassigned time to fill. The

intrinsic motivations reported drove these self-entertainment activities. Informants (#4 and #20) reported developing the habit of filling “downtime” or “boring time” (e.g. waiting time, transit processes) by using smartphones for self-entertainment. Extrinsic motivations also drove use of smartphones for entertainment during travel. One of those motivations is isolation from others to find quiet time during travel. Also, Informants #4 and #6 mentioned that peers’ expectations motivated capturing and sharing photographs to maintain connections. In addition, the popularity of the use of social networks and high-quality photographic capabilities of cameras in smartphones encouraged informants to photograph and share images during trips. The informants reported that the satisfaction and fun brought by social interaction on the social networks motivated the photographic activities. In addition, convenience led informants to use smartphones to engage in self-entertaining activities rather than using alternatives. The use of smartphones for entertainment during travel led to some changes in travel experience. Informants reported that before adopting smartphones they would rather do nothing in “downtimes” during travel, because they did not want to carry different kinds of digital devices. As such, the informants reported that they perceived that their trips become more fun and more connected through social networks. Also, Informants #15 and #17 reported moving follow-up activities after a trip, such as sharing photos and experiences, to the “during a trip” stage.

The use of smartphones for entertainment during travel associates with the use of smartphones for entertainment in everyday context arising from changes in everyday experience. For example, Informant #10 reported developing the habit of using a smartphone for activities, such as playing games, surfing the Internet during free time in

everyday life (*UseofDownTime*). During a trip to California, he used his smartphone to surf online to fill the travel time. Also, Informants (#13 and #18) reported that due to the portability of smartphones, they crated photographs to record their lives more often than before (i.e. *Extension/ReplaceDevice*, *Routines/Habits*, and *NewBehavior*); they also reported using smartphones to photograph to share with friends.



**Figure 10. Mechanisms Shaping Use of Smartphones for Entertainment for Travel**

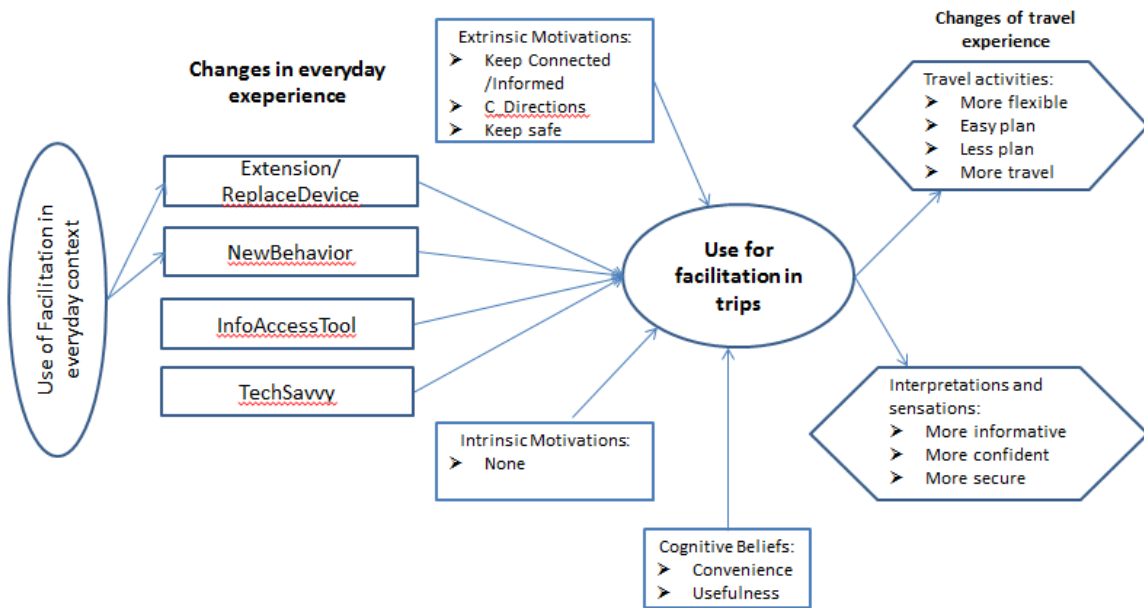
### 5.3 Mechanisms Shaping the Use of Smartphones for Facilitation for Travel

Figure 11 presents the mechanisms shaping use of smartphones for facilitation in travel. The drivers of use of smartphones for facilitation are extrinsic motivations, such as wanting to be connected (*Keep connected/informed*) and spontaneous need for directions (*C\_Directions*); the intrinsic motivation are to be safe (*Keep safe*), and the cognitive

beliefs are perceived convenience (*Convenience*) and perceived usefulness (*Usefulness*). The informants (#5 and #20) mentioned appreciating remaining informed of their geographic locations (by using navigation applications, even when not driving), weather conditions at destinations, and flight information (e.g. schedule, gate). Informants (#5, #14, #18, #21, and #22) reported the need to feel safe motivated using navigational application to identify geographic locations. Informant #2, for example, used a smartphone to manage an itinerary before and during a trip because of convenience. Finally, the informants reported that perceived usefulness is one reason for using smartphones for navigation, purchasing tickets for shows or transportations, and itinerary management before and during trips. The results indicate that use of smartphones for facilitation during trips strongly influenced travel planning. The informants perceived that planning travel is easier and more flexible, because they did not need hard copies of maps, and locating places to go can occur anytime. Also, they indicated the tendency to plan less and travel more due to facilitation from smartphones. In addition, the informants reported becoming more informed, more confident, and more secure during travel because being lost was unlikely (Informant #5), and could “dress appropriately depending on weather” (Informant #2), and “get instant notification of the changes (flight or boarding gate)” (Informant #19).

The use of smartphones for facilitation for travel associates with use for facilitation in everyday context through changes in everyday experience, such as *Extension/ReplaceDevice*, and *NewBehavior*. For example, several informants (e.g. #10, #13, and #22) mentioned that they replaced their GPS devices with the GPS application on smartphones due to convenience and no cost. On trips, they reported using

smartphones as a navigation tool. Also, Informant #22 reported becoming accustomed to using a smartphone’s calendar to manage everyday schedules. Thus, this informant transferred that use to managing itineraries. Besides the changes brought by the use of smartphones for facilitation in everyday life, other changes developed from other everyday uses of smartphones influenced use of smartphones for facilitation for travel. For example, Informant #11 mentioned that a smartphone was very helpful for tracking flights because of the perception that the smartphones provides access to online information, anytime and anywhere (*InfoAccessTool*). Informant #22 reported using TripIt to manage an itinerary as a result of reading *PC* magazine regularly and learning the application (*TechSavvy*).



**Figure 11. Mechanisms Shaping Use of Smartphones for Facilitation of Travel**

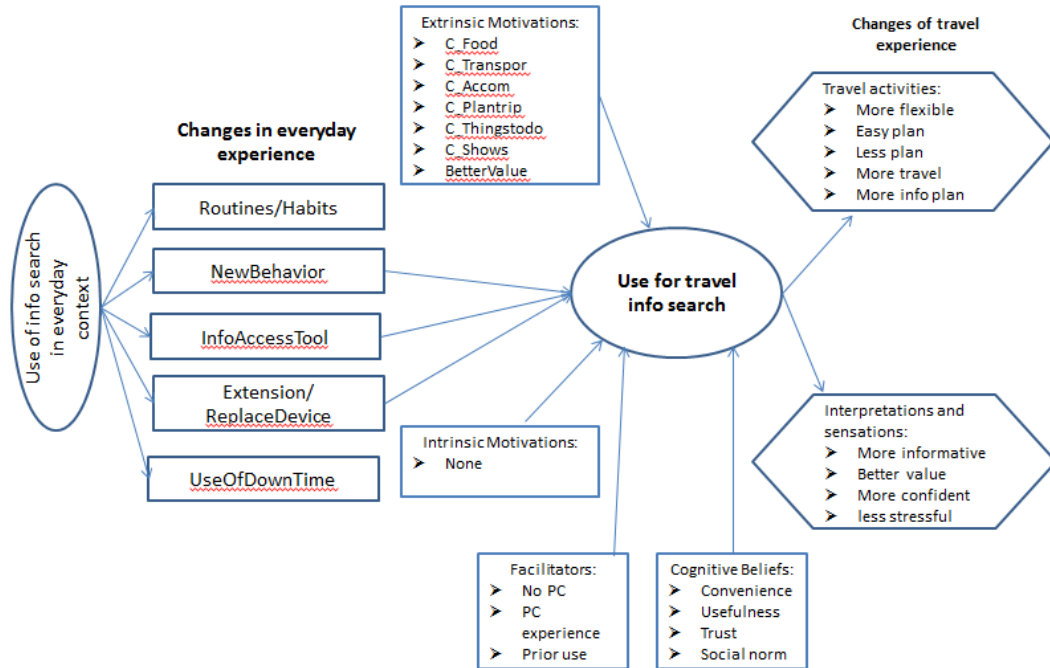
## **5.4 Mechanisms Shaping the Use of Smartphones for Information Search for Travel**

Figure 12 presents the mechanisms shaping the use of smartphones for informational searches for travel. Extrinsic motivations, which originate from specific circumstances during travel, are the main trigger for using of smartphones for informational searched. The seven extrinsic motivations driving the use of smartphones relate to informational needs for arranging food/restaurants, transportation, accommodations, prior and en-route trip planning, things to do at a destination, shows, and seeking travel-related bargains. Informants described specific scenarios, which triggered informational search with smartphones, and they highlighted the informational needs raised in those circumstances. In addition, four cognitive beliefs and three facilitators work together to guarantee use of smartphones for informational searches rather than any other ICT tools or alternative methods (e.g. asking concierge). Informants reported believing in the usefulness of informational resources (websites) from the Internet and trusting them. Construction of such perceptions might arise from previous experience with mobile and computer platforms and/or perceived social norms. As such, when computer access is not possible, smartphones become the most convenient tool for informational searches.

Figure 12 also presents that the use of smartphones for informational searches changed travel experiences by three dimensions (i.e. travel planning, perceptions towards trips, and attitudes towards travel). For example, Informant #9 commented disbelief in having an enjoyable trip without the support of a smartphone. This informant reported that, before adopting a smartphone, travel planning was very stressful from attempting to

plan every detail, because Internet access would be unavailable at the ski resort. Now, with a smartphone, informational support would be available anytime, requiring less preparation and induce less stress. Also, this informant used twitter to follow the events and news of the ski resort while there, and adjusting the plan could occur anytime depending on changing weather or circumstances..

Everyday use of smartphones for informational searches, reportedly, changed informants in five aspects (i.e. *Routines/Habits*, *NewBehavior*, *InfoAccessTool*, *Extension/ReplaceDevice*, and *UseofDownTime*). Three aspects (*NewBehavior*, *InfoAccessTool*, and *Extension/ReplaceDevice*), reportedly, influenced the use of smartphones for informational searches for travel. For example, the most influential factor is the change of *InfoAccessTool*. Informants (#9, #15, and #22) confirmed that by relying on smartphones to access online information, the perception is that smartphones can be the main informational resource during trips. Also, Informant #15 reported learning to use Groupon to search for bargain in everyday life (*NewBehavior*), and this transferred to using Groupon to find special pricing during a trip to the Grand Canyon. Informant #13 reported using a computer less for informational searches in everyday life because smartphones is so convenient (*Extension/ReplaceDevice*). This informant reported several occasions of use of a smartphone to search for information during trips.



**Figure 12. Mechanisms Shaping the Use of Smartphones for Information Search for travel**

## 5.5 Chapter Summary

In summary, this chapter identifies a diversity of factors influencing the various categories of using smartphones for travel and the changes of travel experience in different aspects triggered by different uses of smartphones. The use of smartphones for travel communication, travel facilitation, and travel-related informational searches are more likely triggered by extrinsic motivations, while uses for entertainment purpose are more likely triggered by travelers’ intrinsic motivations. The cognitive belief in “convenience” is preminent as the most important factor leading to selection of smartphones for four kinds of activities. The cognitive belief of “usefulness” contributes to selection of smartphones for activities with strong practical purposes (i.e. travel facilitation and travel informational searches). Compared to other categories of use, more

complicated mechanisms involving a variety of extrinsic motivations arising from specific travel-related circumstances and interactions of cognitive beliefs and facilitators shape use for travel informational searches. Different categories of use also influence travel experiences in various ways. The use of smartphones for communication and entertainment are more likely to influence travelers' interpretations and sensations. Use of smartphones for travel facilitation and travel-related informational searches mainly influence travel activities but also travelers' interpretations and sensations toward trips.

The various uses of smartphones for travel associate with changes in people's everyday context. The influence of some changes appears to be predominant for some activities. For example, the change of *MoreConnected\_Life* only associates with use of smartphones for communication during travel. That is, if people become closer with families and friends from use of smartphones in everyday context, they will likely contact these people more frequently during travel. The change of *UseofDownTime* only associates with use of smartphones for entertainment during travel. That is, if people begin to use smartphones to fill down times in everyday context, they are more likely to use smartphones to fill the down times during travel. The change of *InfoAccessTool* is more likely to influence travelers' informational searches using smartphones for travel.

The findings presented in last chapter and this chapter (Chapters 4 and 5) suggest that the factors, identified in the different streams of literature in the fields of travel, management information systems, and organizational studies, shape use of smartphones for travel. The next chapter discusses the findings of this study with as related to relevant literature and develops propositions and theoretical frameworks, which shape use of smartphones for travel.

## **CHAPTER 6.**

### **USE OF SMARTPHONES FOR TRAVEL: A THEORETICAL FRAMEWORK**

As posited in Chapter 2, the extant literature does not provide an integrated theoretical framework to describe the mechanisms shaping the use of smartphones for travel nor guide empirical studies of this phenomenon. The purpose of this study is to develop a theoretical framework to describe the mechanisms shaping the use of smartphones for travel by employing a phenomenological approach. Based on the findings described in previous two chapters (Chapter 4 and 5), the focal phenomenon (i.e. the use of smartphones for travel) has emerged. This chapter discusses these findings in the relevant literature and tries to anchor the emergent framework in theories. Thus, the propositions, developed with theoretical support, organize the theoretical framework. First, a summary of the main findings provides a structural description (Moustakas, 1994) of the use of smartphones for travel. The research questions guide the presentation of main findings. Second, the discussion relates these findings to the relevant literatures to introduce the theoretical contributions of this study. Seven concepts and four propositions from the discussion become the foundation for a theoretical framework describing the mechanisms shaping the use of smartphones for travel. The propositions are about the use of smartphones for travel and impact of such use on travel experience, the factors influencing the use of smartphones for travel, the association between the use of smartphones in everyday experience and travel, and the process which shapes the use of smartphones for travel.

## 6.1 Main Findings

The interviews with twenty-four American provided understanding of the antecedents, processes, and outcomes of the use of smartphones for travel. The findings of this study are organized to describe the focal phenomenon, the use of smartphones for travel. The research questions guide the presentation of the structural description of the phenomenon (Moustakas, 1994).

### 6.1.1 *Research Question 1: “What did you do with your smartphone for your travel?”*

Research Question 1 explores the use of smartphones for travel. Exploration of this research question arises from asking informants to describe their most recent leisure trips and the use of smartphones for/during those trips. The informants revealed that they used smartphones far more than mobile phones with basic functions.

First, smartphones are a communication tool for travelers to maintain connection with families, friends, and anything else associated with everyday context. Smartphones perform the basic functions as any other mobile phone to enable people to place calls anytime and anywhere. However, besides this most basic function, smartphones enable many communicative functions due to strong computation capability. Smartphones support downloading and installing mobile applications offered by a third-parties. Thus, people can access new ways of communication associated with the ubiquity of the Internet (Turkle, 1994) from desktop/laptop computers to mobile platforms. For example, people have applications for smartphones for email, such as Gmail, Mail, etc. These applications provide travelers with access to email accounts. Also, people downloaded and installed applications for favorite social networks, such as Facebook, Twitter,

Foursquare, etc. As such, traveler can perform activities on the social networks during trips as they usually done in everyday lives. In addition, people installed applications supporting text messaging without any fees. This convenience encouraged travelers to use text messaging to maintain connections and incurring low or almost no cost.

Second, smartphones are a “source of entertainment for travelers” (Informant #2) during trips. Smartphones are an agglomeration of multiple, digital devices and software such as mp3 players, video/movie players, cameras, digital book readers, Internet Explorer, and computer games. The informants commented that smartphones are “excellent” (Informant #20) for filling downtimes during trips such as transit processes and waiting times, which create of “breaks” leaving travelers with “nothing to do” (Informant #10). To fill the time and avoid boredom, travelers use smartphones to read news/books, play games, listen to music, watch movies/videos, or surf the Internet. Furthermore, a main entertainment brought by the use of smartphones comes from the using them as camera for photographing and sharing the photos instantly with families and friends through messaging or social networks. Such instant communication and experience sharing bring “instant happiness I never ever had before” (Informant #15).

Third, smartphones are a valuable “assistant” (Informant #6) or “secretary” (Informant #7) before and during trips by offering application to function as GPS and Personal Digital Assistant devices (PDA). Travelers can use Google Maps to plan routes before trips through the applications’ powerful navigation and attractions/accommodations search functions. Travelers used smartphones to record because smartphones recognize addresses and telephone numbers and automatically connect with navigation applications and calling functions. Travelers also used

smartphones to manage itineraries through applications such as TripIt's synchronization of confirmatory emails from airlines and hotels with the itineraries that travelers establish. In addition, smartphones are "intelligent," providing alerts when traveler's flights change boarding gates or schedule delays. Therefore, the travelers used smartphones to help them for trip planning as well as en-route facilitation.

Finally, travelers agreed that smartphones are most helpful in terms of information searches, when operated as a fully functioning computer. The processors in smartphones support similar or even faster Internet access speeds, and touch keyboards allow performing searching similar to traditional computers. Furthermore, nearly universally available Internet connections and quick initiation processes grant an advantage to smartphones as tool for "quick information search." As Informant #15 described, for preparing a trip to Las Vegas, the smartphone allowed searching conveniently for flight information and a "Blue Man" show information because smartphones is only and the most convenient tool to get online when he and his travel companion talked about flight in cafeteria and talked about the show in tennis court. Also, the informants used their smartphones to search for information or discounts for flights, hotels, restaurants, and attractions/activities, through applications designed specifically for such searches through Priceline, Expedia, or Groupon. These applications offer better solutions to locate, quickly, information of interest rather than overwhelming options from the keywords searching.

In summary, four categories represent use of smartphones for travel (including 25 unique activities) identified by informants. They are the use of smartphones for communication, entertainment, facilitation, and information search during travel.

Smartphones for informants are an agglomeration of multiple digital devices and a portable computer with commonly available Internet access. The investigation of Research Question 1 establishes a foundation for the two subsequent research questions. With the Research Question 1 addressed, the study next addresses factors associated with the use of smartphones for travel.

#### *6.1.2 Research Question 2: “Why did you use a smartphone to do that?”*

The intent of Research Question 2 is to identify the factors influencing the use of smartphones for travel. This research question asked informants to express the reasons behind the uses they mentioned. The use of smartphones for travel are the outcomes of mixed factors in the contexts of travel and everyday experience. Specifically, the informants identified three sets of factors that directly led them to use smartphones for specific situations. In addition, the informants indicated that everyday use of smartphones associate with the uses for travel, and the current use of smartphones for travel may influence their use for future trips.

#### *Motivations*

Travelers used different functions of smartphones to achieve different purposes such as communication, entertainment, facilitation, and information search. Differing extrinsic or intrinsic motivations prompted activities to satisfy informational needs. For example, travelers used smartphones to make phone calls and text message their families, because they wanted to maintain contact with those who had an interest in the informants' status and activities. Travelers used smartphones to check both personal and work email accounts, to remain informed of news of others and events in the workplaces. Also,

during trips, travelers used smartphones to read news, listen to music, and watch movies when they “have time” (down times), since they habitually used smartphones to avoid boredom or to fill empty time. In addition, one of the major uses of smartphones is searching for information because travelers have more opportunities than they do in everyday context to encounter unexpected situations, to change plans, and to initiate new plans. Thus, travelers, who have become accustomed to using the Internet, preferred to use smartphones for information searches to satisfy their needs for directions, hotels, flights, local transportations, etc.

#### *Cognitive Beliefs and Situational and Personal Facilitators*

The smartphones had application on many occasions in travel, which fulfilled motivations arising from belief in the effectiveness of smartphones and some situational facilitators. When travelers need information during trips, they may choose to use other ICT tools such as laptops or other alternatives such as asking a hotel’s concierge; however, smartphones replaced these alternatives. The informants reported that they used smartphones because of convenience and ease. The informants also mentioned that they used smartphones because they trusted the online information sources more so than alternatives. In addition, some informants mentioned situational and personal facilitators which lead them to choose smartphones. For example, Informant #18 mentioned using a smartphone to find a taxi company and to make a reservation when in New York because the smartphone was the only way to gain online access while standing on a busy street. Informant #14 mentioned using the Stubhub application to purchase baseball game tickets because of experience using the site from a desktop computer for the same purpose.

### *The Impact of Use of Smartphones on Travel Experience*

The informants indicated that different uses of smartphones for travel can influence different aspects of their travel experience, and such influences may affect use of smartphones in the future. For example, in terms of information search, smartphones provided reliable access to online information sources as well as mobile applications that specialize in facilitating the decision-making for issues such as finding restaurants, searching for car rentals, etc. Thus, with better information support provided by smartphones, travelers began to leave some pre-trip decision-making to the moment of specific need. These decisions could be for some trivial things such as the places for meals or fuel or even some major elements of trips such as the activities at destinations. The informants reported that they tended to make less preparation for their trips because on-site decisions were possible by support of smartphones and better understanding of real situations. Also, travelers became more flexible and tended to change their plans during trips if the unexpected occurred or plans prove unsatisfactory. The impact of smartphones' use on travel planning may create more occasions during future trips for travelers' unpreparedness and the need for smartphones' support.

Other aspects of travel experiences that changed from the use of smartphones were travelers' interpretations and sensations toward travel. For example, the informants reported that they felt more informed during trips, because smartphones provided great informational support whenever they were in unfamiliar places or they felt curious about the new things at destinations. Thus, with better understanding of surroundings, travelers enjoyed trips by making better arrangements and learning more from their experiences. The informants also reported that the use of smartphones enabled them to connect with

families, friends, and external worlds, constantly, and such connections made them feel more secure and less stressful. The changes in travelers' perceptions and attitudes towards travel may influence future use of smartphones for travel because of perceived benefits.

### *Everyday Use of Smartphones and Changes in Everyday Experience*

The informants also indicated that the use of smartphones for travel associated with the use of smartphones in everyday context. People adopted smartphones first to support their everyday communicative and informational needs. The informants reported that they used smartphones for communication, entertainment, facilitation, and information searches in everyday context. These were the main purposes for adopting smartphones. The use of smartphones in everyday context changed the ways of communication, information consumption and even life styles (e.g. develop new routines or habits). First, smartphones enabled using messaging services, Skype, email, and social networks almost anytime and anywhere due to the general availability of connections to the Internet. Communications software provided different ways to communicate and keep connected other than phone calls. The informants reported that they preferred these new ways of communication due to advantages such as free of charge and low probability of disturbing others. Also, these new ways of communication increased the frequencies of communications and constructed closer relationships between the users and others. Some informants (e.g. Informant #22) reported that becoming closer to families and friends because they increased the use of Facebook after the adoption of smartphones.

Second, the use of smartphones increased the efficiency and effectiveness of online information consumption. Some informants (e.g. Informants #11 and #18)

reported increasing consumption of the online informational resources because of greater opportunities to search with smartphones when “outside” (i.e. without access to desktop computers). Some informants (e.g. Informants #14 and #15) reported preferring to use smartphones for searches even with access to a desktop computer, because smartphones are faster and some applications are more efficient.

Third, the use of smartphones changed people’s life styles by developing new routines or habits, changing activities during down time, and shaping new attitudes towards technology. Some informants (e.g. Informants #2 and #11) reported that checking emails regularly, perhaps every 20 minutes or half an hour, have become habits, because of feeling uneasy if access was not possible. Some informants (e.g. Informants #10 and #15) reported that becoming accustomed to using smartphones to fill down times. That is, whenever bored, smartphones allowed listening to music, browsing news, etc. Some informants (e.g. Informants #6 and #8) acknowledged becoming more technologically savvy after adopting a smartphone, because technology (e.g. smartphones applications) brought benefits to life. All these changes in people’s everyday experience after adopting smartphones associate with the use of smartphones for travel. As mentioned in the previous chapter, the informants indicated that changes led to different uses of smartphones for travel. The next section summarizes the association of smartphones’ use in the contexts of everyday experience and travel, and describes the mechanisms which shape the uses of smartphones for travel.

### *6.1.3 Research Question 3: “What are the processes shaping your use of smartphones for travel?”*

Research Question 3 aims at providing a holistic view to describe the mechanisms

shaping the use of smartphones. The exploration of relationships among the factors which were identified in research question 2 revealed that the use of smartphones for travel grounded from the use of smartphones in everyday context. The use of smartphones in everyday context influenced the use of smartphones for travel through transformational and spillover effects. On one hand, the previously mentioned changes in everyday experience due to adopting smartphones indicate that travelers have transformed methods of communication and informational consumption. That is, with the companionship of smartphones in everyday context, people have become accustomed to remaining connected with others through a variety of channels such as messaging services, email, and social networks (*MoreConnected\_Life*); people have become dependent on smartphones' serving as secretaries to provide constant informational support (*InfoAccessTool*); and people gained fondness for learning technology (*TechSavvy*). As such, when these people become travelers, they prefer to use smartphones to stay connected with others (travel communication), to acquire as much information support as possible (travel information search), and to explore new applications to assist planning and experiencing travel (travel facilitation and travel information search).

On the other hand, with the use of smartphones in everyday context, people developed new routines or habits such as checking email/Facebook regularly (routines), playing games on smartphones to avoid boredom (*UseOfDownTime*), or to photograph regularly to record anything interesting to share (*NewBehavior and Habits*). In travel, people may continue these routines or habits with them to check emails/Facebook (travel communication), play games (travel entertainment), and take and share photos (travel entertainment). As described in Chapter 5, the use of smartphones for information

searches during travel are more likely to associate with the use of smartphones for information search in everyday context through the transformational effect. The use of smartphones for entertainment during travel are more likely to associate with the use of smartphones for entertainment in everyday context through the spillover effect. Both transformational and spillover effects may influence the use of smartphones for communication and facilitation during travel.

Additionally, smartphones enabled changes in everyday context that may be sources for evoking extrinsic and intrinsic motivations during travel. For example, in terms of extrinsic motivations, people became accustomed to maintaining connections with others through a variety of communicative channels. Such “connected life” is the source for motivating travelers to “*KeepConnected/Informed*” during trips. In one cases, Informant #24 reported text messaging families during trips to maintain connection with children and share experiences with them. Text messaging was the main channel for connecting with children in everyday life, and resulted in greater communication and connected with those family members. In terms of intrinsic motivations, the experience of Informant #22 is an example of searching for information for everything during trips. However, this informant did not think that such informational searching was necessary because it infringed on the feeling of adventure. In response to a question of why then engage in searches, the informant mentioned being accustom to informational support from smartphones in everyday context. Using the smart phone had become “second nature” in preparation for an activity.

The identifications on the associations of the use of smartphones in everyday context and the use of smartphones for travel as well as travelers’ motivations to use

smartphones enable the integration of factors identified in the contexts of everyday experience and travel. As such, the mechanisms shaping the use of smartphones for travel can be described as following. The use of smartphones in everyday context provide a basis for the use of smartphones for travel. The changes in communication, information consumption, and life-style in everyday context after adopting smartphones appear to explain the influence of the use of smartphones in everyday context on the use of smartphones for travel. The actual use of smartphones for travel seems to occur from the influence of several contextual factors (evoking travelers' motivations), travelers' cognitive beliefs towards the effectiveness of smartphones, and some situational facilitators (e.g. no computer access). Furthermore, the outcomes of smartphones' use for travel may influence the use of smartphones in the future. The next section reexamines the conceptual framework of mechanisms shaping the use of smartphones for travel, described in Chapter 4 (Figure 8), to establish a strong theoretical foundation for a series of specific propositions.

## **6.2 A Theoretical Model for the Use of Smartphone for Travel**

This section discusses the emergent framework (Figure 8) in association with previous literature and relevant theories. Such reflections with theoretical foundations lead to a theoretical framework describing mechanisms shaping the different uses of smartphones for travel. This section first conceptualizes the seven elements in the emergent framework based on previous theories and the findings of this study. Such conceptualization defined the concepts in the theoretical framework. Then, the relationships between the concepts (i.e. three sub-processes, the relationship between the

use of smartphones and travel experience) are discussed to develop theoretical propositions. Integration of existing theories with the findings of this study directed development of these propositions, and as such, the anchor of the proposed framework is the relevant literature, but enriched by an understanding of the actual use of smartphones in everyday life and travel.

### *6.2.1 Conceptualization of the Elements in the Emergent Framework*

For the seven elements identified from the interviews with informants, some of them are the reflections of theoretical constructs which have been well defined in previous literatures. For example, the factors directly influencing the use of smartphones for travel (i.e. extrinsic and intrinsic motivations, four cognitive beliefs, and situational and personal facilitators) and travel experience have been defined as following: 1) extrinsic motivation is defined as the instrument perceptions towards performing activity to achieve valued outcomes that are distinct from the activity itself such as improved job performance. (Davis et al. 1992, p. 1112); and intrinsic motivation is defined as the perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se. (Davis et al. 1992, p. 1112); 2) Convenience/Ease of use is defined as the degree to which a person believes that using a particular system would be free of effort (Davis 1989, p. 320); Usefulness is defined as The degree to which a person believes that using a particular system would enhance his or her job performance (Davis 1989, p. 320); Trust is defined as the belief that allows consumers to willingly become vulnerable to Web information providers after having taken providers' characteristics into consideration. (Pavlou, 2003, p. 103); and social

norm is 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 (Fishbein & Ajzen, 1975, p.302); 3) Facilitators are objective factors in the environment that observers agree make an act easy to accomplish (Thompson, 1991); and 4) travel experience refers to an integration of the planning activities for the activities in the specific geographic environment, the performative action that is contextualized in the specific geographic environment, and the interpretations and sensations toward the activities and people in the specific geographic environment as well as the environment itself (Craig-Smith & French, 1994; Tussyadiah & Zach, 2011; Volo, 2009).

However, the theoretical support for the other three elements (i.e. the use of smartphones in everyday context, the use of smartphones for travel, and the changes in everyday experience) in the emergent framework was identified to be limited in that few efforts of conceptualization in previous literatures. For example, in terms of the use of smartphones for travel, previous studies (e.g. Wang, Park, Fesenmaier, 2011; Wang & Xiang, 2012) suggest that travelers mainly used smartphones to prepare itineraries, register reservations, search information, navigation, track flights, and create and share photographs. The uses of smartphones for facilitating trips and information searching were the focus of previous studies. These studies indicated that the impact of smartphones on travel experience come from the uses of smartphones for facilitation and information search in the context of travel. However, informants in this study also reported the use for communications and entertainment in the context of travel. This study identified that using smartphones for communication and entertainment are important for travel, because these activities influenced travelers' interpretations toward

trips and sensations during travel. For example, informants reported that constant connections with their families through text messaging created a sense of security. Also, informants reported that they felt trips to be more fun because they could avoid boredom by using smartphones to listen to music or play games. The use of smartphones for communication and entertainment may not relate to the trips that travelers were undertaking, but these activities indeed influenced the travel experience. Therefore, this study argues that the use of smartphones for travel should refer to all kinds of uses of smartphones in terms of the functions and applications in the context of travel. Similarly, the use of smartphones in everyday context is defined as all kinds of uses of smartphones in terms of the functions and applications in everyday experience.

Additionally, a smartphone is an innovation that was widely adopted recently in the society. As such, only a few studies were identified to date on the impact of smartphones on different aspects of people's lives. For example, several conference proceedings (Camargo, et al., 2011; Vogel, et al., 2007) explored the impact of hand held mobile devices on people's learning process and undergraduate education program. Their studies identified that smartphones can facilitate self-directed learning and as such enhance the learning outcomes. Some studies focused on the impact of smartphone healthcare-related apps on healthcare and public health interventions (e.g. Boulos, Weeler, Tavares, & Jones, 2011; Kaplan, 2006; Lindquist, et al., 2008). These studies identified the effects of smartphones on supporting telemedicine and remote healthcare in developing countries. A limited number of studies (total two industry reports and two referred journal papers) were identified on the impact of smartphones on communication, information consumption, and lifestyle. The industry reports described the impact of

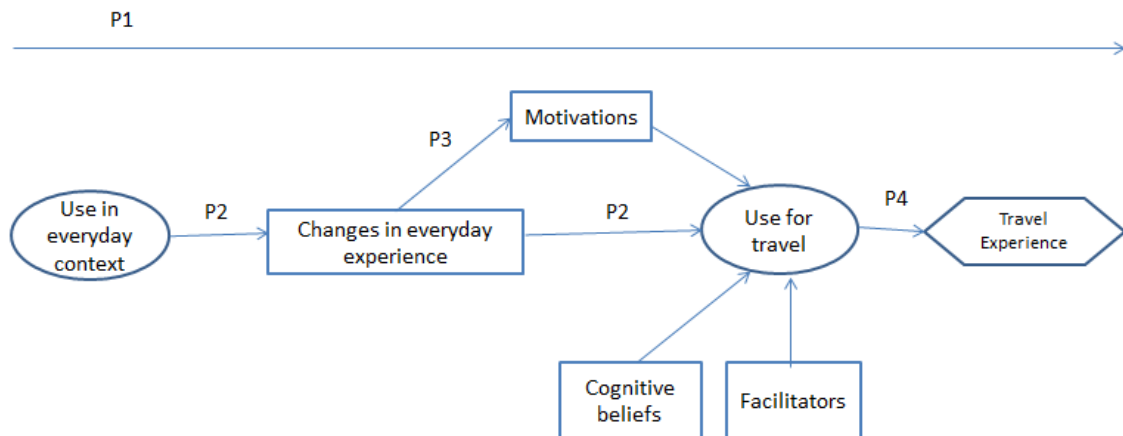
smartphones on teenagers' text messaging behavior (PewInternet, 2012) and the consumption of mobile media (comScore, 2012). These reports described that use of smartphones substantially increased the use of texting as a way of communication between teenagers and the consumption of entertainment context such as music, movies, and games on the mobile Internet. Studies have identified the differences of the Internet usage behavior (e.g. search results ranking effects, user content generation) in mobile platform versus in PC-based Internet (Ghose & Han, 2011).

This study identified seven changes in everyday experience after the adoption of smartphones. Some of these changes, such as taking smartphones as information access tools, using smartphones to fill downtimes, and using smartphones as an extension of desktop computers, are consistent with the findings in previous studies about the information consumption on mobile Internet platform (Ghose & Han, 2011). Further, this study identified more changes in everyday experience such as the ways of communication (e.g. less phones, more texting messages and social network communication, or increased connections with family and friends), lifestyle (e.g. new habits or routines, more technology learning), and the changes of the use of other devices such as MP3 player, GPS, etc. Therefore, in this study, the changes in everyday experience are defined as changes in people's communication, information consumption, uses of digital devices, and lifestyle due to the adoption and use of smartphones.

### *6.2.2 Propositions*

As presented in Figure 13, the bases for this theoretical framework are four propositions. Proposition 1 outlines the framework by describing the process of the

evolution of the use of smartphones for travel. This is an appropriation process involving learning, adjusting, and experiencing the use of smartphones during travel depending on the conditions established in the contexts of everyday life and travel. The proposition 1 illustrates the overarching process shaping the use of smartphones for travel. Proposition 2 and 3 articulate the three sub-processes connected the contexts of everyday experience and travel. The focus of Proposition 2 is the influence of everyday uses of smartphones on people’s everyday experience and travelers’ use of smartphones. Such influence is one of the reasons explaining the various uses of smartphones for travel. The proposition 3 is developed based on the theories regarding the sources of motivations, which provide the theoretical justification on the association of the changes in everyday experience and motivations in the context of travel. Finally, proposition 4 describes the impacts of different uses of smartphones on travel experience. These impacts transform the experience by changes to planning, the value and quality of travel, and travelers’ attitudes towards trips. The next sections discussed each proposition.



**Figure 13. Use of Smartphones for Travel: A Theoretical Framework**

### *A Process Perspective of the Determinants in Using Smartphones for Travel*

This study identifies that the use of smartphones for travel are shaped by not only the factors identified in the theories regarding the factors influencing the adoption and use of technology, but also the factors from the context other than travel. Further, this study suggests that the use of smartphones for travel is an outcome of a process involving the interactions among these factors rather than simply the sum of the impacts of a variety of factors.

On the one hand, the findings of this study keep consistent with several theories (i.e. Technology Acceptance Model, Motivational Model, Model of PC Utilization, and User Gratification Theory) regarding the factors influencing the adoption and use of technology. This study identifies that perceived ease of use, perceived usefulness, social norms, and trust were the cognitive beliefs driving the use of smartphones for travel. This finding confirms the generality of the technology acceptance model (Davis, 1989; Venkatesh & Davis, 2000). This study also confirms the motivational model (Davis *et al.*, 1992) in that extrinsic and intrinsic motivations are fundamental reasons for travelers' using smartphones. In addition, the findings of this study support the user and gratification theories (Starfford, Starfford, & Schkade, 2004) in that the informants reported that using of smartphones were to access online informational resources (content gratification), to satisfy routines or habits (process gratification), and to accomplish communication and social activities (social gratification).

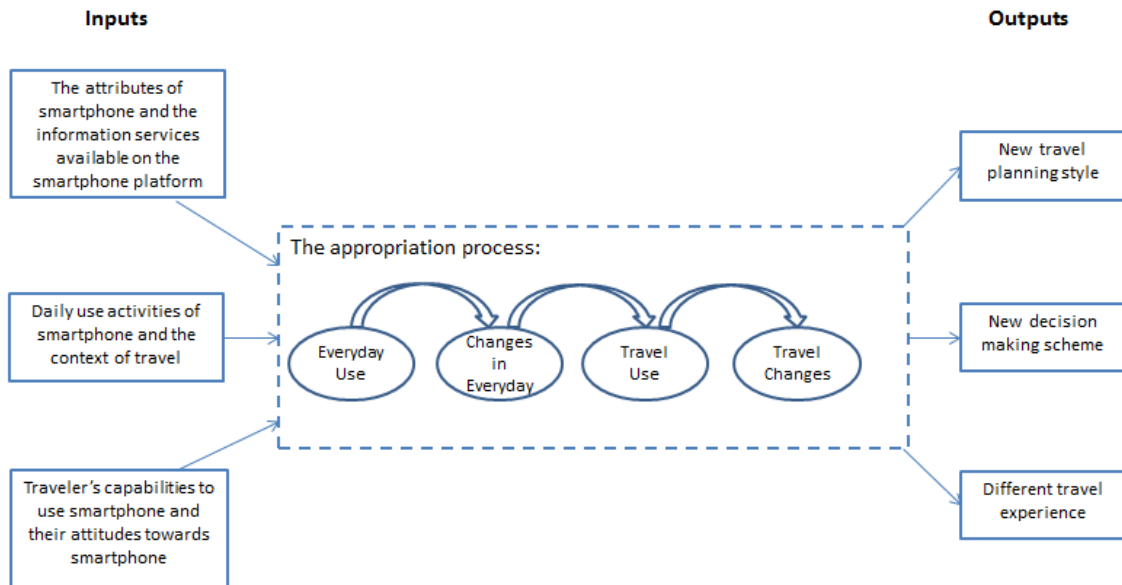
Besides confirmation, the findings of this study indicate the roles of each of factor in influencing the adoption and use of smartphones in the context of travel. Previous studies identified twenty main factors (Venkatesh, Morris, Davis, & Davis, 2003)

influencing individual's acceptance of technology. One of the common purposes of these studies was to identify the generic reasons to explain the variances in adopting and using technology. Deemphasizing the context of technology acceptance resulted in the long list and tedious empirical examinations (Benbasat & Barki, 2007). The current study explores the factors influencing the use of smartphones within specific circumstances described by travelers. As such, this study identifies the roles of each factor in the context of travel. The extrinsic and intrinsic motivations appear to be the fundamental reasons prompting travelers to use smartphones. The cognitive beliefs and other facilitating factors are, apparently, secondary factors driving travelers to use smartphones. That is, the extrinsic and intrinsic motivations are necessary but insufficient conditions for using smartphones for travel, while the cognitive beliefs and other facilitators are sufficient but not necessary conditions, because travelers would not use smartphones if they have no informational needs.

On the other hand, this research extends a stream of study regarding the adoption and use of technology in the context of organizations to the context of individual travelers. DeSanctis and Poole (1994) proposed that the impact of technology depends on not only its adoption but more importantly on the appropriation process of technology after the adoption. They defined the appropriation of technology as an ongoing practice, whereby people interact with technology and then actively select structures of use from a large set of possibilities. DeSanctis and Poole identified three sets of input factors influencing the appropriation process: structure of advanced information technology (i.e. GDSS in their study), structures established by tasks or organizational environment, and a group's internal system (e.g. existing styles of interacting). In the process, people select the

features that are appropriate for tasks and themselves, and identify a pattern of use of the technology for the long term. The output factors of the appropriation process are new social structures (interactional styles), new decision processes, and different decision outcomes.

The findings of the current study present an example of the process of appropriation (Figure 14) of technological use in the context of individuals, rather than within an organizational context. The input factors of the process of appropriation process of smartphones for travel include: 1) attributes of smartphones and the information services available on smartphones; 2) everyday use of smartphones and the context of travel such as first visit or revisit, types of destinations, length of travel; 3) traveler's capabilities for using smartphones and attitudes toward smartphones. The process of appropriation process begins with a process of adopting and adjusting use of attributes and information services from smartphones. Then, the use of smartphones in everyday context changes people's methods of communication, information consumption and perceptions toward the capabilities of smartphones as an ICT tool. The findings of this study suggest that the "transformation effect" and "spillover effect," which link the use of smartphones in everyday context, changes in everyday experience, and use of smartphones for travel. Under the influences of the transformational effect and spillover effect, travelers use the features and information services of smartphones (which they learned in their everyday lives) whenever the use is appropriate within the specific circumstances. Finally, the travelers change their travel planning, perceptions, and attitudes toward travel. The output factors in this process are new travel planning styles, new decision making schemes, and different travel experiences.



**Figure 14. Process of Appropriation Shaping Use of Smartphones for Travel**

The integration of the above arguments leads to a proposition illustrating the mechanisms shaping the use of smartphones for travel:

***Proposition 1:***

***The use of smartphones for travel is an outcome of a process of appropriation, which begins with a traveler's everyday experience, evolves with the use of smartphones in everyday context, is directly determined by contextual factors during trips, and ends with the changed travel experience setting up the conditions for the future use of smartphones.***

***Factors Influencing the Use of Smartphones from Other Contexts***

The findings of this study keep consistent with the notion that factors from other contexts, associated with the focal context, influence the adoption and use of technology in a particular context (Cooper & Zmud, 1990; Jasperson, Cater, & Zmud, 2005; Kwan & Zmud, 1987; Saga & Zmud, 1994). Previous studies identified that the factors at the

organizational level, such as manager's attitude, managerial enforcement, or confirmation of previous performance influenced an individual's acceptance of technology (e.g. individuals' cognitions) (Jasperson, Cater, & Zmud, 2005). The findings of the current research suggest that the use of smartphones for travel associate with the use of smartphones in travelers' everyday experience through the processes of spillover and transformation. These findings contribute to the argument supporting the distinctiveness of everyday life and travel experience (Larsen, Urry, & Axhausen, 2006; Uriely, 2005) by providing evidence from aspects of ICT and travel. The findings of this study regarding the association of use in both everyday experience and travel confirm that travel experience is not isolated from the everyday context and shaped by only the contextual factors in trips, while travelers' lifestyle, routines, and habits are important factors shaping the travel experience. These arguments form the basis for the proposition:

***Proposition 2:***

***The use of smartphones for travel originates from the use of smartphones in travelers' everyday lives and the changes to life after adopting smartphones.***

*The Changes in Everyday Experience and the Motivations to Use Smartphones for Travel*

The study provided evidence that the changes in everyday experience were associated with the motivations encouraging the use of smartphones in the context of travel. The theories regarding motivations and the sources of motivation provided theoretical support for such relationship. For example, self-determination theory (Deci & Ryan, 1985), which identifies several distinct types of motivation and the consequences for learning, performance, and well-being, and articulates the principals on the

development and sustainment of each type of motivation, identified three basic psychological needs for motivations: the needs for competence, relatedness, and autonomy. In the self-determination theory, the needs are “innate, organismic necessities rather than acquired motives” which “specify innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being” (Deci & Ryan, 2000, p. 229). The needs for competence refer to “feeling effective in one’s action, that is, experiencing opportunities to exercise, expand and express one’s capacities” (Deci & Ryan, 2000, p. 231). The needs for relatedness refer to “the desire to feel connected to others—to love and care, and to be loved and cared for” (Deci & Ryan, 2000, p. 231). The needs for autonomy refer to “volition—the organismic desire to self-organize experience and behavior and to have activity be concordant with one’s integrated sense of self”. (Deci & Ryan, 2000, p. 231). The self-determination argued that the three basic psychological needs, different from the goals and other superficial needs such as information needs, are the fundamental sources to motivate people to act because these are the nature of humans (Deci & Ryan, 2000).

The changes in everyday experience enhance the above basic needs such as competence and relatedness. For example, the study indicated that smartphones have become information access tools in everyday context. People would like to use smartphones to access to online information channels because they perceived the effectiveness of such use in helping them make better decisions and avoid risks. As such, people felt effective in using smartphones for information search and decision making. In the context of travel, the needs for competence motivated people to use smartphones to search information to help decisions on restaurants, accommodations, activities etc. Also,

this study indicated that the use of smartphones increased the intensity of connections between informants and their families and friends. As such, informants have desire to be connected with others during trips. Additionally, the use of smartphones developed routines and habits and the involved behaviors have become one's integrated sense of self. Thus, during trips, the autonomous travelers were motivated to perform these behaviors such as using smartphones to listen to music, read news.

Based on the above discussion, the following proposition is developed:

***Proposition 3:***

***The changes in everyday experience after the adoption of smartphones influence the use of smartphones for travel by influencing travelers' motivation in the context of travel.***

*Use of Smartphones for Travel and the Travel Experience*

The findings of this study and the discussion of these findings with previous literature regarding the nature of travel suggested that the use of smartphones for travel transformed travel experience.

First, the findings of this study are consistent with the theories regarding travelers' informational needs (Vogt & Fesenmaier, 1998; Cho & Jang, 2008), travel consumption system (Inskip, 1991; Leiper, 1990; Woodside & Dubelaar, 2002), and travel decision-making processes (Decrop, 1999; Decrop & Snelders, 2005; Hyde, 2004; Jeng & Fesenmaier, 2002; Sirakaya & Woodside, 2005; Woodside & MacDonald, 1994) through the examination of the use of ICT tools (i.e. smartphones) for travel. The use of smartphones for travel (i.e. communications, entertainment, facilitation, and informational searches) confirmed that travelers have a variety of information needs

before and during travel. They not only need information to achieve what they want to do, but also to explore what they can do at destinations. These are the functional and innovation information needs identified by Vogt and Fesenmaier (1998) and verified by Cho and Jang (2008). Also, travelers need information for utilitarian purposes, entertainment, and communication. These are the hedonic and social information needs (Vogt & Fesenmaier, 1998).

Second, the findings of this study confirmed that travel is a consumption system (Woodside & Dubelaar, 2002), and features of the decision-making process for travel features multidimensionality, sequentiality, and contingency (Jeng & Fesenmaier, 2002). The informants' descriptions of their travel experiences demonstrate that need to plans for a variety of elements such as transportation, accommodations, food, attractions, etc. Informants reported that planning for travel was a complex process and many aspects required decision after arriving at a destination, and the reality of situations always changed. As such, they needed to make travel-related decisions before and during trips. Informants reported that smartphones assisted substantially. On one hand, smartphones can access any online informational resources allowing travelers to use smartphones for the needed information. On the other hand, ever-available Internet access provided by smartphones supports travelers' decision-making almost anytime and anywhere with convenient and easy use. As such, travelers use smartphones to assist decision-making before and during trips. Therefore, smartphones have become an effective tool for satisfying travelers' informational needs and providing assistance for travelers' decision-making.

Third, the findings of this study also are consistent with the conclusions of

previous studies regarding the outcomes from use of smartphones for travel. Informants in this study reported that they became more flexible and more likely to change their plans during trips with the use of smartphones, because smartphones allow access to information for decision-making anytime. This is also the conclusion from studies by Kramer, Modsching, Hagen and Gretzel (2007) and Wang, Park, and Fesenmaier (2011). The current study also verified travelers' developing sensations during their trips, such as the feelings of confidence and security (Wang, Park, & Fesenmaier, 2011).

Furthermore, this study identifies many other influences on the travel experience. This study shows that use of smartphones enabled travelers to do less preparation before a trip, increased the efficiency of travel planning, and increased the frequency of travel. Previous studies have not articulated these impacts. Also, this study identifies that smartphones allow travelers perceive improvement in the travel experience, because they can have more information about all aspects, obtain special pricing for attractions, shows, and accommodations, and entertain themselves during transitional time. Thus, travelers changed their overall attitudes toward travel and highlighted the positive aspects of travel (e.g. fun, relaxation, etc.) and minimize negative aspects (e.g. risks, stress, tedious planning etc.).

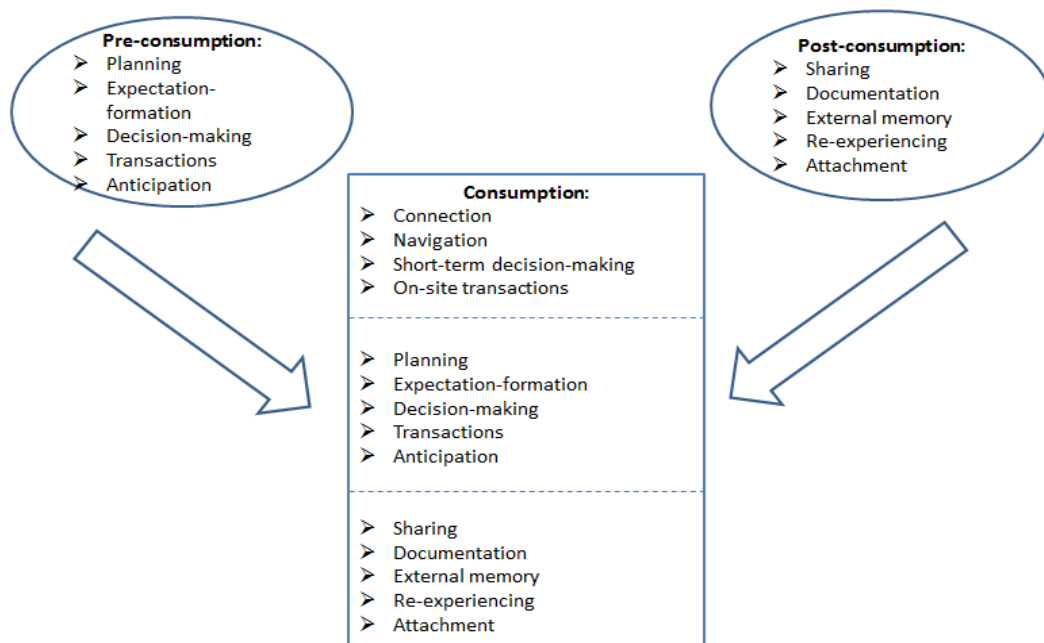
In addition, the findings of this research provide new insights into the transformation of travel experiences with use of ICT. Gretzel, Fesenmaier, and O'Leary (2006) discussed the integration of ICT within the classic model of travel experience (i.e., pre-consumption, consumption, and post-consumption), which assumed travel planning was part of the stage of pre-consumption and experience sharing was part of the stage of post-consumption. They presented applications of ICT tools, such as Internet, GPS,

digital camera, handheld video recorder, etc. performed travel related tasks in each stage of the travel experience. As such, Gretzel, Fesenmaier, and O’Leary argued that ICT transformed travel experiences by providing more information, improving the quality of decision-making, increasing efficiency, and extending travel experience with documentation and sharing.

The findings of this research suggest that besides the advantages ICT brought to travel, the use of smartphones transformed travel experiences by unlocking a three-stage model for the travel experience. That is, the tasks that travelers do in the pre-consumption and post-consumption stages now occur in the consumption stage with the assistance of smartphones. For example, this study identifies that use of smartphones changed travel activities. Travelers are more likely to plan less before travel because they know that they can access online information sources anytime during trips to reserve hotel accommodations, select restaurants, or find directions. Also, travelers are more likely to change their plans if they are unsatisfied with the original plan or cannot execute the plan. As such, travelers are more likely to initiate on-site decision-making, and smartphones are usually the only information tool they can use during trips. In addition, this study identifies that travelers are more likely to document and share their experiences during trips because of the convenience of smartphones and the instant happiness from online social activities. Informants reported not engaging in follow-up activities after trips because they have shared the experience through smartphones during trips. Thus, the activities featured in the post-consumption stage of travel experience have moved to the consumption stage.

As demonstrated in Figure 15, the use of smartphones unlocks the three-stage

model of travel experience by shortening or eliminating the pre-consumption and post-consumption stages and extending the consumption stage. Such transformation brought by the smartphones may lead to results which fundamentally change travelers' experiences. First, travel activities may become more spontaneous; unplanned trips are a pre-condition of spontaneous activities. Second, the scheme of travel decision-making may change, because input information for on-site travel decision-making is different from pre-trip decision-making. Third, the feedback from others regarding travel experiences move to the consumption stage, which may influence travelers' activities and emotions. Therefore, the use of smartphones for travel transform the travel experience by changing travel planning, travel decision-making, and sharing travel experiences.



**Figure 15. Use of Smartphones and Transformation of the Travel Experience**

The previous discussion illustrates the roles of smartphones for travel and the impact of smartphones' use on travel experiences. These discussions, lead to proposal of the proposition:

**Proposition 4:**

*All uses of smartphones influence the travel experience, and these activities transform the travel experience by changing pre-trip travel planning behavior, en-route behavior, travelers' sensations, and travelers' interpretations toward travel.*

**6.3 Chapter Summary**

This study's design promotes examination phenomena as described by an informant (#22):

*"I realized that upon my travels since Jan 2011, I had a few conversations with new acquaintances about my travels while I was unemployed. I recall seeing these people with smart phones and telling them how I was able to achieve worldly travels without a job. I explained to them that sites like travelzoo was a big factor in finding affordable airfare and that I'd buy the ticket and figure out the rest of the details when I got to my destination.*

*Overall, I feel smart phone carriers are in it more for the social standing than the actual use that it can be, i.e. alternative to a laptop. I find older generations with a smart phone and only use it to call or text someone, if they found the love of texting, which many have not. There are even younger generations, people born before 1989 who do the exact same thing. And when they travel, especially overseas, they leave their mobile at home. Which makes me think that they aren't smart phone savvy and their use has not affected their way of traveling at all."*

This description indicates curiosity for questions, such as, "Why I know how to use a smartphone to get deals but others don't?" "Why are people different in terms of their uses of smartphones for travel?" or "Are there any associations between the use of smartphones in everyday life and during travel?" Only understanding these questions leads to the understanding the essence of such phenomena (i.e. uses of smartphones for

travel).

This research answered these questions by developing a theoretical framework to describe the mechanisms shaping the different uses of smartphones for travel. The discussions of the findings of this research with relevant literature result in four propositions. The first proposition relates to the processes shaping the use of smartphones for travel. The second proposition concerns the association of smartphones' use in contexts of both everyday experience and travel. The third proposition concerns the association of the changes in everyday experience due to the adoption of smartphones and the motivations encouraging the use of smartphones in the context of travel. The fourth proposition concerns the use of smartphones for travel and the impact of such use on the travel experience. Arguably, these propositions provide the necessary foundation for a theoretical framework describing the use of smartphones for travel.

In fact, the above description from Informant #22 represents comments after reading the preliminary findings of this research. The findings of this research were a reminder of the phenomena previously noticed. Such reflection indicates that the framework developed by this study explains the potential questions that Informant #22 might ask when noticing the phenomena. Therefore, this study achieves the proposed goal of study in that a framework describing the mechanisms shaping the use of smartphones for travel arises from the informants' descriptions, anchored in the relevant theories and literature, and reconfirmed in the reality. The next chapter is an overview of this research as a conclusion and illustrates the study's major limitations to warrant the contributions of this research. In addition, closing remarks discuss managerial implications and suggestions for future research.

## **CHAPTER 7. IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH**

The previous chapter discusses the results of the study with the goal of proposing a theoretical framework to describe the mechanisms shaping the use of smartphones for travel. This chapter considers the theoretical and managerial implications of the study followed by limitations leading to a series of recommendations of future research and ends with closing remarks.

### **7.1 Theoretical Implications**

This study describes mechanisms shaping the use of smartphones for travel and develops a theoretical framework illustrating a system in which the adoption and the use of smartphones in everyday context lead to a different travel experience. The findings and theoretical discussions indicate that the studies on travel and technology should be considered in the system of tourism consumption (Woodside & Dubelaar, 2002), rather than only the cognitive beliefs toward the ICT tools. This system view provides an explanation for the fundamental needs and motivations that encourage travelers to use technology in the context of travel. Also, this system explains the outcome of technology use. The system of tourism consumption includes several stages including planning, purchasing, and consuming and is across different domains of people's lives such as everyday context and the context of travel. These stages are not necessarily sequential (Jeng & Fesenamier, 2002) and everyday experience influences travel experience (Larsen, Urry, & Axhausen, 2006). Within the system of tourism consumption, the adoption and use of technology are mainly purpose-driven (i.e. an optimal travel experience) and based on the background of people in terms of the use of ICT. For example, this study identified

that travelers used smartphones in the context of travel to search for information, look for deals, and find directions because their optimal travel experience depend on the satisfaction of these information needs. Furthermore, these uses of smartphones in the context of travel originate from the use of smartphones in everyday experience. Travelers learnt and got used to have smartphones to perform these tasks for acquiring information in their everyday lives. Therefore, the system of tourism consumption provided a rich context to consider the factors influencing the use of technology in the context of travel. Within this system, there are three sub-systems shaping the use of technology in the context of travel, which can be understood from the following three 'views'.

First, the findings of this study suggest an interactive view for studies of technology and travel. This study identified that the use of smartphones for travel are shaped by the interactions of a variety of factors. For example, within the context of travel, travelers' extrinsic and intrinsic motivations motivated them to require the use of information communication technology or digital devices to satisfy their needs. However, these motivations did not guarantee their use of smartphones because of the availability of many alternatives. The use of smartphones in the specific circumstances of travel depended on the traveler, who had a specific needs at the moment, and their cognitive beliefs toward the effectiveness of smartphones in satisfying their needs. As such, the use of smartphones for travel is the outcome from the composition of forces generating by motivations and cognitive beliefs. Also, this study identified that people's experience with the information sources accessed from the desktop or laptop computer interacted with the cognitive beliefs toward the effectiveness of smartphones as information access tools to lead to the use of smartphones in the context of travel. The informants reported

that they would like to use the Yelp smartphone app to find restaurants because they used Yelp.com on their desktop computer and they felt that the Yelp app can even serve better for their needs due to the portability of smartphones. Additionally, this study identified that the interaction between the use of smartphones in everyday context and the use of smartphones in the context of travel. Travelers acquired the skills and knowledge of smartphone use in their everyday experience with smartphones, and their use of smartphones in the context of travel were reflections of their everyday use experience. Overall, this study indicates that the adoption and use of technology in the context of travel are influenced by a variety of factors. These factors are not independent from each other and they interact to shape travelers' behavior. Therefore, in the studies of technology and travel, identifying the factors associated with the use of technology is important as well as understanding the interactions among the factors which shape the use of technology for travel.

Second, this study suggests a development view for the study of technology and travel. The development view refers to two dimensions. The first dimension refers to the development in travelers' use of technology. This study indicates that the impact of technology on travelers and the tourism industry not only depends on the adoption of technology, but is more important on the use of technology. This study identified that the use of smartphones for travel is shaped in an appropriation process whereby people learn and adjust their use of smartphones in their everyday lives and such use influences the use of smartphones in the context of travel. In particular, the American travelers indicated that they kept learning and adopting new apps and adjusting the use of their smartphones in both contexts of everyday lives and travel. Some informants mentioned

that they were adopting more and more information services on the smartphones comparing the time when they just adopted smartphones. These changes encourage their use of smartphones in the context of travel. Also, this study identified that the current use of smartphones in the trips are the origins of the use of smartphones in future trips and the bases of the future travel experience. For example, some informants reported that they had a great experience with smartphones because they enjoyed the flexibility during trips without the sacrifice of the quality of decisions. That is, the travelers made better decisions on-site according to their needs without the restraints of pre-trip planning. As such, travelers intend to take advantages of smartphones to acquire more flexibility in the future trips and make better decisions according the specific conditions. The findings of this study suggest that the impact of technology on travel is not static and it develops with the adaptively use of technology by each individual. The adoption of technology only indicates the beginning the potential use as well as the initiation of the possible influences. Therefore, a development view should be adopted to guide the studies of technology and travel. That is, the investigation on the impact of technology on travelers should go beyond the stage of adoption to examine the longitudinal effect with the development of traveler's use. The other dimension of the development view refers to effects caused by the development of technology. The dramatically changing landscape of information technology is another force encouraging a development view. Some informants indicated that they kept learning new apps because they had benefited from the existing apps and they believed that the continuous learning about the smartphone technology could bring them more benefits. As such, the fast changing technology in terms of both hardware and

software can 'update' the impact of technology on tourism. Therefore, a development view is appropriate in order to capture the dynamism of technology and travel.

Third, this study suggests a dialectic view for the studies of technology and travel. The findings of this study indicate that smartphones were internalized into people's lives in different ways which led to different travel experiences. For example, informants reported that they increased their connections with their families and friends because of the increased use of text messages and social networks after the adoption of smartphones. Such changes enriched their travel experience. Also, the informants reported that they increased their dependence on the online information sources after the adoption of smartphones because of the ubiquitous access of the Internet. This change urged them to conduct more information search with smartphones whenever they needed to make decisions during trips. However, this study also identified that there were diversities among individuals in terms of the internalization of smartphones in their lives. This finding suggests the existence of the resistant forces for the internalization of smartphones. That is, the positive experience with smartphone for some people may be negative with others. The internalization of smartphones in people's lives and travel experiences is the outcome of the negotiation of positive and negative impacts. This study was limited to the factors leading to the use of smartphones, but not the factors associating with the resistances of the use of smartphones, which has been recognized as one of the limitations of this study. Also, this study focused on the positive impacts of the use of smartphones for travel rather than the negative impacts. However, the differences in terms of the use of smartphones for travel and the changes of travel experience indicate

their importance and therefore, a dialectic view of technology and travel should enable us to better understand how these processes are “negotiated.”

## **7.2 Managerial Implications**

This goal of this dissertation was to develop a conceptual framework describing the use of smartphones for travel. However, the results of this study offer several managerial implications in the areas of mobile marketing, destination marketing and management, and the design of travel information services on the smartphones platform, most notably in the area of mobile marketing. The Mobile Marketing Association (MMA) is “a set of practices that enable organizations to communicate and engage with their audience in an interactive and relevant manner through any mobile device or network.” (MMA, 2009). With the development of mobile technologies, common acceptance places mobile marketing in the “future of marketing” because of its ability to allow computing a more pervasive, realistic, and influential technology in people’s lives (Okazaki, 2012). Ubiquity, the usage of flexibility of time and location (Okazaki, 2012), has gained the reputation of being a key concepts in mobile marketing, because instantly and almost universal availability of interactivity enables consumers wide latitude of control over what they see, read, and hear (Barnes, 2002).

The findings of this study confirm the power of ubiquitous interaction. For example, people accomplish pre-trip planning anytime they desire: while waiting for bus, waiting in the line at the grocery checkout, and wherever: in restaurants, tennis courts, or a train stations. This indicates the importance of making travel products or destination information available on the smartphones. People can also initialize the decision-making process anytime during trips to respond to unexpected situations or dissatisfaction with

original plans. This indicates the importance of location-based services (LBSs) which “provide specific, targeted geospatial information about users’ surrounding environment, their proximity to other entities in space (such as people and places), and/or distant entities (e.g. next stops during trips)” (Okazaki, 2012, p.121). For example, smartphones’ application “Yelp,” as a location-based service, has wide use for locating restaurants.

Ubiquitous interaction also strengthens the impact of social media in that the findings of this study indicate that travelers rely on social media to make onsite decisions. In this study, the informants reported to rely on social media to make decisions on restaurants, the dishes to order, hotels, and car rental companies when they were in destinations. Also, the informants revealed tendency to share their experience through different channels online with their smartphones immediately after they experienced something. These findings suggest new opportunities to encourage contributions on the platform of social media about tourism businesses. For example, restaurants might consider designing rewards to encourage onsite experience sharing through smartphones. However, travelers might lose the impulse to contribute to social media about their experience after trips. As such, there is a tension between somehow incentivizing consumer reviews and losing the appeal and sincerity of ‘natural’ contributions to the community.

The findings of study also suggest the importance of the construction of intelligent systems within the mobile platform for destination marketing/management organizations (DMOs). Intelligent system refers to “fully autonomous travel counselors or concierges that have the ability to determine user preferences and anticipate user needs while having a large and at the same time specialized knowledge repository at their

fingertips and continuously evaluate their suggestions based on feedback received from their users” (Gretzel, 2011, p.760). This study indicates that smartphones and associated networks and applications have the potential to be turned into intelligent systems that build upon location and traveler response data. And, this study indicates that travelers would be likely to reply on such systems because they are used to using smartphones as a tool to access information and seek for help before and during trips. The construction of an intelligent destination marketing system requires not only strong technological support, but the integration of local tourism resources and tourism businesses (Staab & Werthner, 2002; Venturini & Ricci, 2006). Therefore, DMOs should lead in the development of intelligent mobile systems because they have the resources and the capability of coordinating local businesses.

Finally, the findings of this study provide insight into the design of travel information services on mobile platforms. For example, the results of this study indicate that it is important to consider the context in which travel products and services are needed, and the way that smartphones apps can help. Also, this study indicates that travelers would like to do less planning before trip and move lot of their decisions to the stage when they are at the destination. If tourism businesses want travelers to support loyalty programs which encourage more future consumption, it is important to integrate location-based services and push alert functions into the apps supporting the loyalty programs.

### **7.3 Limitations**

Several important limitations of this dissertation must be acknowledged. Some of limitations originate from the qualitative research paradigm that was used to conduct this study. First, though the qualitative nature of this study has helped generate concepts related to the use of smartphones for travel and to identify the different factors shaping different use of smartphones for travel, the attempts to generalize the results to a diverse population may be overly simplistic. The findings of this study are based on the conversations with twenty-four American travelers and as such, they cannot be used to represent the population of American travelers. Second, this study provided limited insights for the measurement of the identified concepts. Though quantification is important for the confirmation of a theoretical framework, this study focused on the identification of the concepts and the relationships consisting of the framework which are the necessary steps before the measurement issue. Therefore, more effort is required in order to quantitatively measure the constructs described in the theoretical framework. Third, the interpretations are wholly subjective, and thus require caution. The subjectivity of this research is acknowledged and relevant strategies such as member check, the check of inter-coder reliability were applied to avoid bias.

Also, some of limitations originate from the scope and the design of this study. Although the following aspects are not the interests of study, it is important to acknowledge the roles of these dimensions for a comprehensive understanding of the focal phenomenon. First, this study focused on the current use of smartphones in everyday lives and travel. However, the current use of smartphones is the outcome of previous use and antecedents of future use. Therefore in the understanding of the

mechanisms shaping the use of smartphones for travel, the use of smartphones in other time periods is important. Second, this study focused on the factors driving the use of smartphones. However, the dialectic worldview suggests that the opposite side of the phenomenon, which is the non-use of smartphones or the resistances of some functions of smartphones, is also critical for a comprehensive understanding of the phenomenon. As such, this study is limited in providing insights on the restraints of the use of smartphones and the negative impacts of the use of smartphones on travel.

#### **7.4 Suggestions for Future Research**

However, despite these basic limitations, it is argued that this study provides a sound theoretical foundation describing the use of mobile technology and travel; as such, it hoped that it provides a guideline for future research in the area of mobile technology and travel, and useful implications for mobile marketing and mobile travel information service design. A number of studies are recommended with this research as a starting point. First, this study was essentially exploratory in that it sought to identify a theoretical framework including the concepts and process in which the use of smartphones for travel is shaped. Based on the concepts emerging from travelers' descriptions, measurement items for variables of the changes in people's everyday experience due to the adoption and use of smartphones and the changes of travel experience should be developed and tested. Variables representing the motivations and cognitive beliefs can be adapted from previous literatures regarding the adoption and use of technology (e.g. Venkatesh, et al., 2003). Further, the causal relationships among these variables should be tested to measure the effectiveness of this theoretical framework in interpreting the focal phenomenon in population.

Second, this study indicates the several differences exist in how travelers use smartphones as well as the factors shaping the use of smartphones. Considering the different impacts from different use of smartphones on travel planning and travel experience, it is important to explore the variance of the use of smartphones in population, and understand the sources of such variance. The understanding of the differences among population in terms of the use of smartphones for travel as well as in everyday lives might indicate the new criteria of market segmentation. The studies about the market segmentation based on the use of online travel planning (e.g. Susskind, Bonn, & Dev, 2003) have suggested the effectiveness of these new market segmentations in predicting travelers' behavior and consumption.

Third, this study identified that the process shaping the use of smartphones for travel is an appropriation process in which people learn, adjust, change, and assimilate the functions and information services that they use with smartphones after their adoption of smartphones. This appropriation process across the contexts of everyday experience and travel covers two secondary-level appropriation processes. In the context of everyday lives, people appropriate smartphones to fit their needs and lifestyles. Such appropriation changes people in the ways of communication, information consumption, and even lifestyle. In the context of travel, conditioned by their use of smartphones in their everyday lives and their changes, people appropriate smartphones to fit their needs emerging from travel. Such use in travel changes their travel planning and travel experience which may influence people's use of smartphones for travel in the future. This finding suggests the dialectic relationship between technology and users (Castells, 2003) in which the development of technology is internalized into people's lives and people's

changes in lives accelerate mobile technology innovations. Such dialectic relationship between technology and users is important for the understanding of the dialectic relationship between technology and society (Orlikowski, 1992). Therefore, a longitudinal research design should be adopted to explore the evolutions of the use of smartphones in people's everyday lives as well as the changes due to the use of smartphones. Further, the longitudinal perspective should be applied to study the evolutions of the use of smartphones for travel and the changes of travel experience. Last, the longitudinal perspective will also provide the insights on the interactions between the two appropriation processes in the contexts of everyday life and travel.

Fourth, the findings of this study suggest a strong connection between people's everyday experience and their travel experience. This study verifies that travel is a "special stage" for technology use, and everyday uses of technology influence the use of technology while traveling (Gretzel, 2011; MacKay & Vogt, 2012; White & White, 2007). As such, many elements in people's everyday lives such as interpersonal relationships, social networks, routines and habits are brought to the context of travel. While some studies have identified the impacts of these elements from everyday lives on travel experience (Currie, 1997; Ryan, 2003; White & White, 2006; Vogt & McKay, 2012), future studies should examine the portion of everyday life that is moved to the context of travel by the use of smartphones and its impact on the travel experience.

Fifth, this study identified how the use of smartphones changes people's uses of "down time" such as the time waiting in a line or the time on a bus. This study found that people used these down times to search for travel ideas, check for travel deals, monitor flight prices, and even make hotel reservations and purchase tickets of shows. These

findings suggest that pre-trip planning is becoming more fragmented, more extended (due to more chances of information search), and the channels for pre-trip planning might be changing. Building upon previous studies (e.g. Fodness & Murray, 1998; Snepenger & Snepenger, 1993) that have suggested that the extensiveness of information search and different use of information sources could influence travel decision-making process and travel products consumption, future studies should explore the impact of smartphones on pre-trip planning from these two perspectives.

Sixth, the results of this study suggests that the use of smartphones unlocked the three-stage travel experience and moved many pre-trips decisions to the stage of “during trips”. This change in timing and context suggests that the information environment will substantially influence the decision-making process (e.g. Bettman, Luce, & Payne, 1998; Engel, Blackwell, & Miniard, 1986). Also, the time pressure and limitations of smartphones in facilitating information search (e.g. small screen, inconvenient words typing) might influence the on-site decision making process (Wang & Xiang, 2012). Therefore, this study recommends that future studies focus specifically on the en-route (or in-destination) decision-making process.

Finally, this study found that the online information channels (i.e. websites) that people used on desktop or laptop computers for travel planning were then used with their smartphones for travel. For example, many informants reported that they used Expedia or Priceline apps on their smartphones to check for travel deals and flight information because these were the main channels for travel planning before they adopted smartphones. The findings suggest that the use of smartphones for travel is not independent from other settings of technology uses (Gretzel, 2010). With the increasing

penetration of information technology in people's lives, the longitudinal effects of Internet uses should be considered in the studies of mobile technology and travel (e.g. Jennings & Zeitner, 2003). Therefore, future studies should examine the relationship between desktop/laptop Internet use and the use of smartphones. Importantly, such studies may also contribute to the understanding of the dialectic relationships between information technology and society.

## **7.5 Closing Remarks**

Smartphones as a fully functioning computer with ubiquitous Internet connection has demonstrated great potential to transform the travel experience (Wang & Xiang, 2012). However, the existing literature provides a limited understanding of the factors influencing the use of smartphones for travel. In particular, the theories regarding the adoption and use of general information communication technology in travel appear to ignore many important contextual factors in travel (Gretzel, 2011). Indeed, a review of the literature related to ICT, travelers' information needs, travel planning, travel experience, and the adoption and use of technology suggests that an integration is needed to provide a comprehensive understanding of the essence of the phenomenon. As such, the goal of this study is to develop a theoretical framework describing the mechanisms shaping of the use of smartphones for travel. In order to achieve this goal, this study explored the following three research questions:

- (1) What are the use of smartphones in the context of travel?*
- (2) What are the factors influencing the use of smartphones in the context of travel?*
- (3) What are the mechanisms shaping the use of smartphones for travel? (i.e. How are the factors working to shape the use of smartphones in the context of travel?)*

A phenomenology approach was used to conduct this study in order to eliminate pre-judgments and pre-suppositions to explore the nature of the use of smartphones in travel including its antecedents (i.e. the factors influencing such use), process (i.e. the use activities), and outcomes (i.e. the impact of such use). The implementation of this research approach resulted in extremely rich descriptions of the use activities of smartphones, the factors influencing these use activities, and the processes in which the use of smartphones are shaped. The informants (twenty four American travelers) revealed that they used smartphones far more than mobile phones with basic functions. Four categories of use activities of smartphones for travel (including 25 unique activities) were identified from the informants and include the use activities of smartphones for communication, entertainment, facilitation, and information search for travel. For example, besides phone calls, the informants reported using smartphones to send emails and do text message through mobile messengers or social network such as Facebook. The informants also used smartphones for entertainment such as listen to music, read news, and play games. Besides being an entertainer, smartphones are a good “assistant” or “secretary” for travel because it helped informants to find directions, remember the itineraries, track flight, and purchase tickets in trips. Last, but not least, smartphones are a handy tool for information search. The informants used smartphones to search a variety of information such as restaurants, attractions, hotels etc. through either search engines or smartphones apps. In summary, smartphones for informants is an agglomeration of multiple digital devices and a portable computer with ubiquitous Internet access.

The informants identified five sets of factors that are associated with travel and everyday life. Three sets of factors that directly lead travelers to use smartphones in

travel are travelers' motivations to use smartphones as a tool to achieve some purposes, their cognitive beliefs toward the use of smartphones, and other situational facilitators (e.g. no computer access) that lead the informants to use smartphones rather than any other alternative ways. Travelers' extrinsic and intrinsic motivations are the fundamental reasons for travelers to require an ICT tool to help them in travel. For example, travelers may need to find directions, restaurants, or accommodations during trips. They may also need to look for local deals after they get to the destinations or stay connected with family and friends. Cognitive beliefs and other facilitators lead travelers to choose smartphones other than alternative ways to fulfill their needs, which are the origins of extrinsic and intrinsic motivations.

Besides the three sets of direct factors, travelers indicated that the current use of smartphones changed their travel planning and travel experience. For example, they are more likely to make fewer plans than before prior their trips, they felt less stressful and more secure during trips. The impacts of smartphone use were identified as another set of factors influencing the use of smartphones for travel. In addition, the everyday use activities of smartphones are identified to be highly similar with the use activities of smartphones for travel. Travelers indicated that the use of smartphones in everyday life changed their ways of communication, their ways of information consumption, and even lifestyle, and these changes enabled the spillover of everyday use activities of smartphones to travel and the different use of smartphones for travel. Thus, everyday use of smartphones and the changes brought to people's lives are important indirect factors influencing the use of smartphones for travel.

This study also identified the mechanisms that shape the use of smartphones for travel and are described in Figure 8. As shown, the use activities of smartphones for travel are “encouraged” by the extrinsic and intrinsic motivations rising from the context of travel, but the activities originate from the use of smartphones in everyday life. That is, the everyday use of smartphones changes the way we communicate with others and the way we consume information. These changes lead to the use activities of smartphones for travel through the processes of spillover and transformation. For example, some everyday use activities such as checking emails and read news with smartphones “spill over” into the context of travel due to routines or habits, while the intrinsic motivations to perform activities such as checking emails and read news during trips originate from these routines or habits in everyday life. Also, some everyday use activities of smartphones such as information search indirectly encourage the use of smartphones for information search in travel by increasing people’s dependency on smartphones for accessing information and transforming people’s perceptions towards travel planning and trips. As such, travelers may need more information support during trips due to limited planning before trips, which are the extrinsic motivations encourage the use of smartphones for information search for travel. The cognitive beliefs and other facilitators lead travelers to choose smartphones other than alternative tools to fulfill their needs. Finally, the framework includes the impact of use of smartphones for travel on travel planning and travel experience where the positive impacts strengthen the likely use of smartphones in future trips.

The proposed framework is anchored in and integrates the literature streams of travel information needs, travel planning, travel experience and the adoption and use of

technology and identifies the relevant concepts affecting use of smartphones for travel including its antecedents, process, and outcomes. Importantly, the framework outlines the mechanisms in which the use activities of smartphones for travel are shaped by travelers' everyday use of smartphones, travelers' background of IT use and smartphones use, the contextual factors of travel, and the perceived impacts of smartphones use on travel planning and travel experience. The theoretical framework also identifies three sets of relationships – those between the everyday use of smartphones and the use of smartphones for travel, between the contextual factors for travel and the use activities of smartphones for travel, and between the impact of smartphones use on travel planning and travel experience and the use of smartphones for travel. Thus it is argued that from a phenomenological perspective, this study provides a comprehensive understanding of the mechanisms that shape the use smartphones for travel.

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## **APPENDICES**

**APPENDIX A**  
**INTERVIEW CONSENT FORM**

## **Consent Form (Interview)**

### **Mechanisms Shaping the Use of Smartphones for travel**

Principal Investigator: Daniel Fesenmaier School of Tourism and Hospitality  
Management

Co-investigator: Dan Wang School of Tourism and Hospitality Management

#### **Investigator's Statement**

The researchers at Temple University in Philadelphia, PA are conducting a study to understand the impact of smartphones such as smartphones, iPad on mobility and travel experience. Participation in the study involves the completion a 30 to 50 minutes telephone interview. In the interview, you will be asked to respond to statements and questions about the use of smartphoiness, the factors motivating you to use your mobile device for travel, and the impact of such use on your travel experience. Your responses will be recorded with an audio recorder and transcribed into text for further analysis. Your participation in this research is voluntary. You may refuse to participate, discontinue participation, or skip any questions you don't wish to answer at any time without penalty or loss of the benefits to which you are otherwise entitled.

By completing the interview (i.e. 30 to 50 minutes telephone conversation without interruption), you will receive \$30 dollars. If you have any questions or concerns, please do not hesitate to contact Dan Wang, Speakman Hall 393, 1810 North 13th street, Philadelphia, PA 19122, (215) 204-5612 or at *dan.wang@temple.edu*.

#### **Participant's Statement:**

My participation in this study is on voluntary basis, and I may refuse to participate at any time without consequence or prejudice. I understand that if I participate in the interview, the interview process will be audio recorded for later research purpose.

Although the study team has placed safeguards to maintain the confidentiality of my personal information, there is always a potential risk of an unpermitted disclosure. To that degree, all documents and information pertaining to this research study will be kept confidential, unless required by applicable federal, state, and local laws and regulations to

be disclosed. I understand the records and data generated by the study may be reviewed by Temple University and its agents, the study and compliance with regulations. I understand that the results of this study may be published. If any data is published, I will not be identified by name.

If I have any questions my rights as a research subject, I may contact the Institutional Review Board (IRB) Coordinator at (215) 707-3390; [irb@temple.edu](mailto:irb@temple.edu) or via regular mail:

Institutional Review Board Coordinator

Temple University Research Administration

Student Faculty Conference Center

3340 North Broad Street - Suite 304, Philadelphia, PA 19140 USA.

Participant's Signature:

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Date:

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Investigator's Signature

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Please fill out the following table for the interview date and time you prefer:

*(Please select 2 time slots that are convenient for you; and indicate your preference with typing “best” and “second” in the cell)*

	Sun 6/3	Mon 6/4	Tue 6/5	Wed 6/6	Thu 6/7	Fri 6/8	Sat 6/9
9:00 am							
10:00 am							
11:00 am							
12:00 am							
1:00 pm							
2:00 pm							
3:00 pm							
4:00 pm							
5:00 pm							
6:00 pm							
7:00 pm							
8:00 pm							

Please indicate how you would like to receive the interview call

*(Please type “X” to choose):*

\_\_\_\_\_ I would like to receive the interview call from telephone at ( ) \_\_\_\_\_-

\_\_\_\_\_ I would like to receive the interview call from Skype at \_\_\_\_\_

(please fill your Skype account name)

**APPENDIX B**  
**PROFILES OF INFORMANTS**

Profiles of Informants

No.	Gender	Age Group	Smartphone Use Profile
1	F	18-30	iPhone, 2 years
2	F	18-30	iPhone, 1.5 years
3	F	18-30	Blackberry, 2 years
4	M	18-30	iPhone, 1 year
5	F	18-30	iPhone, 2 years
6	F	51-60	Motorola, 2 years
7	F	61-70	HTC, less than 1 year
8	M	41-50	iPhone, 3 months
9	F	18-30	Samsung, 3 months
10	M	18-30	Motorola, 1.5 years
11	M	51-60	HTC, 1 year
12	M	51-60	iPhone, 7 months
13	F	31-40	HTC, 2 years
14	M	18-30	Samsung, 8 months
15	M	18-30	Blackberry, 2 years
16	M	61-70	iPhone, 7 months
17	F	51-60	Samsung, less than 1 year
18	F	51-60	LG, 7 months
19	M	41-50	Motorola, 1 year
20	M	18-30	HTC, 8 months
21	M	31-40	HTC, 2 years
22	F	18-30	Samsung, 9 months
23	M	18-30	Nokia, 1.5 years
24	M	61-70	iPhone, 1 year

*Note: 1. Informants #1 to #5 participated in pilot test.*

*2. Informants #8, #9, #11, #15, #18, #19, #22 participated in the follow-up interview*

**APPENDIX C**  
**SCREENING SURVEY OF INFORMANTS**

**The Use of Mobile Device by American Travelers Telephone Interview Invitation  
Survey (Screening survey for informants)**

Q1 Consent Form

The Use of Mobile Device by American Travelers

Investigator's Statement

The researchers at Temple University in Philadelphia, PA are conducting a study to understand the impact of smartphones on mobility and travel experience. You are invited to complete a 5 minutes survey to see if you are qualified for a compensated telephone interview. If you are qualified, you will be contacted by researcher to make an appointment for a 30 to 50 minutes telephone interview. In the interview, you will be asked to respond to statements and questions about the use of smartphones, the factors motivating you to use your mobile device for travel, and the impact of such use on your travel experience. Your responses will be recorded with an audio recorder and transcribed into text for further analysis. Your participation in this research is voluntary. You may refuse to participate, discontinue participation, or skip any questions you don't wish to answer at any time without penalty or loss of the benefits to which you are otherwise entitled. By completing the interview, you will receive \$30 dollars. If you have any questions or concerns, please do not hesitate to contact Dan Wang, Speakman Hall 393, 1810 North 13th street, Philadelphia, PA 19122, (215) 204-5612 or at dan.wang@temple.edu.

Participant's Statement:

My participation in this study is on voluntary basis, and I may refuse to participate at any time without consequence or prejudice. I understand that if I participate in the interview, the interview process will be audio recorded for later research purpose. Although the study team has placed safeguards to maintain the confidentiality of my personal information, there is always a potential risk of an unpermitted disclosure. To that degree, all documents and information pertaining to this research study will be kept confidential, unless required by applicable federal, state, and local laws and regulations to be disclosed. I understand the records and data generated by the study may be reviewed by Temple University and its agents, the study and compliance with regulations. I understand that the results of this study may be published. If any data is published, I will not be identified by name. If I have any questions my rights as a research subject, I may contact the Institutional Review Board (IRB) Coordinator at (215) 707-3390; irb@temple.edu or via regular mail:

Institutional Review Board Coordinator Temple University Research Administration  
Student Faculty Conference Center 3340 North Broad Street - Suite 304, Philadelphia,  
PA 19140 USA.

I certify that I am 18 years of age or older, have read this form, and volunteer to participate in this research study.

Please  $\checkmark$  if you agree to participate in the survey, and then click Next button below. (1)

If Please  $\checkmark$  if you agree... Is Not Selected, Then Skip To End of Block

Q2 Thank you in advance for taking a moment to participate in our study.

Now, please take several minutes to complete the screening survey for telephone interview. We will contact you soon to arrange telephone interview if you are qualified. To navigate through the registration process, please use the "Previous Page" and "Next Page" buttons only. Please do not use the back and forward buttons from your browser.

Q3 First, in order to check your qualification for the telephone interview, we would like to know about your use of mobile device(s) including smartphone and tablet computer, and your travel experience. During the past 12 months (May 31, 2011- May 30, 2012), how many pleasure, vacation or personal trips that were at least 50 miles, ONE WAY away from home, and that included an overnight stay have you taken? (Please select one response)

- None (1)
- 0-2 (2)
- above 3 (3)

If above 3 Is Not Selected, Then Skip To End of Block

Q4 During the past three months (March 1, 2012 - May 30, 2012), did you have at least one trip that was at least 50 miles, ONE WAY away from home, within United States, and that included an overnight stay have you taken?(Please select one response)

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q6 Currently, do you own and use any of the following mobile device(s)? (Please select all that apply)

- Smartphone (the mobile phone using any of the following operating systems: Apple iOS (e.g. iPhone), Android (e.g. HTC Hero, Nexus One, Galaxy Nexus), or RIM (e.g. Blackberry) (1)
- Tablet computer (e.g. iPad, Galaxy Tab) (2)

Q7 How long have you owned your mobile device(s)? (Please select a response for each device)

Q8 For your mobile device(s), what kind(s) of data plan for Internet access are you using? (Please select one response)

- Limited data plan(s) (1)
- I don't know (2)
- Unlimited data plan(s) (4)

Q9 How many applications (apps) do you currently have installed on your mobile device? (Please select a response for each item)

	None (1)	1 to 10 (2)	10 to 20 (3)	20 to 30 (4)	More than 30 (5)
Free (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 What kinds of apps do you have on your mobile device(s)? (Please select all that apply)

- News and weather (e.g. NY Times, USA Today) (1)
- Business & Productivity (e.g. Document To Go, CamCard, iSchedule) (2)
- Finance (e.g. Stockquotes, Chase Mobile, Mortgage Calculator) (3)
- Photography (e.g. Instagram, PicSay) (4)
- Education (e.g. Math Bingo, Vocabulary trainer) (5)
- Entertainment (e.g. TV, comics, Talking Tom Cat) (6)
- Social networking (e.g. Facebook, Twitter) (7)
- Games (e.g. Angry Birds, Fruit Ninja) (8)
- Health & Fitness (e.g. My Tracks, Calorie Counter) (9)
- Lifestyle (e.g. Bartender, Receipts Book) (10)
- Medical (e.g. iPharmacy, Medscape) (11)

- Music & Audio (e.g. Pandora) (12)
- Navigation & Transportation (e.g. MapQuest, Subway Schdeules) (13)
- Communication (e.g. Gmail, eBuddy Messenger) (14)
- Travel (e.g. Tripadvisor, TripIt, Yelp) (15)
- Books (e.g. iBook, Kindle) (16)
- Shopping (e.g. Coupons, Amazon.com) (17)
- Others (18) \_\_\_\_\_

Q11 Congratulations, you are qualified to participate in our study. Please complete the following contact information (i.e. email address, contact phone number) and demographic information. We will contact you soon to arrange telephone interview. What is your email address?

Q12 What is your contact number?

Q13 Please indicate the best time to call you for the confirmation of interview.

- 9:00am to noon (1)
- Noon to 5:00pm (2)
- 5:00pm to 9:00pm (3)
- Other, please specify (4) \_\_\_\_\_

Q14 Demographics Gender:

- Male (1)
- Female (2)

Q15 Which age group are you belong to?

- 18 - 30 (1)
- 31 - 40 (2)
- 41 - 50 (3)
- 51 - 60 (4)
- 61 - 70 (5)
- above 71 (6)

**APPENDIX D**  
**SAMPLE OF CODING**

Category	Code	Coding from Informant #15
Everyday use activities	D_Email	Then I wake up and I check all my messages, which is my Outlook. This is a business phone in outlook which I check if I have any messages from my – I have an offshore team working on it so I get e-mails from them so I check the messages early in the morning to see if they need anything.
	D_Facebook	During lunchtime I have this habit of using my Facebook to see if my friends have posted anything on the wallpaper.  I don't use my Facebook when I'm at work. So I use it when I'm having my little breaks
	D_News	Sure. I can help. The first thing I work for a <u>_IT_</u> company, so I'm pretty much running on the run, so I don't have time to catch up on the news. I check live news. I usually don't have time to check on the T.V. so I do it on the smart phone when I'm in the car.
	D_PlayGame	During the lunchtime. I mostly do it in the lunchtime and my wife uses my phone to play the games. And over the weekend if I don't have anything on the T.V. coming up I use play games on the smart phone, because I don't have a gaming console. So the smart phone is the only place that I play games.
	D_Navigation	I use my navigation app if I'm trying to go to a different location or I have a <u>_GPS_</u>
	D_Alarm	The first thing I wake up, I use the smart phone for my alarm. I use it for my alarm.
	D_Stock	And during the final meetings I usually use the trading app which I use to check my stock holds if I need to sell anything or buy anything. I have an alert set for stock price reaches say \$20. It sends me an alert, but I go and buy or sell. So that's one thing I keep checking. It's something I do on a everyday basis. It's like two, three times a week. So that's about stock.
	D_GenInfosearch	I use it for search I want to get movie tickets or things like that over the weekend. So I kind of do a search when I'm in the car and I'm trying to pull from where I search for movies and movie tickets.

Changes in everyday experience	Extension/Replace ICTTools	<p>So things that I would have did, things that I would have never afforded to do when I had a regular phone before the smart phone, I use only for texting and calling.</p> <p>Number one is my news feed. It's not a big thing, but I guess I'm really interested in the politics and in the sports and those kinds of news. And trust me how I'm in my meeting, my first meeting of the day starts at around 8:00 and it goes on until 10:30. So by the time I come out of the meetings, these ___ because I have an offshore team, so that's the situation back in ___. So they get update at the end of their day and whenever they're done.</p> <p>having on my strong market prices. So that's number three</p> <p>When the phone, which was not a smartphone, my regular phone, the only thing I used to do is all up people and know what's going on with them or either text message. After that there was absolutely nothing I was using my phone for. But right now, I have converted my uses of many things which I do on a laptop, at least to 20 to 30 percent onto my smartphone. Which I can do on the go now, which I was never able to do before.</p> <p>Sure. You see when I started using my smartphone, my first smartphone, I only used to do 10 to 15 percent of my things on smartphone and only when I did not have access to my laptop. Right? Things went on and after four years with the smartphone now, even if I'm having access with my laptop, I'm so used to the keypad and the quick functions which I can do on my smartphone. I guess 30 to 40 percent of things I'm doing on my smartphone, even though I have access to my laptop. So that's a big change in my behavior.</p>
	NewBehavior	<p>I check live news. I usually don't have time to check on the T.V. so I do it on the smart phone when I'm in the car.</p>
		<p>So things that I would have did, things that I would</p>

	<p>have never afforded to do when I had a regular phone before the smart phone, I use only for texting and calling. And everything I needed on the run I could never get to them. I mean right now I could walk around talking about, I keep on here, because in a day of mine and my work time I spend at least four to five hours in a meeting. When I'm in a meeting, if I'm getting an alert on something. I cannot react when I didn't have a smart phone.</p>
UseOfDownTime	<p>During the lunchtime. I mostly do it in the lunchtime and my wife uses my phone to play the games.</p>
InfoAccessTool	<p>Now you know I could do it quickly. I could come out of the meeting room for a few minutes and finish it off on my phone. It's absolutely a big plus. If you ask me what would you do if the smart phone is not with you for the next ten days, I don't have an answer. I'm so set on it. There's a big entertainment for me, because it initially just started with the __ phone because when I bought it I never realized what all I can do with a smart phone. I think you understand how things have changed or all you could do with a smart phone. Smart phone is very reliable even four years back. The number of things you can do on a smart phone have drastically increased in the last couple of years.</p> <p>I use it for search I want to get movie tickets or things like that over the weekend. So I kind of do a search when I'm in the car and I'm trying to pull from where I search for movies and movie tickets. [Inaudible] you know? I stopped using – I use of my laptop has decreased a lot after my smart phone.</p>
Routines/Habits	<p>During lunchtime I have this habit of using my Facebook to see if my friends have posted anything on the wallpaper.</p> <p>The things which I do in common on a everyday basis and when I'm on a trip is posting pictures on Facebook on the run and checking any local deals, if possible.</p>
MoreConnected_	<p>It's not a big thing, but I guess I'm really interested</p>

	Life	<p>in the politics and in the sports and those kinds of news. And trust me how I'm in my meeting, my first meeting of the day starts at around 8:00 and it goes on until 10:30. So by the time I come out of the meetings, these __ because I have an offshore team, so that's the situation back in __. So they get update at the end of their day and whenever they're done.</p> <p>I want to make it more better. Because with my smartphone, I'm able to connect to more of my school friends, which I was missing earlier. When they send a message, I am able to respond to them immediately. But earlier it was not possible for me.</p>
Use of smartphones for travel	T_Facebook	<p>I took some personal photos of me and my wife and my sister back in India. Posted my picture on Facebook so she can see that we're having fun in Vegas. Not a classical picture, we just had personal pictures standing alongside of each other. I did picture with my phone only to post on Facebook. I usually don't trust my Blackberry to have very – pictures with good clarity. I just go by my camera.</p>
	T_Photo	<p>I took some personal photos of me and my wife and my sister back in India. Posted my picture on Facebook so she can see that we're having fun in Vegas. Not a classical picture, we just had personal pictures standing alongside of each other. I did picture with my phone only to post on Facebook. I usually don't trust my Blackberry to have very – pictures with good clarity. I just go by my camera.</p>
	T_Thingstodo	<p>Before going [Inaudible] last minute trip so we didn't plan for anything. But I was that was the one I booked as a Blue Man Group show, which I did not book through my mobile, but I checked for the availability and the timings of the Blue Man Group. That was on May 1st for a one week of a plan.</p> <p>this is later at this point in time we only got the tickets. And I booked it and that's done from there. But on May 1st we were in the tennis court. We were in the tennis court. So my friend was – some other friends were playing tennis with me and they wanted me to if we were going to Vegas, go to the Blue Man Group show. Instead of coming back to</p>

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home, open the laptop, my wife said why not check it right away. So it's in the tennis court we checked for the Blue Man Group tickets

Actually during the trip when I was in the flight I haven't checked for anything. But as soon as we landed in the airport we were waiting for a cab, then we checked – Googled Las Vegas attractions. Because it was – usually I don't use my smart phone this much, but the Vegas trip was like everything in the universe [Inaudible]. The Bronson trip I planned for my Bronson trip everything was sitting at home. So in Vegas, yeah, as soon as we landed in Las Vegas airport there was a huge rush to get a cab. So I had time to kill my time.

So I was trying to check if there was anything else or any other shows which I can visit. So I Googled Las Vegas attractions. It came up and told me what attractions I can attend. So just browsed. I did not book anything at that point of time. Just wanted to do what else can I do. Because my earlier two trips it was more – you know all the gambling stuff and I didn't see any shows. But this time it was – this time it was a family time. I couldn't gamble much. I couldn't go to any bars or \_\_\_. I had to look for shows, which I never did before.

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T\_Flight\_p

Yeah, sure, sure. Actually last time I booked my tickets through Allegiant Air and that I had checked in through my smart phone for the availability and all when I was sitting in the office. Because our plan was May 11th is my birthday. So it was an instant plan. We wanted – my wife wanted me to be in Vegas for my birthday. So my wife works in the same office, so April 25th or 26th when we signed in the office. So we were simply talking about making a plan. So we were in the cafeteria so I immediately just checked the date of Allegiant Air dates if there were any available tickets.

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T\_Deal\_d

I was searching on Group On. The Group On on Las Vegas. I guess I was in the start up of [Inaudible] to my friends for the ride and I was kind of fried so I didn't go for the ride. I was taking a \_\_\_

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		<p>because of them. So those rides are really scary. My wife and I didn't go. The other six people went for the ride on the helicopter ride. It was 42, 40 minutes to one hour which was too many people to take down. So then I was searching for cool deal, because my wife was looking at all the remaining helicopters which was doing the trips on Las Vegas, she wanted me to find if there is anything like a good rate and a good timing to do the trip on the Grand Canyon</p>
		<p>that was the Stratosphere. Me and my wife visited the Stratosphere and we had enough time, because we were not doing the ride. She was scared so I had to stay with her. And you know the view from Stratosphere is pretty awesome. You can see everything from Las Vegas when you're on the Stratosphere.</p>
		<p>So we took a photograph of the – the motivation factor for me we stood at the end of the Stratosphere so that when I'm taking my photo with my right hand it pulls the picture with the whole Las Vegas in the background. So that was the motivation I wanted to take a picture and send to my sister.</p>
Motivations	Social Fun	<p>I'm a newly married guy, so everything I spend with my wife, every moment – these not the little moment I treasure a lot. You don't – I work my wife works we both work and we're extremely busy in our everyday life. And we hardly get time to talk to each other. We hardly get time to go out to get a drink or something. So when we're getting time those are the little moments, the little pictures we take when we were at specific locations like Grand Canyon. And Stratosphere, we pose for those pictures. I mean I posted pictures from Grand Canyon too when we were doing the helicopter ride. So those are very precious. Those are things my sister cannot do when she's not here in America. I just posted her to know that we're really in the best place in the world Las Vegas.</p>
	Habit	<p>During lunchtime I have this habit of using my Facebook to see if my friends have posted anything</p>

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on the wallpaper.

The things which I do in common on a everyday basis and when I'm on a trip is posting pictures on Facebook on the run and checking any local deals, if possible.

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PlanTrip

I was trying to check if there was anything else or any other shows which I can visit. So I Googled Las Vegas attractions. It came up and told me what attractions I can attend. So just browsed. I did not book anything at that point of time. Just wanted to do what else can I do. Because my earlier two trips it was more – you know all the gambling stuff and I didn't see any shows. But this time it was – this time it was a family time. I couldn't gamble much. I couldn't go to any bars or \_\_. I had to look for shows, which I never did before.

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Transportation

Because our plan was May 11th is my birthday. So it was an instant plan. We wanted – my wife wanted me to be in Vegas for my birthday. So my wife works in the same office, so April 25th or 26th when we signed in the office. So we were simply talking about making a plan. So we were in the cafeteria so I immediately just checked the date of Allegiant Air dates if there were any available tickets.

So all of the people wanted me to check on the smart phone if there are tickets available to they can join me. And I told them that if there aren't any tickets available only me and my wife can go instead of all. But fortunately there were eight available. So they paid me through their little later but they asked me to book the tickets on their behalf. So I went ahead and booked tickets for eight people using my credit card at that point of time.

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BetterValue

But that was the initial one. So there was a find board outside the store, so we were already planning to go to hotel. I asked my friends to [Inaudible] on Group On and trust me we work for one for \$10. So if it was \$10 per person which was not possible only because I was searching with my smart phone. That's a straight \$75 I saved per

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		<p>person in a travel group of eight people. I saved \$500 just because I Googled before going into the store.</p> <p>And you know once you get into Vegas I don't think I'll ever be able to open a laptop. It's always busy. You keep running. You are running around to cover everything you want to see. The big things you want to see. It's never a time in Vegas when you stop and open up your laptop and do searches. In fact, we the eight to try not sleeping in those three days. So we just roaming around.</p> <p>I think that's one primary reason why I had to do things on the run. And my laptop. I cannot carry laptop? Vegas searching for stuff on the go. It has to be my smart phone. And fortunately my other friend has an iPhone so he was doing his stuff. I was doing my stuff. We were kind of leaning together his phone and my phone. We were trying to set up timings, because I only had to go for 10:00 in the Blue Man Group. Then it was an additional ___ for the David Copperfield so we had to do that together. All these difficult shows had to happen, when we were on the move. It's not just one or two people you can simply go and buy two tickets. But you had to buy tickets for eight people.</p> <p>To answer your question if I didn't have a smart phone I had to go back all the way to my hotel, open up my laptop and search for the deal. It saves a lot of time. It took us two to three hours to reach there to open up and do things. [Inaudible] to open up my smart phone type group on and simply type in Grand Canyon helicopter deal. It came up. Within three hours we started from there and went over the Grand Canyon.</p>
Situational and personal facilitators	NoPC	<p>Because our plan was May 11th is my birthday. So it was an instant plan. We wanted – my wife wanted me to be in Vegas for my birthday. So my wife works in the same office, so April 25th or 26th when we signed in the office. So we were simply talking about making a plan. So we were in the cafeteria so I immediately just checked the date of Allegiant Air dates if there were any available</p>

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tickets.

Because I was in the cafeteria and it was a break time for me and that's what I use things in which I can do on laptop, but I do it, because in the cafeteria we were like eight people sitting down together.

But on May 1st we were in the tennis court. We were in the tennis court. So my friend was – some other friends were playing tennis with me and they wanted me to if we were going to Vegas, go to the Blue Man Group show. Instead of coming back to home, open the laptop, my wife said why not check it right away. So it's in the tennis court we checked for the Blue Man Group tickets.

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The Group On is something I started using after Bronson. I never used before 2011, because we were in Florida when I used Group On after reaching Florida putting the local zip code. I did not find anything useful. All those days we were use the time in – some things we need, but there were many things I couldn't use anything. When it was in the Christmas weekend for the Florida trip.

PriorUse

But when we went to Bronson in the month of February, Group On gave me a good two good bills for restaurants. They gave me a 20 percent off on a couple of restaurants which we were interested in. So that's when I found out using Group On what I never used was a deal. That was my first time and in Vegas – I'm in Vegas yeah, that Grand Canyon ride was the only one I found. The other ones were expensive ones I couldn't afford.

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Changes of travel experience

TC\_LessFollowup (AfterTrip)

I mean exactly the moment we just talked about. Like I could take a picture, things that you could do in the next five minutes are those which give you a thrill. I mean if I'm taking a picture with my smart phone and I'm in Grand Canyon in a helicopter, come back home all the way after two days and then post a picture on Facebook. It gives the thrill. I wanted to share it immediately, because I'm happy at that moment. But by the time I reach home and then upload the photo in Facebook and then ask my

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sister to take a look, it take the thrill and by the time I got home I'm kind of tired after there big four or five day trip. It's very important to be able to update your social status or anything like news feed.

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We were talking about this when we were coming back end of flight. We were tacking about this. With this casino how did I save money using my phone rather than my laptop. So the deal which I got from Group On if I would have gone to the store there were five to six shops right around Stratosphere where I could take the helicopter trip. So there was [Inaudible] for the whole trip. But that was the initial one. So there was a find board outside the store, so we were already planning to go to hotel. I asked my friends to [Inaudible] on Group On and trust me we work for one for \$10. So if it was \$10 per person which was not possible only because I was searching with my smart phone. That's a straight \$75 I saved per person in a travel group of eight people. I saved \$500 just because I Googled before going into the store.

TC\_BetterValue

That's the case I think with the David Copperfield magic show. So there were a few deals left out, because when I was checking that [Inaudible] and then at the MGM Grand there are no seats available. It's already full. But I came back out of the MGM Grand was hanging around and then started searching it gave me 15 percent discount on the David Copperfield Show tickets. These are savings and I didn't know my travel group was big. I mean all we have four friends and all four friends bought [Inaudible] in the last one, two years. So it's like eight people multiplied by anything even if it is \$10 it's like \$80 for me at the group level. So that means a lot to me when saving a lot of money when using my smart phone. So I think that's a big difference for me.

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**APPENDIX E**  
**CODEBOOK**

**Code Book:****Set 1: Use of smartphones in everyday context**

<b>Category</b>	<b>Code name</b>	<b>Definition of code</b>
Communication (4 items)	D_Email	Send/Receive emails
	D_TextMsg	Send/Receive text messages
	D_facebook	Login Facebook to check posts or post
	D_Calls	Phone calls
Entertainment (7 items)	D_News	Read news
	D_PlayGame	Play games
	D_Music	Listen to music
	D_Twitter	Read news on twitter
	D_Photo	Take and share photos
	D_Movie	Watch movie
Facilitation (6 items)	D_Book	Read book
	D_Navigation	Navigation
	D_Weather	Check weather info
	D_Alarm	Use as alarm
	D_CalendarPlanner	Daily schedule
	D_Bank	Manage bank accounts
InfoSearch (4 items)	D_Stock	Manage stock deal account
	D_Shopping	Record & Price comparison
	D_Restaurants	Search for restaurants
	D_Infosearch	General info. search
	D_TravelIdeas	Search for travel deals/ideas

Note: Definitions for categories:

**Communication:** the use of smartphones for the activities aiming at communicating with others.

**Entertainment:** the use of smartphones for the activities aiming at self-entertainment.

**Facilitation:** the use of smartphones for the activities aiming at assisting tasks.

**InfoSearch:** the use of smartphones for the activities aiming at searching for information

**Code Book:****Set 2: The changes in everyday experience after the adoption of smartphones**

<b>Category</b>	<b>Code name</b>	<b>Definition of code</b>
EverydayChanges (7 items)	Extension/ReplaceICTTools	The use of smartphones to replace other devices completely such as GPS, MP3 Player, or the use of smartphones as a substitute of some devices such as desktop computer which are not accessible.
	NewBehavior	The emerge of some new behavior due to the adoption of smartphones, such as taking photos, listen to music, or text messages
	MoreConnected_Life	The increase of the communication with family, friends, and others through the increasing use of emails, text messages, and social networks.
	InfoAccessTool	The feelings about to rely on smartphone as a tool to access online information, or the behaviors to use smartphone to search for information
	Routines/Habits	The development of new routines or habits due to the use of smartphones such as taking photo regularly, checking email accounts every 20 minutes
	UseOfDownTime	The use of smartphone to fill down times
	TechSavvy	The feelings about technology and the tendency to learn more technology after the adoption of smartphones.

**Code Book:****Set 3: The use of smartphones for travel**

<b>Category</b>	<b>Code name</b>	<b>Definition of code</b>
Communication (4 items)	T_Calls	Phone calls
	T_Email	Send/Receive emails
	T_TextMsg	Send/Receive text messages
	T_Facebook	Login to Facebook
Entertainment (7 items)	T_Photo	Take photos
	T_Music	Listen to music
	T_Game	Play game
	T_Book	Read book
	T_InternetSurf	Surf on Internet
	T_News	Read news
	T_Movie	Watch movie
Facilitation (6 items)	T_Navigation_d	Navigation during trip
	T_Weather	Check weather info
	T_ItineraryMgt	Manage itinerary
	T_FlighttrackCheckin	Track or check in flight
	T_TktPurchase_p	Purchase ticket prior trip
	T_TktPurchase_d	Purchase ticket during trip
InfoSearch (8 items)	T_Restaurant	Search restaurant
	T_Thingstodo	Search activities
	T_Flight_p	Search Flight
	T_Hotel_d	Search hotel prior trip
	T_Twitter	Search info. from twitter
	T_Deal_d	Search deals during trip
	T_Hotel_p	Search hotels prior trip
	T_Deal_p	Search deals prior trip

Note: Definitions for categories:

**Communication:** the use of smartphones for the activities aiming at communicating with others during trips

**Entertainment:** the use of smartphones for the activities aiming at self-entertainment during trips

**Facilitation:** the use of smartphones for the activities aiming at assisting tasks during trips.

**InfoSearch:** the use of smartphones for the activities aiming at searching for information before (for preparation) and during trips

## Code Book

### Set 4: Motivations driving the use activities of smartphones for travel

Category	Code name	Definition of code
Extrinsic Motivation (12 items)	Social Fun	To seek for happiness from social activities
	KeepConnected/Informed	To get connected with family, friends, and others, and to stay informed about workplace and news in the society.
	Food	To find restaurants for meals
	KeepSafe	To stay away from risks
	PlanTrip	To plan trips
	Directions	To find directions
	Transportation	To find information for transportation arrangements
	Accommodation	To find information for accommodation
	Thingstodo	To find information about the things to do in destinations
	BetterValue	To seek for deals to add value to trips
	BeIsolated	To be temporarily isolated from travel companions
	Shows	To find information about the shows in trips
Intrinsic Motivation (2 items)	Habit	The use of smartphones to perform tasks for the sake of habits.
	KillTime	The use of smartphones to fill the down times

Note: Definitions for categories

***Extrinsic Motivations:*** The instrument perceptions towards performing activity to achieve valued outcomes that are distinct from the activity itself such as improved job performance. (Davis et al. 1992, p. 1112)

***Intrinsic Motivations:*** The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se. (Davis et al. 1992, p. 1112)

**Code Book:**

**Set 5: Cognitive beliefs towards the use of smartphones for travel**

<b>Category</b>	<b>Code name</b>	<b>Definition of code</b>
Cognitive Beliefs (4 items)	Convenience/ Ease of use	The degree to which a person believes that using a particular system would be free of effort (Davis 1989, p. 320).
	Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis 1989, p. 320)
	Trust	The belief that allows consumers to willingly become vulnerable to Web information providers after having taken providers' characteristics into consideration. (Pavlou, 2003, p. 103)
	Social norm	The person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975, p.302).

**Code Book:**

**Set 6: Situational and personal facilitators**

<b>Category</b>	<b>Code name</b>	<b>Definition of code</b>
Situational and personal facilitators (3 items)	NoPC	No computer access
	PCExperience	Use experience on websites
	PriorUse	Prior use experience with smartphones

**Code Book:**

**Set 7: Changes of travel experience**

<b>Category</b>	<b>Nodes</b>	<b>Changes</b>
Changes of travel activities (5 items)	TC_EasyPlan	Travel planning become easier because of simplicity and less planning;
	TC_MoreFlexible	The trips become more flexible if unexpected situations happen or the original plans are unsatisfying.
	TC_MoreInfoPlan	More planning before trips because of increased chances to search for information during down times
	TC_LessFollowup (AfterTrip)	Less follow up after trips because most of photos and experience have been shared during trips.
	TC_MoreTravel	Travelers would like to increase their number of trips because of easy planning and less risk
Changes of interpretations and sensations (7 items)	TC_MoreConnected	More connected with others
	TC_MoreInformative	More informative
	TC_BetterValue	Gaining better value of trips
	TC_MoreEntertain	More fun during trips
	TC_LessStressful	Travel is less stressful
	TC_MoreSecure	Travel is more secure
	TC_MoreConfident	More confident about travel

Note: Definitions for categories

***Changes of travel activities:*** travelers change their behaviors in pre-trip planning, en-route activities, and follow-up activities.

***Changes of interpretations and sensations towards trips:*** travelers change their interpretations and perceptions toward the trips they described.

**APPENDIX F**  
**SAMPLE OF RELATIONSHIP CODING**

Relationships Code	Coding from Informant #15
<p>Everyday use of Facebook – Everyday change of “MoreConnected_life”</p>	<p>I want to make it more better. Because with my smartphone, I’m able to connect to more of my school friends, which I was missing earlier. When they send a message, I am able to respond to them immediately. But earlier it was not possible for me.</p> <p>Yes. If somebody posts a message on my Facebook, earlier when I don’t have access with my smartphone to the internet, I have to come back home check it once in a while, maybe once in a day or at the end of the day. Because I don’t have access to Facebook in my laptop where I work. It’s restricted. So, I can access Facebook from my smartphone where I can update the status on likes and comments which one of my friends made. So, I’m making more likes and more comments and putting something _____ words more frequently than I used to do without a smartphone.</p> <p>I was saying that means when I didn’t have a smartphone, say I was responding to my friend’s comments once or twice in a day. Now I’m able to do at least five to ten times a day, which means more connection with my old friends from school.</p> <p>Absolutely. Friends are very important to me. In my part of my life, friends are really important to me. I was really not happy earlier that I was not able to respond to all their mails because I was busy at work. But right now I’m doing my work as is, I’m doing my job. Along with it, I’m also able to respond to my friends’ comments and all and keeping them happy. My relations with my friends have gone much better after I started using my smartphone. My answer is definitely yes.</p>
<p>Everyday change of “MoreConnected_life” – Travel use of Facebook</p>	<p>That’s true. Last time when I was posting pictures I got a lot of likes from my sister. And many of the friends have also seen those pictures. And they said, dude, have a good time. That’s</p>

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your birthday. People log onto their Facebook to wish me on my birthday. And they also liked all the photos, which I posted during the trip. I'm really enjoying the whole piece.

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Everyday use of information search – Everyday change of “Extension/ReplaceICT tools”

I use it for search I want to get movie tickets or things like that over the weekend. So I kind of do a search when I'm in the car and I'm trying to pull from where I search for movies and movie tickets. [Inaudible] you know? I stopped using – I use of my laptop has decreased a lot after my smart phone.

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Yes. Because my daily life, I just have a choice that I can have access to my laptop. You don't expect people to open laptops in Las Vegas casinos or anything.

To open and browse. It's not possible and it looks stupid. People would make fun of you when you're opening a laptop in a casino. I think that's the only option. I don't have any other option. If you ask that you're relying on a smartphone, I have to because I have no other option.

Everyday change of “Extension/ReplaceICT tools” – Travel use of information search

this is later at this point in time we only got the tickets. And I booked it and that's done from there. But on May 1st we were in the tennis court. We were in the tennis court. So my friend was – some other friends were playing tennis with me and they wanted me to if we were going to Vegas, go to the Blue Man Group show. Instead of coming back to home, open the laptop, my wife said why not check it right away. So it's in the tennis court we checked for the Blue Man Group tickets.

I would say too much difference. I had a lot of different things. You're a human being. You have this tendency you find something. You want to find something better. So during this what happens is when we find a deal we search more. We search more and more to see if there's anything better but anything much better price, we find anything on much more interesting. So I

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would say my usage will be 50 percent more when I'm on trip on my mobile. It started finding the weather of where I'm going. It starts then started with the deals. Then it started with the hotel accommodations. So when I'm on a trip my searches are much higher. I mean if I'm doing one search on a daily basis I do like eight to nine searches when I'm on a trip.

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**APPENDIX G**  
**ONLINE SURVEY FOR INTERVIEW RESULTS VERIFICATION**

## **Q1 Consent Form The Use of Smartphones by American Travelers**

### **Investigator's Statement:**

The researchers at Temple University in Philadelphia, PA are conducting a study to understand the impact of smartphones on mobility and travel experience. You are invited to complete a 20-30 minute survey. In the survey, you will be asked to describe your use of smartphone (e.g. iPhone, Android-based phone) and/or tablet PC (e.g. iPad) and your travel experience. Your participation in this research is voluntary. You may refuse to participate, discontinue participation, or skip any questions you don't wish to answer at any time without penalty or loss of the benefits to which you are otherwise entitled. When you complete the survey, you will be entered into a drawing to win \$200 gift card and the winner will be notified by email. If you have any questions or concerns, please do not hesitate to contact Dan Wang, Speakman Hall 393, 1810 North 13th street, Philadelphia, PA 19122, (215) 204-5612 or at dan.wang@temple.edu.

### **Participant's Statement:**

My participation in this study is on voluntary basis, and I may refuse to participate at any time without consequence or prejudice. I understand that if I participate in the interview, the interview process will be audio recorded for later research purpose. Although the study team has placed safeguards to maintain the confidentiality of my personal information, there is always a potential risk of an unpermitted disclosure. To that degree, all documents and information pertaining to this research study will be kept confidential, unless required by applicable federal, state, and local laws and regulations to be disclosed. I understand the records and data generated by the study may be reviewed by Temple University and its agents, the study and compliance with regulations. I understand that the results of this study may be published. If any data is published, I will not be identified by name.

If I have any questions my rights as a research subject, I may contact the Institutional Review Board (IRB) Coordinator at (215) 707-3390; irb@temple.edu or via regular mail: Institutional Review Board Coordinator Temple University Research Administration Student Faculty Conference Center 3340 North Broad Street - Suite 304, Philadelphia, PA 19140 USA. I certify that I am 18 years of age or older, have read this form, and volunteer to participate in this research study.

Please  if you agree to participate in the survey, and then click the Next button below. (1)

If Please  if you agree... Is Not Selected, Then Skip To End of Survey

Q2 Thank you in advance for taking a moment to participate in our survey.

To navigate through the survey, please use the "Previous Page" and "Next Page" buttons only. Please do not use the back and forward buttons from your browser.

Q3 First, we would like to know about your use of mobile device(s) including smartphones (e.g. iPhone, Android phones) and tablet computers (e.g. iPad)

Currently, do you own and use any of the following mobile device(s)? (Please select all that apply)

- Smartphone (e.g. iPhone, Droid, Blackberry) (1)
- Tablet computer (e.g. iPad, Galaxy Tab) (2)
- None of the above (3)

*If None of the above Is Selected, Then Skip To End of Survey*

Q4 How long have you owned your mobile device(s)? (Please select a response for each device)

Q5 For your most used mobile device(s), what kind(s) of data plan for Internet access are you using? (Please select one response)

- Limited data plan(s) (1)
- I don't know (2)
- Unlimited data plan(s) (4)

Q6 How many applications (apps) do you currently have installed on your most frequently used smartphones? (Please select a response for each item)

	None (1)	1 to 10 (2)	10 to 20 (3)	20 to 30 (4)	M ore than 30 (5)
Free (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 What kinds of apps do you have on your mobile device(s)? (Please select all that apply)

- News and weather (e.g. NY Times, USA Today) (1)
- Business & Productivity (e.g. Document To Go, CamCard, iSchedule) (2)
- Finance (e.g. Stockquotes, Chase Mobile, Mortgage Calculator) (3)
- Photography (e.g. Instagram, PicSay) (4)
- Education (e.g. Math Bingo, Vocabulary trainer) (5)
- Entertainment (e.g. TV, comics, Talking Tom Cat) (6)
- Social networking (e.g. Facebook, Twitter) (7)
- Games (e.g. Angry Birds, Fruit Ninja) (8)
- Health & Fitness (e.g. My Tracks, Calorie Counter) (9)
- Lifestyle (e.g. Bartender, Receipts Book) (10)
- Medical (e.g. iPharmacy, Medscape) (11)
- Music & Audio (e.g. Pandora) (12)
- Navigation & Transportation (e.g. MapQuest, Subway Schedules) (13)
- Communication (e.g. Gmail, eBuddy Messenger) (14)
- Travel (e.g. Tripadvisor, TripIt, Yelp) (15)
- Books (e.g. iBook, Kindle) (16)
- Shopping (e.g. Coupons, Amazon.com) (17)
- Others (18) \_\_\_\_\_

Q8 Now, we would like to know about your use of mobile device(s) in your daily life.

Please describe a typical day for how you use your smartphones and/or tablets. For example, please describe your use of your mobile device from morning to evening.

Q9 Do you feel any changes (e.g. the changes of old habits, or the development of new habits) in your daily life brought on by your use of smartphone/tablet? If yes, please describe the changes.

Q10 Now, we would like to know about your travel and the use of mobile device(s).

During the past 12 months (June 1, 2011- May 31, 2012), how many pleasure, vacation or personal trips (to places at least 50 miles away from home or included an overnight stay) have you taken? (Please select one response)

- None (1)
- 1-2 (2)
- More than 3 (3)

*If None Is Selected, Then Skip To End of Survey*

Q11 Please indicate the extent to which you agree with the following statements about travel planning for overnight pleasure trips after you started using a smartphone/tablet. (Please select a response for each statement)

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree or Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)
I used my mobile device to assist my travel planning before the trip. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I used my mobile device to assist my travel activities during the trip. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 For overnight pleasure trips after you started using a smartphone/tablet, what kinds of apps did you use? (Please select all that apply).

- Flight info. manager (1)
- Destination guides (2)
- Online travel agency (3)
- Attractions guides (4)
- Restaurants finder (5)
- Language assistant (6)
- Local transportation (7)
- Navigation (8)
- Currency converter (9)
- Location-aware social apps (e.g. Four square) (10)
- Distance live video (e.g. WorldView, Time Square Live) (11)
- Widgets (e.g. Cheap Gas, Wi-Fi Finder, Tips calculator) (12)
- Others (13) \_\_\_\_\_

None of the above (14)

Q13 Now, we would like to know more details about your experiences in using your mobile devices in travel. Please tell us some stories regarding your use of mobile device for travel and the impact of such use on your travel experience.

Please describe your most recent overnight pleasure trip. (Places you went to, how long you stayed, whom you traveled with, and what you did/saw, etc.).

Q14 Have you used your smartphones/tablets to plan your trip before departure?

Yes (1)

No (2)

*If No Is Selected, Then Skip To Have you used your smartphone/tablet ...*

Q15 Please describe which aspects of a trip you typically plan for using a smartphone/tablet before departure and explain the reasons why you use a smartphone/tablet instead of other alternative devices, such as desktop computer. Please be specific as to situations, patterns, or preference that you observed from your typical pre-departure use of a smartphone.

Q16 When you use a smartphone/tablet to plan your trips before departure, please tell us how you decide which features/apps to use and how you learned to use them.

Q17 Have you used your smartphone/tablet to help you during your trip?

Yes (1)

No (2)

*If No Is Selected, Then Skip To Have you used your smartphone/tablet ...*

Q18 Please describe how you use a smartphone/tablet to help you during your trip and how such use influences your travel experience. Please be specific as to situations, patterns, or preference that you observed from your typical use of a smartphone during your trip.

Q19 When you use a smartphone/tablet to help you during a trip, please tell us how you decide which features/apps to use and how you learned to use them.

Q20 Have you used your smartphone/tablet after returning from a trip to do anything related with the trip?

- Yes (1)
- No (2)

*If No Is Selected, Then Skip To In general, thinking about your travel...*

Q21 Please describe any trip-related follow up activities that you typically do using a smartphone/tablet after returning from a trip and explain why you do not use other alternative devices such as a desktop computer to do such activities. Please be specific as to situations, patterns, or preference that you observed from your typical use of a smartphone after your trip.

Q22 When you use a smartphone/tablet for trip-related follow up activities after returning from a trip, please tell us how you decide which features/apps to use and how you learned to use them.

Q23 Please think about your travel planning and experiences before you started using a smartphone/tablet. Please explain how much difference the use of a smartphone/tablet brings to your travel experience.

Q24 Do you feel any differences in terms of functions, apps, and services when you use a smartphone/tablet for general everyday activities and when you use it for travel purposes? Explain why.

Q25 Demographics      Gender:

- Male (1)
- Female (2)

Q26 Which age group are you belong to?

- 18 - 30 (1)
- 31 - 40 (2)
- 41 - 50 (3)
- 51 - 60 (4)
- 61 - 70 (5)
- above 71 (6)

**APPENDIX H**  
**FINDINGS OF ONLINE SURVEY**

Table H1. The Use of Smartphones for Travel

Category	Use Activities	No. of Informants
Communication (4 items)	Phone calls ( <i>T_Calls</i> )	4
	Send/Receive emails ( <i>T_Email</i> )	5
	Send/Receive text msg ( <i>T_TextMsg</i> )	2
	Login to facebook ( <i>T_Facebook</i> )	1
Entertainment (7 items)	Take photos ( <i>T_Photo</i> )	1
	Listen to music ( <i>T_Music</i> )	1
	Play game ( <i>T_Game</i> )	0
	Read book ( <i>T_Book</i> )	1
	Surf on Internet ( <i>T_InternetSurf</i> )	0
	Read news ( <i>T_News</i> )	1
	Watch movie ( <i>T_Movie</i> )	1
Facilitation (6 items)	Navigation during trip ( <i>T_Navigation_d</i> )	22
	Check weather info ( <i>T_Weather</i> )	0
	Manage itinerary ( <i>T_ItineraryMgt</i> )	3
	Track or check in flight ( <i>T_Flightrack/Checkin</i> )	2
	Purchase ticket prior trip ( <i>T_TktPurchase_p</i> )	2
	Purchase ticket during trip ( <i>T_TktPurchase_d</i> )	0
InfoSearch (8 items)	Search restaurant ( <i>T_Restaurant</i> )	1
	Search activities ( <i>T_Thingstodo</i> )	1
	Search Flight ( <i>T_Flight</i> )	1
	Search hotel prior trip ( <i>T_Hotel_d</i> )	1
	Search info. from twitter ( <i>T_Twitter</i> )	0
	Search deals during trip ( <i>T_Deal_d</i> )	1
	Search hotels prior trip ( <i>T_Hotel_p</i> )	1
	Search deals prior trip ( <i>T_Deal_p</i> )	0

Note: N=43

*The findings in the online survey verified the findings from the interviews, because the respondents in the online survey reported similar use activities of smartphones for travel.*

Table H2. Motivations Driving the Use Activities of Smartphones for travel

Category	Motivations	No. of Informants
Extrinsic Motivation (12 items)	Social Fun	0
	KeepConnected/Informed	1
	Food	1
	KeepSafe	0
	PlanTrip	0
	Directions	0
	Transportation	0
	Accommodation	0
	Thingstodo	0
	BetterValue	0
	BeIsolated	0
	Shows	0
Intrinsic Motivation (2 items)	Habit	0
	KillTime	0

Note: N=43

*The findings of the online survey did not provide verification for the findings from the interviews regarding the motivations driving the use of smartphones for travel, because the respondents in the online survey did not describe the context and conditions of the use of smartphones for travel.*

Table H3. Cognitive Beliefs towards the Use of Smartphones for travel

Category	Cognitive Beliefs	No. of Informants
Cognitive Beliefs (4 items)	Convenience/Ease of use	19
	Usefulness	5
	Trust	0
	Social norm	1

Note: N=43

*The findings in the online survey partially verified the findings from the interviews, because the respondents in the online survey reported similar cognitive beliefs driving the use activities of smartphones for travel.*

Table H4. Facilitators of the Use of Smartphones for travel

Category	Faciliators	No. of Informants
Situational and personal facilitators (3 items)	No computer access ( <i>NoPC</i> )	0
	Use experience on websites ( <i>PCExperience</i> )	4
	Prior use experience ( <i>PriorUse</i> )	0

Note: N=43

*The findings in the online survey provided limited verification for the findings from the interviews, because the respondents in the online survey reported only one facilitator which is exactly same as the findings in the interviews.*

Table H5. Changes of Travel Experience

Category	Changes	No. of Informants
Changes of travel activities (5 items)	Easy planning ( <i>EasyPlan</i> )	12
	More flexibility during trips ( <i>MoreFlexible</i> )	3
	More planning before trips ( <i>MoreInfoPlan</i> )	0
	Less after trip follow up ( <i>LessFollowup</i> )	0
	Increase trips ( <i>MoreTravel</i> )	0
Changes of interpretations and sensations (7 items)	More connected with others ( <i>MoreConnected</i> )	2
	More informative ( <i>MoreInformative</i> )	7
	Gaining better value of trips ( <i>BetterValue</i> )	2
	More fun during trips ( <i>MoreEntertain</i> )	2
	Travel is less stressful ( <i>LessStressful</i> )	0
	Travel is more secure ( <i>MoreSecure</i> )	0
	More confident about travel ( <i>MoreConfident</i> )	0

Note: N=43

*The findings in the online survey partially verified the findings from the interviews, because the respondents in the online survey reported some similar changes of travel experience as the findings in the interviews.*

Table H6. The Use of Smartphones in Everyday Context

Category	Daily use activities	No. of Informants
Communication (4 items)	Send/Receive emails ( <i>D_Email</i> )	22
	Send/Receive text msg ( <i>D_TextMsg</i> )	15
	Login Facebook ( <i>D_facebook</i> )	10
	Phone calls ( <i>D_Calls</i> )	12
Entertainment (7 items)	Read news ( <i>D_News</i> )	14
	Play games ( <i>D_PlayGame</i> )	13
	Listen to music ( <i>D_Music</i> )	3
	Read news on twitter ( <i>D_Twitter</i> )	2
	Take and share photos ( <i>D_Photo</i> )	0
	Watch movie ( <i>D_Movie</i> )	1
	Read book ( <i>D_Book</i> )	5
Facilitation (6 items)	Navigation ( <i>D_Navigation</i> )	7
	Check weather info ( <i>D_Weather</i> )	3
	Use as alarm ( <i>D_Alarm</i> )	5
	Daily schedule ( <i>D_CalendarPlanner</i> )	7
	Manage bank accounts ( <i>D_Bank</i> )	3
	Manage stock ( <i>D_Stock</i> )	0
InfoSearch (4 items)	Record & Price comparison ( <i>D_Shopping</i> )	1
	Search for restaurants ( <i>D_Rest.</i> )	1
	General info. search ( <i>D_GenInfosearch</i> )	6
	Search for travel deals/ideas ( <i>D_TravelIdeas</i> )	0

Note: N=43

*The findings in the online survey verified the findings from the interviews, because the respondents in the online survey reported similar use activities of smartphones in everyday context.*

Table H7. Changes in everyday experience after the adoption of smartphones

<b>Category</b>	<b>Changes in life</b>	<b>No. of Informants</b>
EverydayChanges (7 items)	Extension/ReplaceICTTools	15
	NewBehavior	3
	MoreConnected_Life	8
	InfoAccessTool	10
	Routines/Habits	0
	UseOfDownTime	3
	TechSavvy	1

*Note: N=43*

*The findings in the online survey partially verified the findings from the interviews, because the respondents in the online survey reported some similar changes in daily lives after the adoption of smartphones as the findings in the interviews.*

**APPENDIX I**  
**MEMBER CHECK INVITATION & OUTCOMES**

**Dear XXX,**

**As we talked over the interview, you are one of the important contributors for our project. Your opinions and feedbacks are highly respected.**

**We appreciated that if you can go through the attached documents. Please rate your degree of agreement with the each paragraph of our conclusion in the table at the end of the document. Also, you are welcome to provide more specific comments and feedback.**

**Thank you very much for your great support!**

**Looking forward your reply.**

**Best ,  
Dan**

# **THE MECHANISMS SHAPING THE USE OF MOBILE DEVICES FOR TRAVEL**

**(For Informant's review)**

## **Overview**

The purpose of this project is to identify the mechanisms shaping the use of smartphones for travel. The mechanism refers to the factors influencing the use activities of smartphones for travel and the interactive relationships of these factors. The findings indicate that the use of smartphone for travel are shaped by people's use of smartphones in daily and the specific contextual factors in trips.

This study identified in total six elements that affect the use activities of smartphones for travel, including i) daily use of smartphones, ii) perceived changes of smartphone use pattern in daily life, iii) extrinsic and intrinsic motivations to use smartphones for travel, iv) cognitive beliefs towards the use of smartphones, v) contextual facilitators (e.g. no computer access), and vi) perceived changes of travel planning activities, travel features, and sense of comfort. In general, smartphones are first adopted as a telecommunication and information communication tool to support the communication and information needs in peoples' daily lives. Due to their strong capabilities in providing information services and entertainment, smartphones are progressively penetrated into peoples' daily lives to facilitate people in a wide range of daily activities. As a result, the use of smartphones is changing people's lifestyle, communication style, and attitudes towards mobile technology. These changes are found to influence travelers' use of smartphones for travel. Also, the use activities of

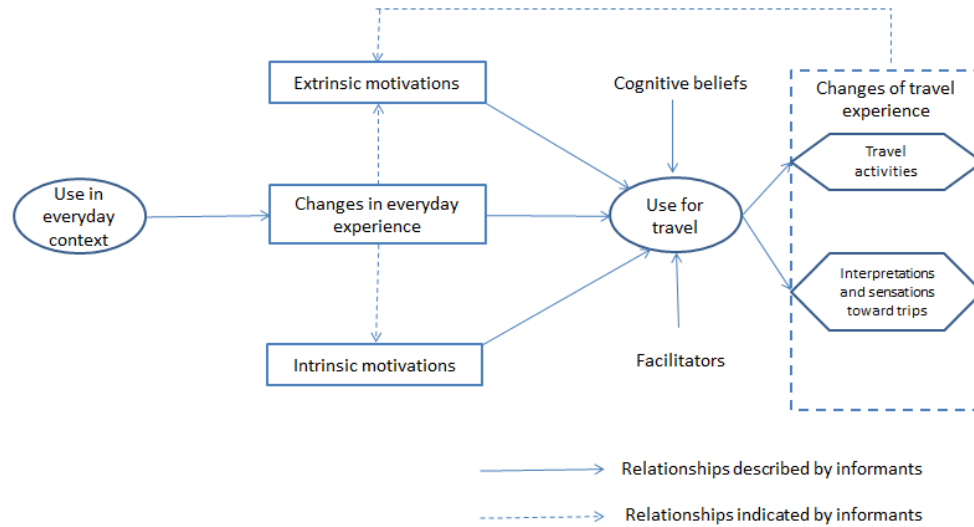
smartphones are influenced by the extrinsic (e.g. hungry, needs food) and intrinsic (e.g. habit) motivations raised from the specific circumstances in travel, travelers' cognitive beliefs towards smartphones (e.g. thinking that the smartphone is useful and convenient), and some other facilitating conditions (e.g. no computer access). Finally, the use activities of smartphones for travel lead to a series changes of travel planning behaviors (e.g. planning less before a trip) and travelers' emotions (e.g. feeling more secure and connected). All these changes, in turn, set up conditions for the increasing use of smartphones for travel.

### **Main Findings: Mechanisms shaping the use of smartphone for travel**

The analysis of interviewees' transcripts on the relationships among the six elements indicates that the use activities of smartphones for travel are shaped by not only the factors raising for travel context but also the daily use activities of smartphones. The relationships of the use activities of smartphone in daily and travel contexts are demonstrated in Figure 1.

#### **Daily Use Activities:**

With the advantages of ubiquitous Internet access, agglomeration of multiple digital devices, and portability, everyday people use their smartphones, from the time after they wake-up to the time before they close their eyes, for communications, entertainments, facilitations, and information searches. As such, the use of smartphones has progressively changed peoples' lives by changing old routines and developing new ones.



**Figure 1. Mechanisms shaping the use of smartphones for travel**

**Daily Changes Enabled by Smartphone:**

Smartphones have encouraged people to use mobile devices in a different way and to adopt a new pattern of mobile device use in their daily lives. With such new behavioral pattern, the people’s daily lives are influenced from three dimensions: communication, the use of “downtime”, and the satisfaction of information needs. First, the people become more connected with others through a variety ways (e.g. text message, facebook, or messengers) and more connected with the “external world” through the ubiquitous access to the Internet. Second, smartphones changed the ways to use the “downtime”. With smartphones, the people have the capability to do more entertainments (e.g. music, movie, take photo etc.) and have the access to Internet anytime and anywhere. As such, the previous “downtime” can be taken good use for self-entertainments (e.g. games) or searching for deals or planning trips. Third, smartphones enable the fulfillment of information needs easier anytime and anywhere?. As such, the people revealed the

increased reliance on the smartphone to support their information search as well as fulfill spontaneous information needs.

**Daily Changes and Use of Smartphone for travel:**

People are changed by the use of smartphone in their daily lives. They may increase their frequencies to contact with others through text message or Facebook messages or emails. They may use their smartphones to replace many other tools such mp3 player, camera. Also, the convenience of smartphone for information search encourages people to use the smartphones to search for information more often. The analysis reveals that these changes in daily life indeed influence how people use smartphone for travel. For example, people reported that they are now more approachable or more connected with others because of smartphone, so when they travel, they keep checking email, text message, and social networks to stay connected. Also, people reported that they replaced many other tools (e.g. GPS, mp3 player, and camera) with smartphone, so they tend to do more things by using the smartphone than before. For example, people learned to use smartphones as a GPS, a camera, and an information search tool. In their travel, they used the smarphone as a GPS, a camera, and a information search tool because they get used to use smartphone for these tasks in their daily lives.

**Contextual Factors Influencing the use of Smartphone for travel:**

Three sets of factors are identified as the drivers of the use activities of smartphone for travel. The first set of factors includes travelers' extrinsic and intrinsic motivations to achieve some purposes, such as to obtain foods, to find a direction, to share photos with friends, or to kill time. The second set of factors includes travelers'

cognitive beliefs toward the use of smartphones, such as perceived usefulness, perceived ease of use, trust, and social norms. These cognitive beliefs lead travelers to choose smartphones other than any alternative devices to fulfill their needs generated from the extrinsic and intrinsic motivations. The third set of factors refers to the facilitators, including no computer (desktop/laptop) access, websites use experience on computer, and prior use experience on the smartphone platform. This section will describe these three sets of factors.

**Travel Changes Enabled by the Use of Smartphone in Travel:**

The use of smartphones has changed travelers in terms of their travel planning activities and travel experiences. On the one hand, the use of smartphones has changed the timing of travel planning. With smartphones, travelers can postpone the timing of decision-making on restaurants, local transportation, things to do from the pre-consumption stage (i.e., before a trip) to the consumption stage (i.e., during a trip). Smartphones also enable travelers to share their experiences en-route through posting pictures on the social network websites or texting with family and friends to update travel status, which is in contrast with the practice of sharing experiences after trips without the adoption of smartphones. On the other hand, the use of smartphones glues travelers' daily lives and their travel experience. During travel, travelers' are kept connected with the contacts in their daily lives through the ways of communication that they prefer as usual. Thus, travelers feel more connected, less stressful, and more secure because they always can get support from family and friends and never feel being isolated. In addition, the constant connection with the information sources that travelers used in their daily lives enables travelers to be flexible by taking advantage of online planning even when they

are en-route. Thus, travelers become more confident on their trips and believe that they can get better monetary value from trips.

**Feedback from informants:**

***Informant #15:***

Please type “X” in the cell to indicate the degree of your agreement with the descriptions in the above each paragraph:

	<b>Strongly disagree</b>				<b>Strongly agree</b>
	1	2	3	4	5
<i>Overview</i>					X
<i>Figure 1</i>				X	
<i>Daily Use Activities</i>					X
<i>Daily Changes Enabled by Smartphone</i>					X
<i>Daily Changes and Use of Smartphone in Travel</i>				X	
<i>Contextual Factors Influencing the Use of Smartphone in Travel</i>					X
<i>Travel Changes Enabled by the Use of Smartphone in Travel</i>					X

**Please let us know your specific comments:**

“Also, people reported that they replaced many other tools (e.g. GPS, mp3 player, camera) with smartphone, so they tend to do more things by using the smartphone than before.”

Sudheer : I always wonder this could have been done much more but I don't think the pace of the new gen devices is moving enough faster due to the economic slowdown. Yes its true I m able to do more with my smartphone but I wish I could do much more. For example my camera on blackberry really sucks but that s the only way I can quickly take a picture and upload to FB. And if there is a smartphone which has the high end features like a good camera phone, it ends up being extremely expensive and out of my budget. All we need is a smartphone which brings in the basics in life together and still be affordable. I'm still waiting for such product. I also think lack of enough travel onsite applications is one reason I m not able to make use of my smartphone for doing more while travelling. In the last few years, the way travel booking sites like expedia and hotwire have integrated air travel with hotel accommodation and rental cars, these travel sites should integrate local travel deals and build a downloadable application on to smartphones with which I feel empowered to always find value with my money when travelling.

Thank You.

**Informant #18:**

	<b>Strongly disagree</b>				<b>Strongly agree</b>
	1	2	3	4	5
<i>Overview</i>					X
<i>Figure 1</i>					X
<i>Daily Use Activities</i>					X
<i>Daily Changes Enabled by Smartphone</i>					X
<i>Daily Changes and Use of Smartphone in Travel</i>					X
<i>Contextual Factors Influencing the Use of Smartphone in Travel</i>					X
<i>Travel Changes Enabled by the Use of Smartphone in Travel</i>					X

**Please let us know your specific comments:**

I strongly agree with each of the paragraphs in this research. I feel that You have captured the mechanisms shaping the use of smartphoness in travel.

I would like to compliment Dan Wang, for the superb job in conducting this interview with me. I feel she expertly asked the interview questions...with lucidity & comprehension. She was articulate and had excellent clarity.

**Informant #9:**

	<b>Strongly disagree</b>				<b>Strongly agree</b>
	1	2	3	4	5
<i>Overview</i>				X	
<i>Figure 1</i>				X	
<i>Daily Use Activities</i>					X
<i>Daily Changes Enabled by Smartphone</i>				X	
<i>Daily Changes and Use of Smartphone in Travel</i>				X	
<i>Contextual Factors Influencing the Use of Smartphone in Travel</i>				X	
<i>Travel Changes Enabled by the Use of Smartphone in Travel</i>				X	

**Please let us know your specific comments:**

The findings of this study give a great example how technology has changed every aspect of our lives, including how we spend our vacation and travel time. I would be interested in seeing a few key statistics in this report (percentages, e.g.) to see how much of any effect smartphones have had, according to the study. Overall, this is a very interesting study, and it appears to be carefully planned and executed. I would like to see it expanded upon in the future, possibly including how much smartphones effect travel plans for different age brackets, genders, different types of trips, etc. Thank you for making me a part of this research!

**Informant #22:**

**Please type "X" in the cell to indicate the degree of your agreement with the descriptions in the above each paragraph:**

	Strongly disagree				Strongly agree
	1	2	3	4	5
<i>Overview</i>				X	
<i>Figure 1</i>				X	
<i>Daily Use Activities</i>					X
<i>Daily Changes Enabled by Smartphone</i>					X
<i>Daily Changes and Use of Smartphone in Travel</i>					X
<i>Contextual Factors Influencing the Use of Smartphone in Travel</i>					X
<i>Travel Changes Enabled by the Use of Smartphone in Travel</i>					X

**Please let us know your specific comments:**

I realized that upon my travels since Jan 2011, I had a few conversations with new acquaintances about my travels while I was unemployed. I recall seeing these people with smart phones and telling them how I was able to achieve worldly travels without a job. I explained to them that sites like travelzoo was a big factor in finding affordable airfare and that I'd buy the ticket and figure out the rest of the details when I got to my destination.

Overall, I feel smart phone carriers are in it more for the social standing than the actual use that it can be, i.e. alternative to a laptop. I find older generations with a smart phone and only use it to call or text someone, if they found the love of texting, which many have not. There are even younger generations, people born before 1989 who do the exact same thing. And when they travel, especially overseas, they leave their mobile at home. Which makes me think that they aren't smart phone savvy and their use has not affected their way of traveling at all.

***Informant #14:***

Hello Dan I finally got a chance to comment on your project and first I want to say congrats because its very good. You captured all the aspects of the way that our smartphones have enriched our lives. It was complete and I feel honored to have been a part of the project. Its perfect and im sure youre going to get an A. My feedback is that if was your professor id give you an A becuse for one its well written and for two even though on the surface this whole study seems like common sense to my generation who was in around before the internet and lived through its introduction and now participating in its perfection and evolution it makes me cognative of now how depended I am on my phone as a means to stay connected to the world and thinking back to a time when I didnt have a smart phone all the things I now use it for. I dont need a map, i wont get lost, ill find places to eat, Ill communicate with friends, Ill take pictures, ill use it to experince the world. It made me aware of how much I use it and the different ways and thankful now that its so much easier to plan and communicate and travel. Thank you for letting me be a part of this.

[Quoted text hidden]

**APPENDIX J**  
**INTER-CODER RELIABILITY**

This appendix presents the construct of inter-coder reliability in three sections: procedures, the sample of data, and results.

### ***I. Inter-coder Reliability Procedures***

The procedures suggested by Lombard, Snyder-Duch, and Bracken (2002) were followed to construct the inter-coder reliability in this study:

- The reliability sample is the 15 transcripts of the first 15 informants. The selection of the reliability sample is based on the consideration of including every code in the sample. As such, the inter-coder reliability for each code can be checked. In this study, the analysis of the transcripts of the first 15 informants generated 86 codes which were organized into seven categories, and the codebook did not change after the analysis of the 14<sup>th</sup> informants. Therefore, the transcripts of these 14 interviews can provide a complete sample to ensure the check of inter-coder reliability for each code.
- Due to the large number of codes of this study, the codes were organized into four sets: 1) Daily and travel uses of smartphones; 2) the changes in daily lives; 3) the direct factors influencing the uses of smartphones including motivations, cognitive beliefs, and facilitators; and 4) the changes of travel experience. Two coders (exclude researcher) from other fields were invited to code two sets of the codes.
- The coders were asked to assign the codes to each unit of analysis (i.e. sentence or paragraphs). Multiple codes can be assigned to one unit of analysis. In the calculation process, each code was regarded as one variable. For example, if one sentence was assigned for three codes, the three codes were input to data table separately.
- The online software ReCal was used to calculate the Krippendorff's Alpha (<http://dfreelon.org/recal>). If the Krippendorff's Alpha is above 0.7, the inter-coder reliability was acceptable at a minimum level of acceptance (Krippendorff, 1987).
- The disagreements in the reliability coding were checked for clarification. The investigation identified that the disagreements mainly existed for the sentences which can be assigned for several codes. The coders discussed the disagreements and refined the definitions of the codes.

### ***II. Sample of Data***

A sample of data input in ReCal is presented. Figure J1 shows a file containing three variables, each with a corresponding pair of code data—A-B, C-D, and E-F. Each row represents one unit of analysis.

Table J1 Example of data input in ReCal 2.0

	A	B	C	D	E	F
1	V1C5	V1C1	V2C5	V2C1	V3C5	V3C1
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	1	1	0	0
5	0	0	0	0	1	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	1	0	0	0	0	0
12	0	0	1	1	0	0
13	0	0	0	0	0	0
14	1	1	0	0	0	0
15	0	0	1	0	0	0
16	0	0	1	0	0	0
17	0	0	0	0	0	0
18	0	0	1	1	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	1	1
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	1	1	0	0
32	1	1	0	0	0	0
33	0	0	1	0	0	0

### III. Inter-coder Reliability Results

**Table J2 Inter-coder Reliability\_The Use of Smartphones in Everyday Context**

	<b>Percent Agreement</b>	<b>Krippendorff's Alpha</b>	<b>N Cases</b>	<b>N Decisions</b>
Variable 1 (cols 1 & 2)	100	1	64	128
Variable 2 (cols 3 & 4)	100	1	64	128
Variable 3 (cols 5 & 6)	100	1	64	128
Variable 4 (cols 7 & 8)	100	1	64	128
Variable 5 (cols 9 & 10)	100	1	64	128
Variable 6 (cols 11 & 12)	100	1	64	128
Variable 7 (cols 13 & 14)	100	1	64	128
Variable 8 (cols 15 & 16)	100	1	64	128
Variable 9 (cols 17 & 18)	98.44	0.66	64	128
Variable 10 (cols 19 & 20)	100	1	64	128
Variable 11 (cols 21 & 22)	100	1	64	128
Variable 12 (cols 23 & 24)	100	1	64	128
Variable 13 (cols 25 & 26)	100	1	64	128
Variable 14 (cols 27 & 28)	100	1	64	128
Variable 15 (cols 29 & 30)	100	1	64	128
Variable 16 (cols 31 & 32)	100	1	64	128
Variable 17 (cols 33 & 34)	100	1	64	128
Variable 18 (cols 35 & 36)	98.44	0.79	64	128
Variable 19 (cols 37 & 38)	100	1	64	128
Variable 20 (cols 39 & 40)	100	1	64	128
Variable 21 (cols 41 & 42)	100	1	64	128

**Table J3 Inter-coder Reliability\_Changes in Everyday Experience**

	<b>Percent Agreement</b>	<b>Krippendorff's Alpha</b>	<b>N Cases</b>	<b>N Decisions</b>
Variable 1 (cols 1 & 2)	98.31	0.95	59	118
Variable 2 (cols 3 & 4)	96.61	0.73	59	118
Variable 3 (cols 5 & 6)	98.31	0.85	59	118
Variable 4 (cols 7 & 8)	96.61	0.91	59	118
Variable 5 (cols 9 & 10)	94.92	0.77	59	118
Variable 6 (cols 11 & 12)	100	1	59	118
Variable 7 (cols 13 & 14)	100	1	59	118

**Table J4 Inter-coder Reliability\_The Use of Smartphones in Travel**

	<b>Percent Agreement</b>	<b>Krippendorff's Alpha</b>	<b>N Cases</b>	<b>N Decisions</b>
Variable 1 (cols 1 & 2)	100	1	60	120
Variable 2 (cols 3 & 4)	100	1	60	120
Variable 3 (cols 5 & 6)	100	1	60	120
Variable 4 (cols 7 & 8)	100	1	60	120
Variable 5 (cols 9 & 10)	100	1	60	120
Variable 6 (cols 11 & 12)	100	1	60	120
Variable 7 (cols 13 & 14)	100	1	60	120
Variable 8 (cols 15 & 16)	100	1	60	120
Variable 9 (cols 17 & 18)	100	1	60	120
Variable 10 (cols 19 & 20)	100	1	60	120
Variable 11 (cols 21 & 22)	100	1	60	120
Variable 12 (cols 23 & 24)	95	0.84	60	120
Variable 13 (cols 25 & 26)	100	1	60	120
Variable 14 (cols 27 & 28)	98.33	0.79	60	120
Variable 15 (cols 29 & 30)	100	1	60	120
Variable 16 (cols 31 & 32)	100	1	60	120
Variable 17 (cols 33 & 34)	100	1	60	120
Variable 18 (cols 35 & 36)	96.67	0.84	60	120
Variable 19 (cols 37 & 38)	100	1	60	120
Variable 20 (cols 39 & 40)	100	1	60	120
Variable 21 (cols 41 & 42)	100	1	60	120
Variable 22 (cols 43 & 44)	100	1	60	120
Variable 23 (cols 45 & 46)	100	1	60	120
Variable 24 (cols 47 & 48)	100	1	60	120
Variable 25 (cols 49 & 50)	100	1	60	120

**Table J5 Inter-coder Reliability\_Director Factors (Motivations, Cognitive Beliefs, and Facilitators)**

	<b>Percent Agreement</b>	<b>Krippendorff's Alpha</b>	<b>N Cases</b>	<b>N Decisions</b>
Variable 1 (cols 1 & 2)	98.17	0.88	109	218
Variable 2 (cols 3 & 4)	96.33	0.76	109	218
Variable 3 (cols 5 & 6)	98.17	0.88	109	218
Variable 4 (cols 7 & 8)	98.17	0.66	109	218
Variable 5 (cols 9 & 10)	99.08	0.85	109	218
Variable 6 (cols 11 & 12)	98.17	0.85	109	218
Variable 7 (cols 13 & 14)	100	1	109	218

Variable 8 (cols 15 & 16)	100	1	109	218
Variable 9 (cols 17 & 18)	99.08	0.85	109	218
Variable 10 (cols 19 & 20)	100	1	109	218
Variable 11 (cols 21 & 22)	100	1	109	218
Variable 12 (cols 23 & 24)	100	1	109	218
Variable 13 (cols 25 & 26)	98.17	0.79	109	218
Variable 14 (cols 27 & 28)	99.08	0.90	109	218
Variable 15 (cols 29 & 30)	96.33	0.84	109	218
Variable 16 (cols 31 & 32)	97.25	0.83	109	218
Variable 17 (cols 33 & 34)	100	1	109	218
Variable 18 (cols 35 & 36)	100	1	109	218
Variable 19 (cols 37 & 38)	99.08	0.88	109	218
Variable 20 (cols 39 & 40)	100	1	109	218
Variable 21 (cols 41 & 42)	100	1	109	218

**Table J6 Inter-coder Reliability\_The Changes of Travel Experience**

	<b>Percent Agreement</b>	<b>Krippendorff's Alpha</b>	<b>N Cases</b>	<b>N Decisions</b>
Variable 1 (cols 1 & 2)	98.67	0.94	75	150
Variable 2 (cols 3 & 4)	97.33	0.89	75	150
Variable 3 (cols 5 & 6)	100	1	75	150
Variable 4 (cols 7 & 8)	100	1	75	150
Variable 5 (cols 9 & 10)	100	1	75	150
Variable 6 (cols 11 & 12)	97.33	0.84	75	150
Variable 7 (cols 13 & 14)	94.67	0.80	75	150
Variable 8 (cols 15 & 16)	100	1	75	150
Variable 9 (cols 17 & 18)	100	1	75	150
Variable 10 (cols 19 & 20)	97.33	0.82	75	150
Variable 11 (cols 21 & 22)	97.33	0.82	75	150
Variable 12 (cols 23 & 24)	98.67	0.85	75	150