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What is mission critical in the hotel guest room: Examining in-room guest empowerment technologies

Pelin Nasoz

University of Nevada, Las Vegas

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WHAT IS MISSION CRITICAL IN THE HOTEL GUEST ROOM: EXAMINING
IN-ROOM GUEST EMPOWERMENT TECHNOLOGIES

by

Pelin Nasoz

Bachelor of Arts
Bogazici University, Istanbul
2007

A thesis submitted in particular fulfillment
of the requirement for the

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The Graduate College**

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William F. Harrah College of Hotel Administration

Mehmet Erdem, Committee Chair

Ashok Singh, Committee Member

Pearl Brewer, Committee Member

Keong Leong, Graduate College Representative

Ronald Smith, Ph. D., Vice President for Research and Graduate Studies
and Dean of the Graduate College

December 2011

ABSTRACT

What is Mission Critical in the Hotel Guest Room: Examining In-Room Guest Empowerment Technologies

by

Pelin Nasoz

Dr. Mehmet Erdem, Examination Committee Chair
Associate Professor of Hotel Administration
University of Nevada, Las Vegas

This study examined 18 in-room technologies and identified the ones perceived to be mission critical for the hotel guests. It also determined the differences in guest empowerment technology preferences and expectations across generations, purpose of travel, and travel frequency. Moreover, it investigated whether the quality of in-room technologies impacts guests' decision in choosing a hotel.

The data were collected through an online survey. A total of 508 people responded to the survey. An importance and performance analysis was utilized to identify the mission critical in-room technologies for the hotels. The analysis indicated that in-room movie on demand services, in-room wireless high speed internet service, high definition television content, in-room electronic temperature control, in-room electronic safe, connectivity panels, and all in one guest room control unit were perceived as being mission critical in-room technologies for hotel guests. The utilization of ANOVA and subsequent post-hoc tests showed that there were significant technology preference differences across the generations and travel frequency. Another important finding of this study was that a majority of respondents reported that the availability of new guest-room technologies would favorably impact their decision to select a hotel. The overall findings

of this study provide information that would help hotel managers and owners to understand guests' perceptions of and expectations for in-room technologies. These findings may possibly provide guidance for strategic purchasing, upgrading or implementing in-room technologies.

Key Words: mission critical technologies, guest empowerment technology, in-room technology, importance- performance analysis, hotel operation

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Chapter 1

Introduction

In the current information age, an organization's success depends on how much it knows about its customers and their needs (Olsen & Connolly, 2000). Only by understanding its customers' needs can an organization create effective policies to survive in this rapidly changing and aggressive universal market. Like other organizations, today's hotels are faced with a number of problems, from a weak economy to rigorous competition (Kandampully, 2006). For example, while in 2008 the average room rate was \$106.84, this rate dropped to \$97.85 in 2009 (AH&LA, 2010). In this environment, customers are more demanding than before (Center for Marketing Effectiveness, 2005) and their needs and demands are primarily service oriented rather than product oriented (Kandampully, 2006). Guests look for more than a comfortable bed in a hotel (Center for Marketing Effectiveness, 2005). Therefore, hotels must give priority to their services (Kandampully, 2006).

Technology helps hotels to offer better service to their customers and thereby increase the customer loyalty (Lee, Barker, & Kandampully, 2003). Customers demand the improved service which technology can enable, such as informative websites and reservation and business centers in the public areas. However, these are not enough for many guests, who demand more technology in the guest rooms, including wireless internet, technologically advanced televisions, gaming consoles and online checkout (Dipietro & Wang, 2010). These features are a few examples of guest empowerment technologies (GET). With these GETs, hotels give "more personal control to the guests over their stay" and enhance their service (Schrier, Erdem, & Brewer, 2010).

Purpose of the Study

The purpose of this study is to examine which in-room guest empowerment technologies (GET) are important to hotel guests; how guests are satisfied with the performance of the GET; and how frequently they use these technologies during their stay in a hotel. This study aims to identify those in-room GET that are perceived as mission critical by the guests. It will also investigate whether the quality of guest room technologies impacts the guests' decision to choose a hotel and if they are willing to pay extra for a guest room which includes current in-room technologies. Moreover, it aims to determine whether there are differences in guests' GET needs and expectations across generations and purpose of travel. Finally, this study will investigate how guests prefer to pay for wireless internet service.

The findings of this study can help hotel managers and owners when they are purchasing, upgrading and implementing in-room GETs. Therefore, this study proposes to assist hotel managers and owners make more efficient and effective guest room technology investment decisions that will enhance the guest experience in their hotels.

Hypothesis

H1: There are differences in guests' GET needs and expectations across generations and purpose of travel.

Research Questions

This study attempts to find the answers to the following research questions:

1. Which in-room GET are mission critical for hotel guests?
2. Which guest room entertainment technologies are important for guests
3. Of the identified GET, which ones do guests use most frequently?

4. Are there differences in guests' GET preferences and expectations across generations?
5. Are there differences in guests' GET preferences and expectations across purpose of travel?
6. Are there differences in guests' GET preferences and expectations in terms of travel frequency?
7. How would guests prefer to pay for the wireless internet service in a hotel (included in room rate or priced separately)?
8. Does the quality of in- room GET impact guests' decisions when choosing a hotel?
9. Are guests willing to pay extra for a guest room which has state of the art in-room technologies?
10. Does an interactive TV in the hotel room enhance the guest experience?

Importance of the Study

It is fair to say that today technology is a part of everyday life. Many people follow technological trends and purchase such technologically advanced devices as TiVos, portable media devices, scanners and digital cameras. In 2002, 20 % of Americans spent more money on home entertainment than they had spent in previous years. This percentage increases to 25 among families with young children (Center for Marketing Effectiveness, 2005).

A study of 1000 travelers conducted by Samsung found that guests who used technology in their home and office expected to find at least the same technologies in the hotel rooms. Seventy-five percent of participants expected hotel entertainment systems to

have at least the same standards as their home entertainment systems, and 60 % said that they expected better technology (Frery, 2008). In this survey, thirty percent of travelers stated that when they were traveling, they missed their home entertainment TV system most. Moreover, more than sixty percent of the participants expressed the opinion that the presence of the some technologies was the main factor in selecting a hotel (Hotelmarketing.com, 2008).

While guests' demand for technology in hotels is on the rise, hotels' information technology budgets continue to increase. Guest room technologies take one of the biggest portions from these increased IT budgets (Erdem, Nusair, & Schrier, 2010). Therefore, it is important for hotel managers and owners to understand which in-room technologies guests appreciate and which they consider dispensable. The findings of this study will show which guest room technologies are perceived as mission critical by the guests and the differences in guests' GET needs and expectations across age groups and purpose of travel. In this study, the term, mission critical indicates which guest room technologies are perceived to be essential by the hotel guests for a hotel guest room.

This study will also investigate which GET guests use most frequently in a guest room and which GET guests are willing to pay more in order to have in the room. These findings will help hotel managers and owners in purchasing guest room GET that their guest profile prefer and enable them to make more intelligent investments in guest room technologies. Moreover, the results of this study will also show how guests prefer to pay for wireless internet services. This finding may help hoteliers form a well-thought-out Internet service policy.

In conclusion, this study hopes to improve hotel managers' and owners' understanding of guests' perceptions of GET. Even though there has been some research analyzing guests' perception of GET, it will be beneficial for managers and owners to be able to refer to research that focuses specifically on in-room technologies.

Definition of Terms

In this study, the following terms are used:

Guest Empowerment Technologies (GETs): "Electronic systems and tools that allow hotel guests to have more personal control over their stay in a hotel." (Erdem, Schrier, & Brewer, 2009, p. 18)

Mission Critical: "Designating equipment, the correct functioning of which is essential for the fulfillment of a particular task" (Oxford English Dictionary, 2011). In this study, the term, mission critical indicates which guest room technologies are perceived to be essential by the hotel guests for a hotel guest room.

Business Traveler: An individual who travels for business purposes such as "to attend meetings, undertake sales visits, to attend conferences or conventions, to attend trade exhibitions and training or management development courses" (Jones, 2002, p. 27)

Leisure Traveler: An individual who travels for pleasure. (Jones, 2002)

Baby Boomers: People born between 1946 and 1964 (Center for Marketing Effectiveness, 2005).

Gen X: People born between 1965 and 1976 (Center for Marketing Effectiveness, 2005).

Gen Y: People born between 1977 and 1993 (Center for Marketing Effectiveness, 2005).

Chapter 2

Review of Related Literature

Technology and Hotel Industry

Technology allows hospitality organizations to enhance their “internal efficiency and effectiveness” and reinforce their services (Kandampully, 2006). It allows hotels to give innovative and upgraded services to their customers and so helps hotels to improve their customer relationships and to develop “customer loyalty” (Lee, Barker, & Kandampully, 2003) which no other loyalty program can achieve (Center for Marketing Effectiveness, 2005).

While hospitality organizations have begun to appreciate the benefits of the technology, customers have also started to demand the improved service which technology can enable (Lee et al., 2003). Multiple phone lines, interactive opportunities for ordering room service and in-room checkout are a few examples of amenities that guests want to see in their hotels of choice (Wang & Wang, 2009).

To determine the benefits of these technologies for the hotel industry, many studies have been conducted. These studies have mostly examined the perceptions of hotel managers. Van Hoof, Collins, Combrink, and Verbeeten (1995) designed a survey to determine the technology needs and perceptions of hotel managers in the U.S. lodging industry. Their research showed that 92.7 % of managers agreed that technology enhanced the effectiveness of their operations, while 81 % thought that it enhanced customer satisfaction. Lee et al. (2003) also examined hotel managers’ perceptions regarding the impact of technology on overall service and customer loyalty and found that the majority of hotel managers believed that technology enhances service quality,

improves efficiency, contributes to lifting the overall image of the hotel, provides customers with higher value and at the same time creates an opportunity to generate revenue. Another study, conducted in upscale hotels in Turkey to examine managers' perception regarding productivity and competency of information technology, found that hotel managers view guest-related IT applications as highly productive applications and strongly believe that technology improves service quality and manager employee productivity (Karadag & Dumanoglu, 2009).

Guest Empowerment Technologies (GETs)

Guest Empowerment Technologies are self-service technologies specifically designed to give hotel guests more personal control over their stay, independent of the direct involvement of hotel employees. In-room entertainment systems and checkout systems and lobby check-in and checkout kiosks are examples of guest empowerment technologies (Erdem, Schrier, & Brewer, 2009).

The essential aim of GET is to make guests' stay more comfortable while helping to facilitate hotel operation, create new revenue streams, or decrease operation costs (Van Hoof, Verbeeten, & Combrink, 1996).

While GET enhances guests' experience in hotels, they can also provide significant labor savings (Erdem et al., 2009). For example, if an in-room check out system makes checking out easier for guests, a hotel may need fewer front desk agents, saving labor costs (Van Hoof et al., 1996). Since the staff will have more available time, the hotel can assign additional tasks to them which will help to improve guest service and guest satisfaction (Erdem, et al., 2009).

Moreover, GET can also contribute in revenue. For example, when a guest is watching a football game, a pop-up ad may appear asking the guest if they would like a soda or beer. The guest can then place his or her order by clicking on the ad. Such a system not only supports interaction with the guests but also creates a new sales point for the hotels.

Even as guest empowerment technologies provide many advantages to hotels, the guests' interest in these technologies continues to grow. Today, providing GET to the hotel guests gives hotels a considerable competitive advantage. In a study reported by Hospitality Magazine, customers stated that they would be more likely to stay in a hotel offering check out kiosks (Mastroberte, 2011).

Guests may see guest empowerment technologies at two levels in hotels: at the operational and managerial level and at the guest room services level (Lee et al., 2003).

Guest Room Technologies

A study conducted among guests of multiple hotel classes shows that the guest room is the most important factor affecting the guest's hotel stay satisfaction, more important than other service criteria such as arrival considerations or food and beverages (Hotel Online, 2000).

To enhance guests experience in the room, many hotels offer in-room technologies such as wired and wireless internet, technologically advanced televisions, gaming consoles and online check-in and checkout options (DiPietro, & Wang, 2010). In this part of the paper, some of the in-room technologies will be evaluated in detail.

Flat Screen TVs

Hotels all over the world are placing flat panel displays in their guest rooms, replacing the huge and expensive TV cabinet. Most of the flat panel digital displays in hotels use either plasma or LCD (liquid crystal display) technology. However, to provide digital movies in the guestrooms, hotels also need to have a high-quality digital signal. In addition to showing movies, flat panel displays have many other functions. Guests can connect their laptops to them for a larger desktop display. If the hotel provides both high-speed internet access (HSIA) and a wireless keyboard, guests without laptops can also use the flat-panel display to connect to the Internet in their rooms. Guests can also use this system to access hotel-specific information, make dining reservations, order room service, request wake up calls, access concierge services, check their group's conference or meeting agenda and room location, view diagrams of the resort layout and focus on specific attractions, view folio information and check out. Moreover, during the times when the guests do not use them, Flat Panel Displays can be used as decorative object, displaying artwork or they can function as a mirror (Inge, 2006).

Speakers

Most displays have their own high-quality "built-in speakers" or can be connected to a "5.1 theater-style surround-sound set up" for a better sound quality (Inge, 2006).

Phones

New guest room phones have "guest focused visual displays," either inherently as a VOIP unit like those of Cisco and Teledex, or as part of a "guestroom multipurpose control unit" like InnCom GDA-700. To make these phones more cost efficient, their screens are designed to be small, averaging about 5.5 inches, with a touch screen instead

of a keyboard . However, these small screens provide access to concierge information in categories predetermined by the hotel, such as weather, travel, sports, local events or local restaurants (Inge, 2006).

Electronic Locks

There are several kinds of electronic locks, including biometric control locks and proximity locks. While biometric controls such as fingerprint or iris recognition are easy to use, hotels using that kind of lock should offer another option for guests who prefer not to register their physical characteristics. Moreover, storing guests' biometric information securely adds an additional burden on the hotels using this system.

Proximity Locks work with keycards that include a small “radio-frequency ID (RFID) transmitter.” Guests do not need to insert the key into the lock; instead, the lock identifies the key when they bring it closer to the lock. Hotels that wish to have more control over user access may prefer smart cards. Because these cards include small chips and memory, they can record which locks the card has been used to open (Inge, 2006). In addition to electronic locks, some hotels offer the convenient use of mobile phone technology for guest room lock access. In this system, the hotel sends an e-mail to the guest before arrival, including “acoustic noises” that are unique to a particular guest room lock. The lock recognizes the noises so that guests can unlock it, enabling guests to go directly to their rooms without stopping by the reception (Volpe, 2011). Even though it requires an initial investment, hotels which have these systems see a decrease in cost over that of using “physical key card systems” (Erdem et al., 2011).

In-Room Safes

Many hotels provide in-room safes to their guests as a room amenity. To lock these safes, guests can use a PIN code that they determine, or swipe their credit cards. There are also some safes which work by swiping the guestroom keycard or by recognizing the fingerprint of the guest. However, with fingerprint-recognition safes, hotels face the same problem that emerges when this system is used for guestroom keys: guests often prefer not to provide their fingerprints and the hotel may prefer not to take the responsibility of storing them (Inge, 2006).

Minibars

Minibars continue to be improved with new “management software,” better “cooling systems” and “self-monitoring of their maintenance status.” Minibars using centrally managed systems allow for a correct and actual time recording of minibar expenditures to the guest folio and decrease labor costs by informing the staff when an item is consumed, eliminating the need for daily minibar checks (Inge, 2006).

Connectivity Panel

Today, more and more guests carry personal digital devices such as laptops, MP3 players, digital cameras, camcorders, cell phones, gaming devices and other electronic equipment with them when they travel, and would like to use them in their hotel room. Through connectivity panels, guests can connect these devices to the existing guest room technology without the trouble of trying to connect a cable to the specified socket of TV or speaker. Therefore, it improves the guests’ experience in the room by making the use of personal devices more convenient. However, making it easy for guests to use their personal devices may cause hotels to lose the revenue gained from pay-per-view movies,

sports packages, games, music, comedy specials and other entertainment offerings (Rock, 2008).

All-in-One Guest Room Control Units.

All in one guest room control units, ideally with a single remote control, allow guests to control all existing systems, from lighting and room temperature systems to television and video systems, in the guest room (Inge, 2006). It may also enable the guests to schedule wake-up calls and request for some services such as housekeeping and room service (Control 4, n.d).

High-Speed Internet Access.

The internet is one of the most important amenities that guests look for in a hotel (Karadag & Dumanoglu, 2009; Lee et al., 2003). According to the national audience survey of Hotel Business In Focus/OnLine (2008), in-room high-speed internet is a must not only for business travelers but also for leisure travelers. While leisure travelers spend two or more hours per day using the Internet during their trips, business travelers spend four or more hours per day. Travelers use the internet mostly to access their work or personal emails as well as local area information. Many travelers have stated that they will not stay in a hotel that does not provide high-speed internet access (Hotel Business Infocus Online, 2008).

For almost all segments of hotel guests, wireless internet access is the most important amenity among all other favored amenities, including items such as complimentary breakfast, free parking and bedding and pillow choices (Greif, 2010). According to another survey that Hotel Internet Services conducted with 1,800 hotel guests, almost ninety percent of participants think in-room internet is very important.

More than sixty-five percent of participants stated that availability of in-room internet services affects their decision very much when choosing a hotel, and more than seventy percent indicated that they preferred wireless internet rather than wired. Weak internet connections, disconnections and poor speeds are the problems that guests most frequently faced. (Hotel Internet Services, n.d.)

While the majority of mid-scale and economy hotels offer complimentary internet to their guests, only few upscale and luxury hotels do this. Studies show that complimentary internet increases guest satisfaction. When guests have to pay for the internet and experience a problem with it, their dissatisfaction become very high. However, hotels don't want to give up the Internet revenue which still makes up a large part of their revenue flow. It is likely that that until one of the luxury or upscale hotel brands lead the other hotels by not charging for the internet, guests will have to continue to pay for internet access in these hotels (Greif, 2010).

Bandwidth

Bandwidth can be defined as “the amount of data transmitted over a network connection during a given time” (iBAHN, 2010). In the early stages of high speed internet, hotel guests, most business travelers were using the internet to check e-mails or browse the Internet, so the bandwidth that hotels provided (T1) was enough. However, today both business and leisure travelers use the Internet for many purposes which are “bandwidth intensive,” including to download or stream movies, participate in video conferences, or play games (iBAHN, 2010).

Moreover, while until recently families tended to bring only one laptop with them, it is more likely today for multiple members of a family to carry portable devices such as

the iPad and iPhone (Edwards, 2010). Therefore, to meet the guests' demand for more bandwidth, hoteliers have needed to improve bandwidth in their hotels (iBAHN, 2010). To organize bandwidth usage, hotels may follow a number of different policies. They may restrict bandwidth-intensive websites such as movie downloading websites, or they may limit the maximum usage of bandwidth. Another strategy is offering complimentary internet for low-bandwidth activities, but charging for a larger bandwidth (Terry, 2011). Unfortunately, hotels cannot determine their bandwidth needs based on the number of guest rooms. When choosing their bandwidth plan, hotels should first decide what kind of "bandwidth experience" they want to provide to their guests. After choosing a bandwidth plan, hotels should investigate bandwidth usage for a while and if necessary, add more bandwidth or make other arrangements (Terry, 2011).

Hotel Guests: Leisure and Business Travelers

According to research conducted by the American Hotel & Lodging Association, (2010), in 2009, 40 % of hotel guests traveled for business and 60 % traveled for leisure purposes. Business travel is defined as "all non-discretionary trips which occur either explicitly for the purpose of engaging in work, or incidentally in the course of conducting work-related activities." Business travelers travel for "the company management to attend meetings, undertake sales visits, to attend conferences or conventions, to attend trade exhibitions and training or management development courses" and 64 percent of them stay in hotels in these trips (Jones, 2002). According to statistics compiled by Oxford Economics USA (2009), business travel in the U.S. creates \$246 billion in spending and 2.3 million American jobs.

The key decision factor of business travelers can be summarized as “a business setting in comfortable surroundings.” This business setting must involve efficient and satisfactory business facilities. The hotel should create “the office away from home” for its business guests (Jones, 2002, p.27).

On the other hand, an increasing number of people travel for leisure (Center for Marketing Effectiveness, 2005). Almost 36 % of the total accommodation demand of the world is leisure based (Jones, 2002).

Business travelers and leisure travelers are assumed to have different demands (Radder & Wang, 2006). However, expectations and needs of the guests can change rapidly. In the past, guest room technologies for the business travelers have disregarded leisure travelers. For example, in-room high speed internet was until recently considered a must mostly for business travelers. However, many of today's leisure travelers carry their laptops with them when they are traveling and increasingly demand in-room high-speed internet (Center for Marketing Effectiveness, 2005).

Today, the demands and needs of both business and leisure travelers are shaped by technology (Center for Marketing Effectiveness, 2005). Hotel guests use an average of 167 minutes of wireless internet (iPass Mobile Broadband Index, 2008). Ninety-five percent of hotel guests turn on the TVs in their guest rooms and watch an average of three hours per day during their stay (Ostrowski, 2006). Moreover, 95 % of hotel guests took personal electronic devices with them while traveling and 67 % want to use personal electronic devices with the hotel entertainment system. Forty-six percent of guests, listened to music from personal Mp3 players using an in-room system (Hotelmktg, 2008).

Generation and Technology Usage

Three generations, Baby Boomers (born between 1946 and 1964), Gen X (born between 1965 and 1976) and Gen Y (born between 1977 and 1993) make up the majority of today's hotel guests (Center for Marketing Effectiveness, 2005). In the past, hotels have used all their efforts and market channels to attract baby boomers but today, as Gen Y and Gen X have begun to travel more, hotels have to concentrate on these younger segments of the population (Lussan, 2009).

While hoteliers see Gen X as the “guest of the future,” Gen Y attracts the hoteliers' attention with its considerable size (Center for Marketing Effectiveness, 2005). To appeal to this young market, hotels should first change or add to their communication channels. However, changing communication channels is not enough; hotels need to change their whole business strategy. Hoteliers cannot appeal to these younger customers using the policies created for baby boomers (Lussan, 2009).

Technology is one of the most important features of this changing strategy. Unfortunately, there is no one technology which will be suitable to all generations. Different generations have different needs and wants, so that they have different technology preferences (Center for Marketing Effectiveness, 2005).

Baby boomers were exposed to many currently important technologies only after their middle age. They tend not to like complicated devices with many features, and to prefer that their technological devices are user-friendly and flexible. They are more likely to consider a device useful if they are able to learn how to use it and can fix its problems. Contrary to predictions, baby boomers are largely open to new technologies. They believe that technology has helped to improve their lives and society. However, they are

less likely to become “early adopters” of a technology unless they believe that it will meet their needs directly and make their lives easier. Like other generations, they want technology to meet their needs. Safety and privacy is generally more important for them than for other generations (AARP & Microsoft, 2009).

On the other hand, Gen X and Gen Y were exposed to today’s essential technology when they were younger than baby boomers. Even though technology means a lot for both Gen X and Gen Y, they see the technology from different perspectives. Gen X utilizes technology to enhance their lives. They mostly do online shopping, and use online banking. However, since Gen Y has largely been surrounded by current technology during their whole lives, technology is a part of their life. They use technology not only to entertain but also to socialize. Ninety percent of Gen Y has own PC and eighty two percent of them own a mobile phone (Forrester Research, 2008). Since Gen Y tends to be more demanding and less loyal, it is more difficult for hoteliers to satisfy Gen Y than any other generation (Alcatel Lucent, 2009; Barsky & Nash, 2007). Television and Internet are the technologies that baby boomers mostly use (Center for Marketing Effectiveness, 2005). However, Gen X and Gen Y guests tend to prefer that their hotels offer more cutting edge devices, including high-speed internet, Tivios and iPads (Lussan, 2009).

To appeal to all generations, hotels should be aware of the differences in technology preferences across generations and provide different technological devices that will suit each generation (Center for Marketing Effectiveness, 2005).

Can Guests Use The Technology in Hotels Effectively?

Having guest-operated technology such as an in-room interactive television which allows guests to access concierge services and personal messages and to place in-room dining orders, buy in room movies, and check out, may create a competitive advantage for hotels. However, whether guests appreciate these technologies or hate them depends on whether or not these devices are user friendly (Van Hoof et al., 1995).

Paul Grimes (1991) describes this situation in his article, “As the hotel business becomes more complex, I appreciate the importance of technology in keeping it afloat. But I want this technology to be a friend of my readers-your guests- and not an adversary with which they must cope.” (p. 38)

The study conducted by that Van Hoof et al. (1995) to examine technology needs and perceptions of hotel managers in U.S. lodging industry showed that only 39.9 % of managers believe that guests use guest empowerment technologies effectively. However, 64 % of managers whose hotels actually have these devices felt that their guests used them effectively. One year after this study, the same researchers conducted an additional study to examine international technology needs and perceptions, verifying their previous findings. The study showed that hotel managers around the world do not believe that the guests use the guest empowerment technologies effectively (Van Hoof et al., 1996).

Technology Acceptance Model

Technology Acceptance Model (TAM) is mainly derived from Fishbein and Ajzen’s Theory of Reasoned Action (TRA) (1975), which focused on “an individual’s behavior as a positive function of his behavioral intention to perform the behavior” (Wu & Wu, 2005). TAM examined technology usage behavior and analyzed the variables of

technology acceptance (Davis, 1989). It hypothesized that behavioral intention to use is the main determinant of technology usage. It found that behavioral intention to use was determined by a user's attitude toward using technology and the perceived usefulness (PU) of that technology, which is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance." Moreover, these studies showed that Perceived Ease of Use (PEOU), which is "the degree to which a person believes that using a particular system would be free of effort," had a significant effect on the user's perceived usefulness (Davis, 1989; Davis, 1993). If two systems perform exactly the same functions, the user will assume that the one that is more user-friendly is more useful. That is, by designing a system to be more user-friendly without changing anything else, the system can be made more useful (Davis, 1993)

Mission Critical Technologies

According to the Oxford English Dictionary (2011), mission critical means "equipment, the correct functioning of which is essential for the fulfillment of a particular task." A breakdown of mission critical equipment may cause a breakdown in the operation of the organization (Business Dictionary, 2011).

Mission critical technologies create vital advantages for an organization. Organizations depend on these technologies because they perform significant functions for the organizations' success. Generally, the most significant technologies of the organizations are called "mission critical" (Oakes, 2005).

For the purposes of this study the term 'mission critical technology' refers to the technologies perceived to be important by the hotel guests for the hotel guest room.

Mission Critical Technologies in Hotels

Hoteliers' Perception

To determine “the technology information gaps” for its members, American Hotel Association conducted a survey in 2008. Respondents were mainly hotel managers and directors with more than ten years experience in the hospitality industry. According to this survey, hoteliers believe that the most important IT goals are enhancing the guest experience (82.4 %), increasing employee efficiency (79.9%), and generating revenue (71.9%) (Brewer, Kim, Schrier, & Farrish, 2008).

This research also revealed which technologies hoteliers think that hotel guests care about most. Eighty-two percent of respondents believed that WiFi services are the most important technology for guests, and 48 % think that in-room entertainment systems are the technologies that the guests care about most. Twenty-five percent or more respondents named boarding pass printing (38%), infrastructure for handheld devices (27%), and Internet kiosks in the lobby (25%) as the most important technologies for guests. In-room check out systems (16%), online check in/out (11%), VOIP (10%), wireless check-in available offsite (9%), check-in/out kiosks (7%), support for Slingbox (5%), biometrics for payment/security (4%), and RFID (3%) are the other technologies that hoteliers considered important for their guests (Brewer et al., 2008).

The findings of this study also show that hoteliers give priority to technologies that they believe their guests care about the most. Eighty-six percent of respondents stated that they offered WiFi services to the guests in their hotels. Moreover, 47 % and 36 % of the hotels planned to offer in-room entertainment systems and airline check-in kiosks, respectively. This research also demonstrates that chain hotels and hotels

attracting business travelers utilize or aim to utilize guest empowerment technologies more (Brewer et al., 2008).

In 2010, another study was conducted to determine hotel IT trends for 2011 (Erdem, Nusair, & Schrier, 2011). One hundred and fourteen hotel executives responded to the survey. While 48 % of the respondents were managers of information technologies, the rest were the managers of the other primary departments such as finance, marketing and human resources. The study found that cost saving and revenue generating are the main goals of hotel executives (97%) who invest in lodging technology. These are followed by enhancing guest services (93%) (Erdem et al., 2011).

Erdem et al. (2011) also determined which in-room technologies hotel executives tend to think should take priority in investment. Not surprisingly, wireless internet service was named as the most important technology to invest in by hotel executives (89%). Moreover, more than seventy percent of respondents cited flat screen television (83%), high definition television content (75%), increasing bandwidth to guest rooms (73%) and energy management (72%) as important investment areas. However, only eight percent of respondents thought that 3D television is an important technology to invest in. The researchers of the study believe that relative newness of 3D technology, its high cost, and low guest demand lie behind this finding. In addition, in this survey, seventy eight percent of executives stated that guest room technologies are the IT project which has higher priority in 2011 (Erdem et. al., 2011).

Guest Perceptions

To examine the importance of in-room technologies for guests and the performance of those technologies, Beldona and Cobanoglu (2007) conducted a survey of

265 people who had stayed in a hotel within the last 12 months for business or leisure purposes. In this study, the researchers analyzed the importance of 24 guest technologies and the guests' satisfaction with those technologies.

Their survey found that express check-in and checkout, remote control TV and high-speed internet access were very important technologies for the respondents. The respondents also rated the performance of these technologies highly. Wireless Internet access, alarm clock, easily accessible electrical outlets and online reservation capabilities were cited as important technologies by participants, but they were not satisfied with the performance of these technologies (Beldona & Cobanoglu, 2007).

On the other hand, respondents rated web TV, pay per view and in-room personal computers as having low importance, even though they perform well. Videoconferencing capabilities, wireless access to hotel web site, business centers, and plasma screen TVs are other technologies that respondents rated as less important that also performed unsatisfactorily.

Research has also examined the differences in the perception of the importance of the guest room technologies between business and leisure travelers. It found that, overall, guest room technologies are more important for the business traveler than for leisure travelers. More specifically, business center, portable or speaker phone in room, voice mail, easily accessible electrical outlets, additional data line accessible to desk, high-speed internet access, wireless internet access in hotel, in-room personal computer, in-room fax machine, in-room printer, and plasma screen TV are all more important technologies for the business traveler than for leisure travelers. The differences are statistically significant (Beldona & Cobanoglu, 2007).

Importance-Performance Analysis

Because hotel guests demand more technologies in their guest rooms, many hotels have made a huge investment in guest room technologies (Erdem, et. al., 2011).

However, not all technologies have the same level of importance for guests. Hotel operators should be aware when purchasing GET which GETs are considered more important by their guests. Importance-Performance analysis helps hotel managers and owners to evaluate both the perceived importance of different GETs for their guests and the performance of these GETs.

Importance-performance analysis (IPA) became more popular after Martilla and James' study (1977) suggested IPA as a clear and cost effective technique for developing management strategies. In their study, Martilla and James (1977) first determined 14 automotive service attributes that influence "service department patronage." They then evaluated the importance and performance of these attributes by asking customers "how important each attribute was" and "how the dealer performed each attribute." They displayed the results of the survey on an IPA two dimensional grid using mean values of importance and performance ratings as the crossing point. After Martilla and James' study (1977), IPA was applied to a wide range of areas, from tourism and education to healthcare marketing (Beldona & Cobanoglu, 2007).

Chapter 3

Methodology

Sampling and Data Collection

The targeted population of the study was hotel guests nationwide who were older than 18 years old and have stayed in a hotel in the past twelve months. To reach this population, the database provided by the Utah-based online research company Qualtrics was used. Qualtrics is a research company which enables users to build a survey on its website and helps to distribute it to its database quickly and efficiently. Probability sampling was utilized for this survey. The participants in the database were selected randomly. A link to the self-administered survey was sent to potential participants' email addresses. The first question of the survey asked the potential participant whether he or she had stayed in a hotel at least once in the past twelve months. Participants who answered no to this question were led to the end of the survey, so that only those participants who answered this question positively could take the whole survey. The data was collected between October 20, 2011 and October 25, 2011. Among 745 people who started the survey, 697 of them completed it. 508 of these 697 people have stayed in a hotel at least once in the past twelve months.

Questionnaire Development

A survey (see Appendix 1) was designed to identify mission critical technologies as perceived by hotel guests. Respondents were asked to rate the importance and performance of the 18 in-room GET most prominent in the literature. Table 1 shows which in-room GET were examined:

Table 1

Examination of In-Room Guest Empowerment Technologies

In-Room Guest Empowerment Technologies	
1.	In-room check out system through TV
2.	In-room video viewing of guest portfolio
3.	In-room movie on demand services
4.	In room video gaming on demand services
5.	In-room wireless high speed internet access
6.	High-definition television content
7.	3D television
8.	Ability to use increased bandwidth
9.	Internet on TV
10.	Guest Room Lock Access via guest's mobile phone
11.	In room temperature control
12.	New technology phones with visual displays
13.	In-room electronic safes
14.	In-room computers
15.	In-room printer
16.	Voice mail
17.	Connectivity panels (plugging games, laptop, etc. into an HD TV)
18.	All-in-one guest room control units

The survey was composed of five sections. The first section included demographic questions such as age, gender, education level and income level. Some accommodation-related questions regarding how frequently participants stay in a hotel in a year and what type of hotel they prefer were also added to this part, as well as several questions to investigate whether the quality of guest room technologies influences the participants' decision when choosing a hotel, whether they are willing to pay extra for a guest room which has current in-room technologies, and their internet payment preferences.

Martilla and James (1977) suggested grouping all importance questions in one section and all performance questions in another section. They argued that this method might prevent responses to the importance questions from affecting the answers to the performance questions. Therefore, in this survey, all importance questions and all performance questions were grouped in different sections. In the second section, participants were asked to rate the importance of the given 18 in-room guest empowerment technologies, and in the third section of the survey they were asked to rate the performance of these GET. The fourth section asked respondents to rate how frequently they used these eighteen GET during their stay in a hotel. In the fifth and final section, participants were asked how many hours per day they spend watching TV while in a hotel guest room and whether they believe that having an interactive TV in a hotel room enhances their experience as a hotel guest.

Prior to the data collection, a pilot test was conducted. The survey was conducted using thesis committee members and graduate students majoring in hotel administration at the University of Nevada, Las Vegas. The survey was then revised based on feedback

from the pilot test participants. Some of the questions were rewritten to ensure clarity and several questions were added to measure the variables more in detail. Because some of the pilot tests participants did not understand what was meant by a few in-room technologies, such as the connectivity panel, explanations were added for each of these technologies.

Tools for Analysis

Importance and performance analysis was utilized in the development of a scale to determine mission critical in-room technologies for hotels. The IPA makes it possible to create a “two-dimensional grid” based on high or low importance and terrible or excellent performance (Martilla & James, 1977).

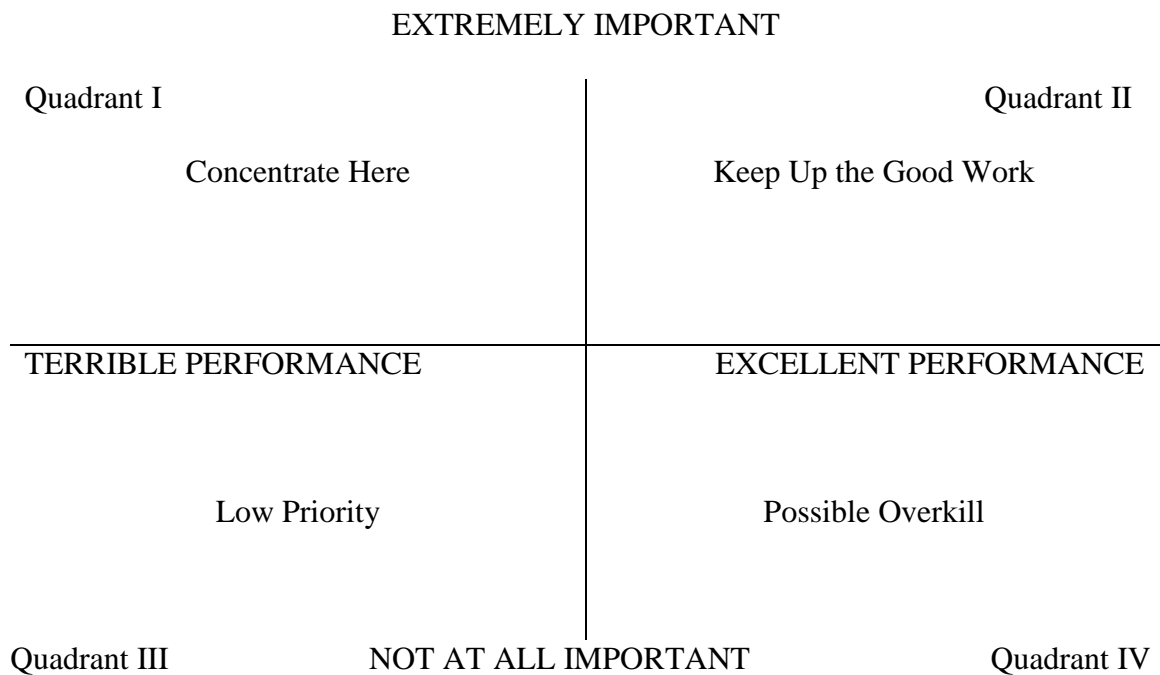


Figure 1. Importance – performance grid. Adapted from “Importance Performance Analysis” by J. A. Martilla and J. C. James, 1977, *Journal of Marketing*, 41, p. 78.

Each of the 18 technologies was given a place on the grid according to the results of the survey. The medians and means were calculated for importance and performance. As Martilla and James (1977) recommended, because the medians and mediums were fairly close, mean values were used to separate the quadrants. The importance-performance grid shows which technologies are important for the guests surveyed and which technologies they believe to be performing satisfactorily. Therefore, it indicates to hotel operators which technologies they should invest in the most (Beldona & Cobanoglu, 2007).

The technologies which fall in Quadrant I on the importance performance grid are of high importance to guests but offer low guest satisfaction. Hotel operators should concentrate on these technologies. Quadrant II indicates the technologies that guests think are important and with which they are satisfied. Regarding these technologies, hotel operators should “keep up the good work.” The technologies in the Quadrant III are shown to have both low importance and low performance. Because guests do not tend to see them as important, hotel operators do not need to invest in them very much. The other low importance section is Quadrant IV. While the performance of the technologies in this section is rated as high, their importance for guests is low.

On the importance scale (section two of the survey), a seven-point likert type importance scale was used where 7 indicates Extremely Important and 1 indicates Not At All Important. Respondents were informed that selecting Extremely Important (7) means that the particular technology is a must-have during any hotel stay and crucial to the selection of a hotel. Selecting Not At All Important (1) means that the technology in question is not at all useful or needed during a hotel stay.

For the performance scale, a seven-point likert type performance scale was also used. Seven indicated excellent performance and 1 indicated terrible performance.

In the section in which hotel guests are asked how frequently they use the eighteen technologies during their stay in a hotel, a five-point likert type frequency scale was used. A rating of 1 indicates that the guest never uses the given technology; 5 indicates that he or she uses it very frequently.

Analysis of Data

Throughout the pre-process, incorrect sampling units and non-responses were eliminated to ensure consistency. After the pre-process, data collected from the survey was transferred to SPSS 18.0 and Minitab 16. To search for errors in data entry and missing data, descriptive statistics were conducted. To investigate the relationships between technology preferences and purpose of travel, as well as between technology preferences and generations, two-way ANOVA and Turkey's post hoc tests were conducted. Moreover, one-way ANOVA and Tukey's post-hoc tests were utilized to examine whether travel frequency has an effect on respondents' perception of in-room technologies.

Chapter 4

Findings

Demographic Information

Table 2 shows the demographic information of the sample. It indicates that slightly more than half of the respondents (51.20 %) were female. Almost one quarter of the respondents (24.41 %) were between 47 and 57 years old; 10.43 % ranged between 18 and 28; 13.39 % between 29 and 34; 22.83 % between 36 and 46; 19.29 % between 58 and 65, and only 1.77 % were older than 75 years. The majority of the respondents (64.57 %) were married and about 20 % of them were single. About 30 % of the respondents have some college degree, while 27.95 % have a bachelor of sciences/arts degree and almost 10 % have a master degree. About 47 % of the respondents reported being employed full time; 13.78 % worked part time; 19.29% were retired, and 13.58 % were unemployed. About 22 % of the respondents earned less than \$36,000 per year; 15.35 % reported an annual income of \$36,000 to \$48,000; 15.75 % earned \$ 48,001 to \$ 60,000; and 12.01 % of the respondents reported earning more than \$108,000.

According to 2010 census results, 49 % of the population is male, while 51 % is female. 20 % of the population is between 20 and 34 years old, 13% ranged between 35 and 44; 30 % between 45 and 65 and 12 % of them are older than 65 years. Around 56 % people living in US who are older than 15 years are married. Almost 31 % of the population have high school diploma, 18 % have a bachelor's degree and 6.6 % have a master's degree. (US Census Bureau, 2010). Overall distribution of demographic characteristics of respondents in this study is somewhat similar to that in US population.

Table 2

Respondent Demographics

Variable	%	Variable	%
Gender		Employment	
Male	48.80	Full Time Employed	47.05
Female	51.20	Unemployed	13.58
Age (years)		Retired	19.29
18-28	10.43	Part Time Employed	13.78
29-34	13.39	Other	5.12
35-46	22.83	Prefer not to answer	1.18
47-57	24.41	Annual Household Income	
58-65	19.29	Less than \$ 36,000	22.24
66-75	7.87	\$ 36,000- \$ 48,000	15.35
Above 75	1.77	\$ 48,001- \$ 60,000	15.75
Marital Status		\$ 60,001- \$ 72,000	10.83
Married	64.57	\$ 72,001- \$ 84,000	9.84
Widowed	2.95	\$ 84,001- \$ 96,000	7.87
Divorced	8.86	\$ 96,001- \$ 108,000	5.71
Separated	1.57	More than \$ 108,000	12.01
Single	19.88	Prefer not to answer	0.39
Other	1.97		
Prefer not to answer	0.20		
Levels of Education			
Less than High School Diploma	0.98		
High School Diploma	17.13		
Some College	29.92		
Trade/Technical School	10.63		
Bachelor of Sciences/Arts	27.95		
Master Degree	9.45		
JD	0.59		
PhD	0.98		
Other	1.57		
Prefer not to answer	0.79		

Note. N= 508

Travel Behavior

Table 3 shows the travel behavior of the respondents. Almost 80 % of the respondents reported that their last stay in a hotel was for leisure; only 9.25 % were business travelers. 40 % stayed in a midscale hotel during this trip; almost 30 % stayed in an upper midscale hotel; and 15.16 % stayed in an economy hotel. While 8.07 % stayed in an upscale hotel, only 2.56 % of them reported having stayed in a luxury hotel. Slightly less than one quarter of the respondents (24.41 %) stayed in a hotel twice a year, 22.83 % stayed in a hotel three times a year, while 14.76 % stayed in a hotel five times in a year.

Table 3

Travel Behavior

Values	%	Values	%
Purpose of trip		Frequency of staying in a hotel	
Leisure	79.53	Less than once a year	4.92
Business	9.25	Once a year	13.58
Business and Leisure	7.68	Twice a year	24.41
Other	3.15	Three times a year	22.83
Prefer not to answer	0.39	Four times a year	15.35
Hotel type		Five times a year	14.76
Luxury (ex.Ritz Carlton)	2.56	Other	3.74
Upscale (ex.Grand Hyatt)	8.07	Prefer not to answer	0.39
Upper Midscale (ex.Hilton)	29.13	# of nights	
Midscale (ex.Courtyard)	39.96	1-2 Nights	54.50
Economy (ex.Motel 6)	15.16	3-4 Nights	26.75
Other	5.12	5-6 Nights	9.30
		More than 6 nights	6.70
		Prefer not to answer	2.75

During their last hotel stay, 54.5% of respondents stayed 1 or 2 nights; 26.75 % stayed 3 or 4 nights; and 18.25 % stayed more than 4 nights in the hotel. This travel

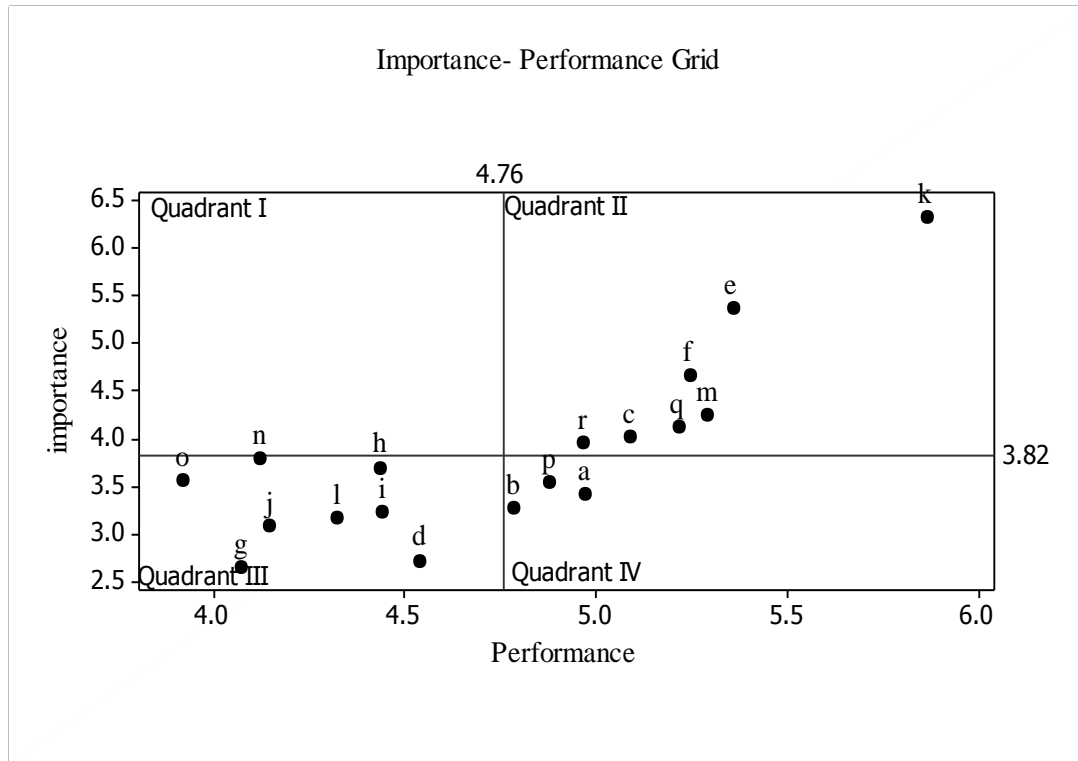
behavior seems to be consistent with AH&LA's (2010) statistics, in which the majority of guests stayed 1 or 2 nights in a hotel.

Which in-room GET are mission critical for hotel guests?

To answer this research question, the importance performance analysis was utilized. IPA grid (see Figure 2) displayed how technologies are important and how they perform in an easy way to understand.

The findings of importance- performance analysis showed that 7 of 18 in-room technologies - in-room movie on demand services, in-room wireless high speed internet service, high definition television content, in-room temperature control, in-room electronic safe, connectivity panels, and all in one guest room control unit- fell in Quadrant II. Participants think that these technologies are important and they are also satisfied with the performance of these technologies. Therefore, these technologies help hoteliers increase guest satisfaction. Hoteliers should keep these technologies and sustain the high performance of these technologies.

In-room check out system through TV, in room video viewing of guest profile, and voice mail are the other technologies that respondents think have high performance, but these are seen as less important. Hoteliers may allocate the budget of these technologies to other technologies considered more important by guests, such as the technologies in Quadrant II.



- | | |
|---|---|
| a | in-room check out system through TV |
| b | in-room video viewing of guest portfolio |
| c | in-room movie on demand services |
| d | in room video gaming on demand services |
| e | in-room wireless high speed Internet access |
| f | high definition television content |
| g | 3D Television |
| h | ability to use increased bandwidth |
| i | Internet on TV |
| j | guest room lock access via guest's mobile phone |
| k | in-room temperature control |
| l | new technology phones with visual displays |
| m | in-room electronic safes |
| n | in-room computers |
| o | in-room printer |
| p | voice mail |
| q | connectivity panels |
| r | all-in-one guestroom control units |

Figure 2. Importance-performance analysis grid of examined 18 in-room technologies. In importance scale, 1 indicates not at all Important and 7 indicates extremely important. In performance scale 1 indicates terrible performance and 7 indicates excellent performance.

The majority of the technologies – in-room video gaming on demand services, 3D television, ability to use increased bandwidth, Internet on TV, guest room lock access via guest's mobile phone, new technology phones with visual display, in room computers, in-room printers are in the Quadrant III. Guests neither think that these technologies are important, nor are they satisfied with their performance.

Fortunately, there is no technology in Quadrant I which has high importance and low performance. The respondents were satisfied with the performance of all technologies that they think are important. All technologies rated as important also meet guest expectations.

Based on the findings of IPA, in-room movie on demand services, in-room wireless high speed internet service, high definition television content, in-room temperature control, in-room electronic safe, connectivity panels, and all in one guest room control unit are the most important technologies for the participants. Since these technologies are important for them, guests would prefer to have them in their guest room. These technologies have the function of increasing guest satisfaction for hotels. A hotel that offers these technologies will gain an important competitive advantage. Therefore, we can say that the participants of this study perceived these technologies as mission critical for hotels.

Which guest room entertainment technologies are important for guests?

Among the entertainment technologies -in-room movie on demand services, in room video gaming on demand services, 3D television, Internet on TV, and connectivity panel- IPA analysis showed that connectivity panel and in- room movies on demand services are the most important for respondents.

Of the identified GET, which ones do guests use most frequently?

To analyze whether there are significant differences in usage frequencies of technologies one way ANOVA was conducted between the technology types (independent variable) and the usage frequency score of each technology (dependent variable). The results of one way Anova tests showed that there are significant differences between the usage frequency of technologies across the technology types ($F=139.39$, $p < 0.05$) To compare the means of usage frequency scores of technologies and investigate which technologies guests use most frequently, Tukey's test was utilized.

Table 4

Frequency Usage of In- Room Technologies

Technology	N	Mean	StDev
in-room check out system through TV	348	2.448	1.458
in-room video viewing of guest portfolio	345	2.258	1.349
in-room movie on demand services	451	2.492	1.239
in room video gaming on demand services	404	1.683	1.044
in-room wireless high speed Internet access	463	3.592	1.453
high definition television content	426	3.404	1.311
3D Television	282	1.557	1.060
ability to use increased bandwidth	340	2.206	1.401
Internet on TV	314	1.793	1.222
guest room lock access via guest's mobile phone	286	1.633	1.152
in-room temperature control	481	4.393	0.975
new technology phones with visual displays	286	1.822	1.196
in-room electronic safes	380	2.868	1.530
in-room computers	267	1.88	1.332
in-room printer	257	1.735	1.225
voice mail	370	2.23	1.341
connectivity panels	356	2.652	1.548
all-in-one guestroom control units	314	2.424	1.470

In-room temperature control unit, in-room wireless high speed internet access, and high definition television content are the technologies that were used significantly

more frequently by respondents during their last hotel stay. Not surprisingly, IPA analysis above also shows that these technologies were rated as the most important technologies by the participants.

Are there differences in guests' GET preferences and expectations across generations as well as purpose of travel?

Two of research questions “Are there differences in guests' GET preferences and expectations across generations” and “Are there differences in guests' GET preferences and expectations across purpose of travel” were analyzed together using two-way ANOVA which was conducted to estimate a model with the importance score of each technology as the dependent variable and the generation and the purpose of travel as the independent variables (see Table 5).

To analyze whether there are differences in guests' GET preferences and expectations across generations, age groups were first coded according to the generations to which they belonged. The respondents whose ages were between 18 and 34 coded as Gen Y; the ones between 35 and 46 years old were coded as Gen X; the respondents whose age ranged from 47 to 65 were coded as Baby Boomers; and respondents who were older than 65 were coded as the Silent Generation.

The comparisons of the means for the importance of technologies indicated that the importance of many technologies were higher for Gen Y than other generations. This finding is consistent with previous studies indicating that Gen Y is the most technology savvy generation (Forrester Research, 2008; Center for Marketing Effectiveness, 2005).

The results of the tests showed that in- room video gaming on demand ($F= 12.74$, $p < 0.05$), guest room lock access via guest's mobile phone ($F=7.53$, $p < 0.05$), and new

technology phones with visual displays ($F=9.13$, $p < 0.05$) were significantly more important for Gen Y than for all other generations. Gen Y also ascribed significantly greater importance to high definition television content ($F=3.99$, $p < 0.05$), 3D television ($F=4.46$, $p < 0.05$), ability to use increased bandwidth ($F= 7.08$, $p < 0.05$), and internet on TV ($F= 8.42$, $p < 0.05$) than baby boomers and the generation older than baby boomers, silent generation. In room electronic safes ($F= 4.77$, $p < 0.05$) and all in one control units ($F=4.22$, $p < 0.05$) are the other significantly more important technologies for Gen Y than silent generation.

In room video gaming on demand services, 3D Television, and ability to use increased bandwidth and internet on TV were significantly more important in-room technologies for Gen X than for the silent generation. Except for connectivity panels, the importance score of none of the technology showed significant difference between Gen X and baby boomers. The importance scores of the connectivity panels ($F= 21.63$, $p < 0.05$) showed significant differences among all generations in that younger generations gave significantly more importance than the older ones. The reason might be that younger generations are more likely to have more personal devices which they might plug into the connectivity panel than older ones (Center for Marketing Effectiveness, 2005).

While there is no significant differences were found in the importance rating of in-room movie on demand services ($F= 7.30$, $p < 0.05$) and in-room wireless high speed Internet access ($F= 4.55$, $p < 0.05$) among Gen Y, Gen X, and Gen Y, these technologies were rated significantly lower by the silent generation.

On the other hand, the findings indicated that the importance scores of in-room video viewing of guest portfolio ($F=0.57$, $p > 0.05$), in-room temperature control ($F=$

2.39, $p > 0.05$, in-room computers ($F = 1.32$, $p > 0.05$), in-room printers ($F = 0.90$, $p > 0.05$), and voice mail ($F = 1.53$, $p > 0.05$) were not significantly different across generations.

Table 5

Two- way ANOVA Table for Generation and the Purpose of Travel versus Importance Scores of Technologies

<i>In-Room Technologies</i>		<i>df</i>	<i>Seq SS</i>	<i>Adj SS</i>	<i>Adj MS</i>	<i>F</i>	<i>Sig.</i>
in-room check out system through TV	Generation	3	27.206	27.206	9.069	2.74	0.043
	Purpose of Travel	3	6.689	9.985	3.328	1.00	0.391
	Within Groups	426	1411.278	1411.278	3.313		
	Total	432	1445.173				
in-room video viewing of guest portfolio	Generation	3	5.257	5.257	1.752	0.57	0.632
	Purpose of Travel	3	0.684	0.433	0.144	0.05	0.986
	Within Groups	426	1299.444	1299.444	3.050		
	Total	432	1305.386				
in-room movie on demand services	Generation	3	62.966	62.966	20.989	7.30	0.000
	Purpose of Travel	3	5.762	3.595	1.198	0.42	0.741
	Within Groups	426	1224.085	1224.085	2.873		
	Total	432	1292.813				
in room video gaming on demand services	Generation	3	104.929	104.929	34.976	12.74	0.000
	Purpose of Travel	3	1.390	0.527	0.176	0.06	0.979
	Within Groups	426	1169.976	1169.976	2.746		
	Total	432	1276.296				
in-room wireless high speed Internet access	Generation	3	38.639	38.639	12.880	4.55	0.004
	Purpose of Travel	3	11.733	7.232	2.411	0.85	0.466
	Within Groups	426	1206.399	1206.399	2.832		
	Total	432	1256.771				

high definition television content	Generation	3	28.946	28.946	9.649	3.99	0.008
	Purpose of Travel	3	4.055	3.951	1.317	0.54	0.652
	Within Groups	426	1029.817	1029.817	2.417		
	Total	432	1062.818				
3D Television	Generation	3	31.321	31.321	10.440	4.46	0.004
	Purpose of Travel	3	15.144	9.979	3.326	1.42	0.236
	Within Groups	426	996.127	996.127	2.338		
	Total	432	1042.591				
ability to use increased bandwidth	Generation	3	60.245	60.245	20.082	7.08	0.000
	Purpose of Travel	3	15.746	8.333	2.778	0.98	0.402
	Within Groups	426	1208.156	1208.156	2.836		
	Total	432	1284.148				
Internet on TV	Generation	3	70.609	70.609	23.536	8.42	0.000
	Purpose of Travel	3	8.222	4.232	1.411	0.50	0.679
	Within Groups	426	1190.730	1190.730	2.795		
	Total	432	1269.561				
guest room lock access via guest's mobile phone	Generation	3	67.899	67.899	22.633	7.53	0.000
	Purpose of Travel	3	12.752	7.540	2.513	0.84	0.475
	Within Groups	426	1281.128	1281.128	3.007		
	Total	432	1361.778				
in-room temperature control	Generation	3	7.890	7.890	2.660	2.39	0.069
	Purpose of Travel	3	3.272	4.300	1.433	1.29	0.279
	Within Groups	426	474.910	474.910	1.115		
	Total	432	486.162				
new technology phones with visual displays	Generation	3	68.045	68.045	22.682	9.13	0.000
	Purpose of Travel	3	16.789	9.114	3.038	1.22	0.301
	Within Groups	426	1058.662	1058.662	2.485		
	Total	432	1143.497				

in-room electronic safes	Generation	3	47.650	47.650	15.883	4.77	0.003
	Purpose of Travel	3	17.767	18.201	6.067	1.82	0.142
	Within Groups	426	1418.103	1418.103	3.329		
	Total	432	1483.520				
in-room computers	Generation	3	13.536	13.536	4.512	1.32	0.267
	Purpose of Travel	3	26.168	24.346	8.115	2.37	0.070
	Within Groups	426	1456.592	1456.592	3.419		
	Total	432	1496.296				
in-room printer	Generation	3	8.663	8.663	2.888	0.90	0.440
	Purpose of Travel	3	37.373	34.401	11.467	3.59	0.014
	Within Groups	426	1362.186	1362.186	3.198		
	Total	432	1408.222				
voice mail	Generation	3	15.202	15.202	5.067	1.53	0.205
	Purpose of Travel	3	24.245	19.616	6.539	1.98	0.116
	Within Groups	426	1406.798	1406.798	3.302		
	Total	432	1446.245				
connectivity panels	Generation	3	230.769	230.769	76.923	21.63	0.000
	Purpose of Travel	3	13.264	3.195	1.065	0.30	0.826
	Within Groups	426	1515.089	1515.089	3.557		
	Total	432	1759.122				
all-in-one guestroom control units	Generation	3	33.300	33.300	11.100	4.22	0.006
	Purpose of Travel	3	11.047	10.133	3.378	1.28	0.279
	Within Groups	426	1120.766	1120.766	2.631		
	Total	432	1165.113				

Note. df= degree of freedom; Seq SS= sequential of sum of squares; Adj SS= adjusted sum of squares; Adj MS= adjusted mean square

The results of two-way ANOVA for the relationship between purpose of travel and technology importance showed that only one technology in-room printer ($F=3.59$, $p<$

0.05) was more important for dual purpose travelers than for leisure and business travelers. On the other hand, no significant differences were found between the leisure and business travelers' importance rating of the technologies. This finding is consistent with the study conducted by Center for Marketing Effectiveness (2005) which argues that the technologies which have been appealing to business travelers before also now attract leisure travelers.

Are there differences in guests' GET needs and expectations across travel frequency?

To examine whether travel frequency has an effect on respondents' perception of the importance of 18 technologies, one- way ANOVA and Tukey's post-hoc tests (see Table 7) were conducted between travel frequency and the importance score of each technology. The results show that generally there are significant differences between those guests who stayed in a hotel 2 times or less per year and guests who stayed in a hotel more than 2 times per year. Additionally, descriptive statistics showed that almost 43% of the respondents stayed in a hotel 2 times or less, while 57 % stayed in a hotel more than 2 times per year. Based on these findings, to have more meaningful results, two groups were formed. The "low" group included the respondents who had stayed in a hotel 2 times or less per year; while the "high" group was composed of respondents who had stayed in a hotel more than 2 times per year.

The comparisons of the means for the importance scores of technologies indicated that the high group rated the importance of all technologies higher than the low group.

Table 6

One-Way ANOVA Table for Travel Frequency versus Importance Scores of Technologies

<i>In-Room Technologies</i>		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
in-room check out system through TV	Between Groups	1	17.73	17.73	5.11	0.024
	Within Groups	504	1749.28	3.47		
	Total	505	1767.01			
in-room video viewing of guest portfolio	Between Groups	1	43.31	43.31	14.41	0.000
	Within Groups	501	1506.37	3.01		
	Total	502	1549.69			
in-room movie on demand services	Between Groups	1	4.62	4.62	1.53	0.216
	Within Groups	501	1512.22	3.02		
	Total	502	1516.84			
in room video gaming on demand services	Between Groups	1	4.65	4.65	1.59	0.208
	Within Groups	499	1458.66	2.92		
	Total	500	1463.32			
in-room wireless high speed Internet access	Between Groups	1	78.77	78.77	28.59	0.00
	Within Groups	493	1358.07	2.75		
	Total	494	1436.84			
high definition television content	Between Groups	1	43.97	43.97	18.28	0.000
	Within Groups	498	1197.48	2.40		
	Total	499	1241.45			
3D Television	Between Groups	1	16.90	16.90	6.72	0.010
	Within Groups	501	1259.65	2.51		
	Total	502	1276.54			
ability to use increased bandwidth	Between Groups	1	24.98	24.98	8.45	0.004
	Within Groups	502	1483.18	2.95		
	Total	503	1508.16			
Internet on TV	Between Groups	1	7.91	7.91	2.67	0.103
	Within Groups	500	1484.35	2.97		
	Total	501	1492.26			

guest room lock access via guest's mobile phone	Between Groups	1	17.03	17.03	5.40	0.021
	Within Groups	500	1576.94	3.15		
	Total	501	1593.97			
in-room temperature control	Between Groups	1	0.81	0.81	0.73	0.392
	Within Groups	474	524.83	1.11		
	Total	475	525.64			
new technology phones with visual displays	Between Groups	1	12.39	12.39	4.54	0.034
	Within Groups	501	1366.90	2.73		
	Total	502	1379.30			
in-room electronic safes	Between Groups	1	16.75	16.75	4.79	0.029
	Within Groups	496	1734.85	3.50		
	Total	497	1751.60			
in-room computers	Between Groups	1	5.38	5.38	1.53	0.216
	Within Groups	502	1759.73	3.51		
	Total	503	1765.11			
in-room printer	Between Groups	1	19.72	19.72	5.93	0.015
	Within Groups	501	1666.42	3.33		
	Total	502	1686.14			
voice mail	Between Groups	1	2.40	2.40	0.71	0.401
	Within Groups	493	1680.73	3.41		
	Total	494	1683.13			
connectivity panels	Between Groups	1	27.78	27.78	6.96	0.009
	Within Groups	491	1959.39	3.99		
	Total	492	1987.18			
all-in-one guestroom control units	Between Groups	1	11.35	11.35	4.27	0.039
	Within Groups	500	1327.98	2.66		
	Total	501	1339.32			

Note. df= degree of freedom; SS= sum of Squares; MS= mean square

The results of the tests show that in-room check out system through TV ($F=5.11$, $P < 0.05$), in-room video viewing of guest portfolio ($F=14.41$, $p < 0.05$), in-room wireless

high speed Internet access ($F=28.59$, $p < 0.05$), high definition television content ($F=18.28$, $P < 0.05$), 3D Television ($F= 6.72$, $p < 0.05$), ability to use increased bandwidth ($F= 8.45$, $p < 0.05$), guest room lock access via guest's mobile phone ($F=5.40$, $p < 0.05$), new technology phones with visual displays ($F= 4.54$, $p < 0.05$), in-room electronic safes ($F=4.76$, $p < 0.05$), in-room printer ($F=5.93$, $p < 0.05$), connectivity panels ($F= 6.96$, $p < 0.05$), and all-in-one guestroom control units ($F= 4.27$, $P < 0.05$) are the technologies that are significantly more important for the high group than for the low group. Six technologies, in-room movie on demand services ($F=1.53$, $p > 0.05$), in room video gaming on demand services ($F=1.59$, $p > 0.05$), Internet on TV ($F= 2.67$, $p > 0.05$), in-room temperature control ($F= 0.73$, $p > 0.05$), in-room computers ($F= 1.53$, $P > 0.05$), and voice mail ($F= 0.71$, $p > 0.05$) did not show any significant differences between groups.

To analyze whether travel frequency impacts the respondents' perception of in-room technologies in terms of performance, 18 ANOVA and Turkey's post-hoc tests (see table 8) were conducted between travel frequency groups -low and high- and the performance score of each technology. Even though the high group rated the performance of almost all technologies higher than the low group, only the performance scores of four technologies, in-room check out system through TV ($F=10.02$, $p < 0.05$), in-room video viewing of guest portfolio ($F= 9.34$, $p < 0.05$), in room video gaming on demand services ($F= 4.78$, $p < 0.05$), and in-room electronic safes ($F= 4.35$, $p < 0.05$) showed significant differences between groups.

Table 7

One-Way ANOVA Table for Travel Frequency versus Performance Score of Technologies

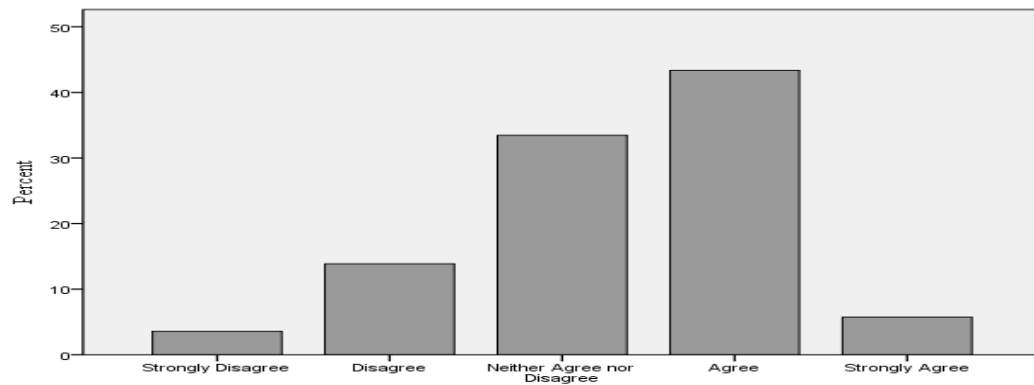
In-Room Technologies		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig</i>
in-room check out system through TV	Between Groups	1	18.25	18.25	10.02	0.002
	Within Groups	210	382.52	1.82		
	Total	211	400.77			
in-room video viewing of guest portfolio	Between Groups	1	16.48	16.48	9.34	0.003
	Within Groups	201	354.54	1.76		
	Total	202	371.02			
in-room movie on demand services	Between Groups	1	5.11	5.11	3.60	0.059
	Within Groups	338	479.42	1.42		
	Total	339	484.53			
in room video gaming on demand services	Between Groups	1	7.17	7.17	4.78	0.030
	Within Groups	215	322.67	1.50		
	Total	216	329.83			
in-room wireless high speed Internet access	Between Groups	1	5.40	5.40	3.07	0.081
	Within Groups	394	693.40	1.76		
	Total	395	698.80			
high definition television content	Between Groups	1	5.74	5.74	3.20	0.075
	Within Groups	361	647.89	1.79		
	Total	362	653.63			
3D Television	Between Groups	1	2.26	2.26	0.92	0.338
	Within Groups	129	315.25	2.44		
	Total	130	317.51			
ability to use increased bandwidth	Between Groups	1	1.83	1.83	0.86	0.355
	Within Groups	167	353.64	2.12		
	Total	168	355.47			

Internet on TV	Between Groups	1	1.66	1.66	0.68	0.410
	Within Groups	157	381.26	2.43		
	Total	158	382.92			
guest room lock access via guest's mobile phone	Between Groups	1	5.50	5.50	2.21	0.139
	Within Groups	134	333.56	2.49		
	Total	135	339.06			
in-room temperature control	Between Groups	1	2.54	2.54	1.68	0.195
	Within Groups	469	707.49	1.51		
	Total	470	710.03			
new technology phones with visual displays	Between Groups	1	8.12	8.12	3.27	0.073
	Within Groups	163	405.12	2.49		
	Total	164	413.24			
in-room electronic safes	Between Groups	1	11.21	11.21	4.35	0.038
	Within Groups	269	692.76	2.58		
	Total	270	703.97			
in-room computers	Between Groups	1	0.91	0.91	0.27	0.602
	Within Groups	134	444.44	3.32		
	Total	135	445.35			
in-room printer	Between Groups	1	0.24	0.24	0.08	0.777
	Within Groups	126	374.63	2.97		
	Total	127	374.87			
voice mail	Between Groups	1	3.98	3.98	1.49	0.224
	Within Groups	240	641.05	2.67		
	Total	241	645.03			
connectivity panels	Between Groups	1	2.25	2.25	0.90	0.343
	Within Groups	232	578.49	2.49		
	Total	233	580.74			
all-in-one guestroom control units	Between Groups	1	3.08	3.08	1.51	0.221
	Within Groups	197	402.74	2.04		
	Total	198	405.82			

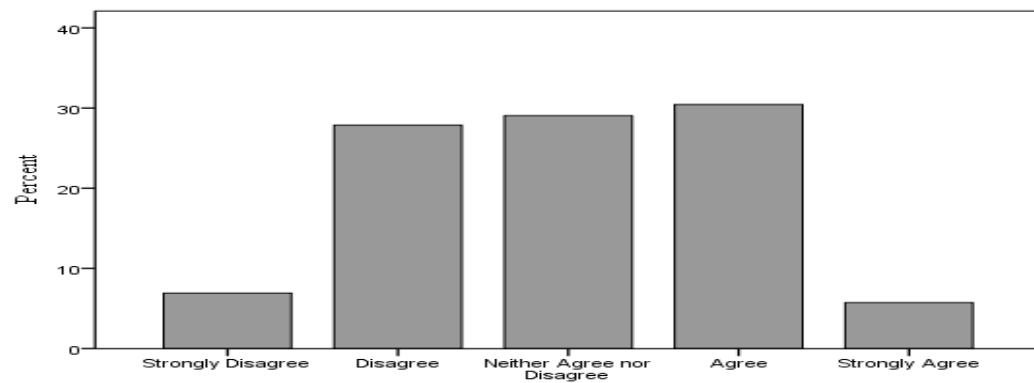
Note. df= degree of freedom; SS= sum of Squares; MS= mean square

Does the availability of new guest room technologies impact guests' decision in choosing a hotel? Are guests willing to pay extra for a guest room which has current in-room technologies?

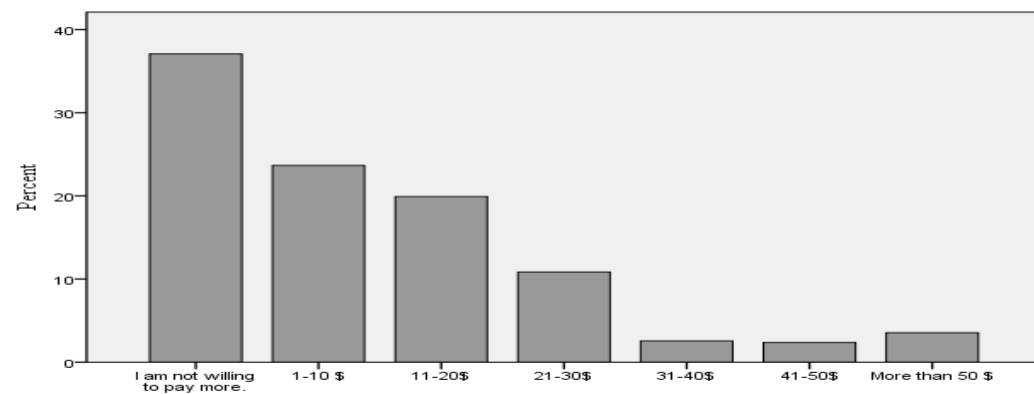
Almost half of all respondents agreed that the availability of new guest room technologies impacted their decision in choosing a hotel. (See Figure 3) Only 17.5 % of the respondents thought that the availability of new guest technologies would not make any change in their decision when choosing a hotel. Fully 36,1 % of the respondents reported that they were willing to pay extra for a guest room which has state of the art in-room technologies, while 34,8 % were not. Almost 24 % of the respondents indicated that they would pay \$1 to \$10 more to stay in such a room; 19.9 % were willing to pay \$ 11 to \$ 20; and 10.8 % reported that they would pay \$21 to \$30 more.



The availability of new guest room technologies impacts my decision in choosing a hotel.



I am willing to pay extra for a guest room which has state of the art in-room technologies.



How much more are you willing to pay to stay in a guest room which has state of the art in-room technologies?

Figure 3. Response rates

How would guests prefer to pay for the wireless internet service in a hotel (included in room rate or priced separately)?

Almost 76 % of the respondents want their internet charge included in their room rates in hotels. If the hotel prices the internet separately, a majority (67.9 %) would prefer to pay a single fee for a fixed speed, while 30.9 % prefer to pay a la carte by picking the preferred speed and pay accordingly. Almost 40 % reported that they would like to pay a fixed rate per day for time-based usage of Internet access; 30.1 % would like to pay as they go and 29.5 % prefer a fixed rate based on duration of stay.

Does an interactive TV in the hotel room enhance the guest experience?

50.6 % of respondents think that having an interactive TV in the hotel room enhances their experience as a hotel guest. While the time range that the respondents spend watching TV per day in a hotel room is between 0 to 12 hours, the average time is 2.78 hours per day, consistent with the findings of Ostrowski's study (2006). The average number of hours respondents spent in a hotel room per day was 8.82.

Hypothesis

H1: There are differences in guests' GET preferences and expectations across generation as well as the purpose of travel.

H0: There are no differences in guests' GET needs preferences and expectations across generation as well as the purpose of travel.

H1 is accepted. The importance of many technologies was rated significantly different by different generations as well as the purpose of travel.

Chapter 5

Conclusion and Implications

The present study defined in-room technologies perceived by the guests as mission critical for the hotel room. In addition, it indicated how hotel guests evaluate the importance of 18 in-room technologies as well as whether they are satisfied with their performance. It also showed the relationships among technology preference and generations, the purpose of travel, and travel frequency. Overall sample of this study show similarities with US population in terms of some demographic characteristics (female and male proportion, age distribution, marital status, and education level) and the travel behavior. Therefore, some findings of the present study can be generalizable to US hotel guests.

Key Findings

In-room movie on demand services, in-room wireless high speed internet service, high definition television content, in-room temperature control, in-room electronic safe, connectivity panels, and all in one guest room control units are perceived by hotel guests as mission critical technologies. These technologies are more important for the hotel guests than others. The guests are also satisfied with the performance of these technologies. Therefore, they would like to use these technologies during their hotel stay. Hoteliers should offer these technologies in their guest rooms to enhance their guests' hotel stay experiences and increase guest satisfaction.

Some of the technologies that guests think are not very important are relatively new technologies, such as 3D television, Internet on TV, and guest room lock access via guest's mobile phone. Since these technologies are not very common either in homes or

at hotels, the guests may not see them as a must for a hotel room now. However, after these technologies start to become more common, the guest demand for these technologies may increase and the guests may start to see these technologies as a must for the guest rooms.

The participants of this study thought that three of the examined technologies, in-room check out system through TV, in room video viewing of guest profile, and voice mail, perform well but are less important. The hoteliers may consider allocating the budget of these technologies to other technologies perceived to be more important by guests.

This study also showed that among five entertainment technologies which were examined in this study -in-room movie on demand services, in room video gaming on demand services, 3D television, Internet on TV, and connectivity panel- in- room movies on demand services and connectivity panel are the most important entertainment technologies for guests. Hotels should give the priority to these two technologies when investing in the guest room entertainment technologies.

Like previous studies (Center for Marketing Effectiveness, 2005; Lussan, 2009), this study found that the different generations mostly assigned a different importance level to the same technologies (see Figure 4)

As shown in Figure 4, Gen Y placed significantly more importance to many technology items when compared with generations. This finding supports the previous studies arguing that Gen Y is the most technology savvy generation (Forrester Research, 2008; Center for Marketing Effectiveness, 2005). It shows that the hotels cannot attract Gen Y only with the technologies that may appeal to Gen X and Baby Boomers. Gen Y

demand more technologies in hotel guest rooms than any other generations. Therefore, in order to attract Gen Y, hotels should consider this demand when investing in their in-room technologies.

Gen Y (born between 1977 and 1993)	in- room video gaming on demand, guest room lock access via guest's mobile phone, and new technology phones with visual displays	> all other generations
Gen Y	3D television, ability to use increased bandwidth, internet on TV	> baby boomers (born between 1946 and 1964) and silent generation
Gen Y	in room electronic safes, all in one control units	> silent generation
Gen X (born between 1965 and 1976)	In room video gaming on demand services, 3D Television, and ability to use increased bandwidth and internet on TV	> silent generation
silent generation (born after 1945)	in-room movie on demand services, and in-room wireless high speed Internet access	< all other generations
Gen X, Gen Y, Baby boomers, Silent generation	connectivity panels	younger generations gave significantly more importance

Figure 4. The technology preference differences across generations. “>” indicates that the generation in the first column assigned significantly high importance to the technologies in the second column than generations in the third column; “<” indicates that the generation in the first column assigned significantly low importance the technologies in the second column than generations in the third column.

On the other hand, except for connectivity panel, the importance score of none of the technologies showed a significant difference between Gen X and Baby boomers. This finding is consistent with AARP and Microsoft’s study (2009) indicating that baby boomers were open to new technologies. Baby boomers and Gen X both perceived the same set of technology items to be important. However, they were still far behind Gen Y in terms of the number of technologies deemed as important. Hotels which would like to

appeal to several different generations of travelers have to consider these technology preference differences when purchasing, implementing and upgrading guest room technologies.

There are also some technologies that are perceived to be important not only by Gen Y, but also by Gen X and Baby Boomers. These technologies include in-room movie on demand services, in-room wireless high speed Internet access, and electronic in-room temperature control unit. Therefore, these technologies are a “must have” for hotels.

This study also shows that today’s leisure travelers assign as much importance to in room technologies as business travelers. Today even the hotels targeting only leisure travelers have to invest in the guest room technologies. They should provide in-room technologies to their leisure guests which have in the past appealed only to business travelers.

Moreover, the findings indicated that guests who stayed in a hotel more than two times per year ascribed significantly more importance to many technologies. Since these guests travel more often, it is understandable that they may need more technologies in their room and therefore view these technologies more important. Specifically those hotels which serve primarily frequent travelers should make an investment in their guest room technologies.

In this study, after the in-room temperature control unit, the importance of in-room wireless internet was rated the highest by respondents. This finding is consistent with an earlier research study conducted by J.D Power and Associates (Greif, 2010). According to J.D Power and Associates’ study, among all amenities, wireless internet access is the most important amenity for almost all segments of hotel guests. Therefore,

offering complimentary wireless internet service would enhance guest satisfactions.

Today, primarily economy and midscale hotels offer complimentary wireless internet services to their guests (Greif, 2010). Not surprisingly, 84.25% of the participants of this study, who had reported their desire for having the Internet fee to be included in their room rate, stayed in an economy or a midscale hotel during their last hotel stay..

If a hotel charges for Internet access separately, a majority of participants would prefer to pay a single fee for fixed speed, or pay a fixed rate per day for time-based usage of Internet access. This result shows that if Internet service is not complimentary in a hotel, guests would like to know the total amount they would pay for Internet service before using it.

Another finding of the study was that the availability of new guest technologies impacts guests' decisions when choosing a hotel. The majority of the respondents also indicated that they would like to pay more to stay in such a guest room. Moreover, the participants of this study thought that having an interactive TV enhances their experience as a hotel guest. Therefore, hotels which have state of the art in-room technologies should place them in their marketing plan and mention them in advertisements, websites and brochures to attract more guests. They may especially attract Gen Y who is the most technology savvy generation. As previously stated, different technologies are important for different guest profiles. Therefore, in their marketing campaigns, hotels should emphasize the technologies that are in popular demand by their guests.. In conclusion, the findings of this study should provide guidance for hoteliers in purchasing, upgrading or implementing in-room technologies with which to appeal to their guests.

Limitations

One of the limitations of the study is its method of data collection. The survey was distributed online, so the research excluded the people who do not have internet access or computer skills, such as people belonging to the silent generation, who were also a target of this study. If the same research had been done with a paper survey, it may have arrived at different results. However, considering that 77.4 % of the US population uses the Internet (Internet World Stats, 2010), this may not be a strong limiting factor. Yet, this study still excludes the people who prefer not to share information online.

Social desirability bias is another limitation of the study. Despite the anonymity of the survey, some respondents may indicate that they have used the in room GETs which they have not used, to gain prestige or appear in a different social role. Additionally, since the survey was self-administered, there was no way to clarify any uncertainty that the respondents might have regarding the questions. Moreover, the survey asked respondents to remember past events. Therefore, respondents' failure to accurately recall past experiences was a potential issue.

The other limitation is that different hotels use different companies to supply their in-room technology. Even though these devices have some similarities, they may have significant operational differences. Therefore, one guest room technology of a specific kind in one hotel may perform better than the same technology produced by another company in another hotel. For example, one telephone with visual display might perform significantly better than the same kind of telephone produced by a different company, leading to variation in the performance ratings within a category of in-room technology.

The majority of respondents were leisure travelers. A study in which the majority of respondents are business travelers may give different results. Future research may

utilize quota sampling and recruit 50 % of respondents from leisure travelers and 50 % from business travelers, and may analyze the technology preferences differences in greater depth.

Moreover, the majority of respondents of this study have stayed most recently in a midscale or an upper midscale hotel. Given that IT budgets of upscale and luxury hotels are higher than that of midscale and economy hotels, they might offer more in-room technologies for their guests. Therefore, further research should examine guests of upscale and luxury hotels as a sample for better understanding of their in-room technology preferences.

Future studies may also include relatively newer technologies which were excluded in this study such as the iPad and Xbox.

Appendix 1

Survey

Q1 Did you stay in a hotel at least once in the past 12 months?

- ☐ Yes
- ☐ No

Q2 How frequently do you stay in a hotel?

- ☐ Less than once a year
- ☐ Once a year
- ☐ Twice a year
- ☐ Three times a year
- ☐ Four times a year
- ☐ Five times a year
- ☐ More than five times a year _____

Q3 During your last hotel stay, how many nights did you stay in the hotel?

Q4 Last time when you stayed in a hotel, what kind of hotel did you stay in?

- ☐ Luxury (ex. The Ritz Carlton, Four Seasons)
- ☐ Upscale (ex. Grand Hyatt, Sofitel)
- ☐ Upper Midscale (ex. Hyatt, Hilton)
- ☐ Midscale (ex. Courtyard)
- ☐ Economy (ex: Motel 6)
- ☐ Other _____

Q5 What was the main purpose of your trip when you last stayed in a hotel?

- ☐ Leisure
- ☐ Business
- ☐ Business and Leisure
- ☐ Other _____

Q6 Approximately, how many hours per day do you spend in a hotel room? (Please enter the average number of hours you spend)

Q7 What is your gender?

- ☐ Male
- ☐ Female

Q8 What is your age?

- ☐ 18-28
- ☐ 29-34
- ☐ 35-46
- ☐ 47-57
- ☐ 58-65
- ☐ 66-75
- ☐ Above 75

Q9 Are you currently?

- ☐ Married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Single
- ☐ Other _____

Q10 Are you currently?

- ☐ Full Time Employed
- ☐ Part Time Employed
- ☐ Unemployed
- ☐ Retired
- ☐ Other _____

Q11 How much is your annual household income?

- ☐ Less than \$ 36,000
- ☐ \$ 36,000- \$ 48,000
- ☐ \$ 48,001- \$ 60,000
- ☐ \$ 60,001- \$ 72,000
- ☐ \$ 72,001- \$ 84,000
- ☐ \$ 84,001- \$ 96,000
- ☐ \$ 96,001- \$ 108,000
- ☐ More than \$ 108,000

Q12 What is the highest educational degree you received?

- ☐ Less than High School Diploma
- ☐ High School Diploma
- ☐ Some College
- ☐ Trade/Technical School
- ☐ Bachelor of Sciences/Arts
- ☐ Master Degree
- ☐ JD
- ☐ PhD
- ☐ Other _____

Q13 The availability of new guest room technologies impacts my decision in choosing a hotel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q14 I am willing to pay extra for a guest room which has state of the art in-room technologies.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q15 How much more are you willing to pay to stay in a guest room which has state of the art in-room technologies?

- ☐ I am not willing to pay more.
- ☐ 1-10 \$
- ☐ 11-20\$
- ☐ 21-30\$
- ☐ 31-40\$
- ☐ 41-50\$
- ☐ More than 50 \$

Q16 Would you prefer high speed Internet to be included in your hotel room rate or priced separately?

- ☐ Included in the room rate
- ☐ Priced separately

Q17 If priced separately, how would you prefer to pay for speed of Internet access?

- ☐ Single fee for fixed speed
- ☐ A la carte (pick the preferred speed and pay accordingly)

Q18 If priced separately, how would you prefer to pay for time based usage of Internet access?

- ☐ Pay As You Go
- ☐ Fixed Rate Per Day
- ☐ Fixed Rate Based On Duration Of Stay

Q19 Please rate the importance of the following eighteen in-room technologies for you. Selecting “Extremely Important (7)” means that the particular technology is a must have during your hotel stay. Selecting "Not At All Important (1)" means that the particular technology is not useful or needed at all during your hotel stay.

In-Room Technologies	Not At All Important (1)	Unimportant (2)	Not So Important (3)	Neither Important nor Unimportant (4)	Important (5)	Very Important (6)	Extremely Important (7)	Not Applicable
in-room check out system through TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room video viewing of guest portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room movie on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in room video gaming on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room wireless high speed Internet access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
high definition television content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3D Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to use increased bandwidth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet on TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
guest room lock access via guest's mobile phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room temperature control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
new technology phones with visual displays	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room electronic safes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room printer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
voice mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
connectivity panels (plugging your games, laptop, etc. into an HD TV)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
all-in-one guestroom control units	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20 Please rate the performance of each technology during your last hotel stay.

In-Room Technologies	Terrible (1)	Very Bad (2)	Bad (3)	Neither Good nor Bad (4)	Good (5)	Very Good (6)	Excellent (7)	Not Applicable
in-room check out system through TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room video viewing of guest portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room movie on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in room video gaming on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room wireless high speed Internet access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
high definition television content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3D Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to have increased bandwidth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet on TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
guest room lock access via guest's mobile phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room temperature control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
new technology phones with visual displays	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room electronic safes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room printer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
voice mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
connectivity panels (plugging your games, laptop, etc. into an HD TV)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
all-in-one guestroom control units	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 Please rate how frequently you use the following technologies during your stay in a hotel.

	Never (1)	Very Rarely (2)	Occasionally (3)	Frequently (4)	Very Frequently (5)	Not Available
in-room check out system through TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room video viewing of guest portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room movie on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in room video gaming on demand services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room wireless high speed Internet access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
high definition television content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3D Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
access to increased bandwidth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet on TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
guest room lock access via guest's mobile phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room temperature control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
new technology phones with visual displays	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room electronic safes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in-room printer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
voice mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
connectivity panels (plugging your games, laptop, etc. into an HD TV)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
all-in-one guestroom control units	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q22 How many hours per day do you spend watching TV while in the hotel room?

Q23 Do you think having an interactive TV in the hotel room enhances your experience as a hotel guest?

- ☐ Yes
- ☐ No

APPENDIX 2

IRB APPROVAL



Social/Behavioral IRB – Exempt Review

Deemed Exempt

DATE: October 4, 2011
TO: **Dr. Mehmet Erdem**, Hotel Management
FROM: Office of Research Integrity – Human Subjects
RE: Notification of review by/ **Cindy Lee- Tataseo/Ms. Cindy Lee- Tataseo, BS,CIP,CIM**
Protocol Title: **What is Mission Critical in the Hotel Guest Room? Examining In- Room Guest Empowerment Technologies.**
Protocol #**1109-3926M**

This memorandum is notification that the project referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46 and deemed exempt under 45 CFR 46.101(b)2.

PLEASE NOTE:

Upon Approval, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI – HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials. The official versions of these forms are indicated by footer which contains the date exempted.

The language in the approval documents has been changed. The spelling of “principle” was changed to correct spelling of “principal”. *Any* changes to the application may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**. When the above-referenced project has been completed, please submit a **Continuing Review/Progress Completion report** to notify ORI – HS of its closure. If you have questions or require any assistance, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 895-2794.



Social/Behavioral IRB – Exempt Review

Modification Approved

NOTICE TO ALL RESEARCHERS:

Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation, suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Officer.

DATE: October 12, 2011

TO: Dr. Mehmet Erdem, Hotel Management

FROM: Office of Research Integrity - Human Subjects

RE: Notification of review by / **Lori Olafson/ Dr. Lori Olafson, Co- Chair**

Protocol Title: **What is Mission Critical in the Hotel Guest Room?**

Examining In- Room Guest Empowerment Technologies.

Protocol #: **1109-3926M**

The modification of the protocol named above has been reviewed and deemed exempt.

Modifications reviewed for this action include:

- Questions 2,3,10,11,17,19,20, and 21 modified in order to clarify meaning.
- Addition of new questions to the survey.

This IRB action does not change your exempt status.

Should there be *any* change to the protocol, it will be necessary to submit a **Modification Form** through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been reviewed and a determination has been made by the ORI-HS and/or the IRB. Modified versions of protocol materials must be used upon final determination. Unanticipated problems, deviations to protocols, and adverse events must be reported to the ORI – HS within 10 days of occurrence. If you have questions or require any assistance, please contact the Office of Research Integrity – Human Subjects at IRB@unlv.edu or call 895-2794.

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VITA
Graduate College
University of Nevada, Las Vegas

Pelin Nasoz

Contact information:

Email: nasozp@unlv.nevada.edu
pelinnasoz@yahoo.com

Education:

B.A. in Tourism Administration, June 2007, Bogazici University, Istanbul, Turkey

Thesis: Emotional Labor in Tourism Industry and Its Multilevel Consequences

Experience:

Graduate Assistant: January 2010- December 2011, University of Nevada, Las Vegas

International Refereed Conference Publications:

D. Salman Öztürk, C. Karayel and P. Nasoz (2008) Employees on Service Stage: Emotional Labor in Tourism Industry and Its Multilevel Consequences. In Proceedings of *2nd International Colloquium on Tourism and Leisure*, May 2008, Chiang Mai, Thailand.

Awards:

Best Paper Award at 2nd International Colloquium on Tourism and Leisure, May 2008, Chiang Mai, Thailand.