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# The Utilization of a hybrid task technologyfit-technology acceptance model for the evaluation of hotel Guest Empowerment Technologies usage

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THE UTILIZATION OF A HYBRID TASK TECHNOLOGY FIT-TECHNOLOGY  
ACCEPTANCE MODEL FOR THE EVALUATION OF HOTEL GUEST  
EMPOWERMENT TECHNOLOGIES USAGE

by

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Bachelor of Science  
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1999

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of the requirements for the

**Doctor of Philosophy Degree in Hospitality Administration**  
**William F. Harrah College of Hotel Administration**

**Graduate College**  
**University of Nevada, Las Vegas**  
**August 2009**

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## ABSTRACT

### **The Utilization of a Hybrid Task Technology Fit-Technology Acceptance Model for the Evaluation of Hotel Guest Empowerment Technologies Usage**

by

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In the modern economy organizations are trying to find every means possible to increase productivity and reduce costs. As such many organizations have turned to technology to aid in this. Due to this in recent years there has been a transition from traditional consumer self-service environments to technology assisted self-service environments. Through the use of technology customers are able to create products and services for purchase by with little to no help from the organization providing the products and services.

The hotel industry has also seen a rise in the use of technology applications to guests in performing services once only conducted by employees. A specialized form of this type of usage of self-service technology in the hotel industry is known as Guest Empowerment Technology (GET). Specifically, Guest Empowerment Technologies are electronic systems that allow hotel guests to have more personal control over their stay in a hotel as well as systems that provide more convenience for guests without direct



intervention from hotel staff. These technologies include systems such as in-room check-out systems, in-room entertainment systems, on demand printing services, lobby kiosks, and online reservation systems. The purpose of this study was to determine and quantify the factors that impact hotel guests' intentions to seek and utilize guest empowerment technologies.

This study found that the factors of individual characteristics, technology characteristics, task characteristics, fit, perceived ease of use, and perceived usefulness have a significant impact on intention to use. The contribution of this research is both academic and practical. First, this study will be among the first to examine and test determinants of guests' intentions to utilize guest empowerment technologies. In addition, this study will expand upon the current body of knowledge in the areas of self-service technology acceptance, perceived ease of use of self-service technology, perceived usefulness of self-service technology, and improve the understanding of the relationships among perceived ease of use, perceived usefulness, intentions to use, task characteristics, technology characteristics, individual characteristics, and fit. The third contribution this study will make is through the development and extension of a multidimensional instrument to measure perceived ease of use, perceived usefulness, intentions to use, task characteristics, technology characteristics, individual characteristics, and fit.

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“All our dreams can come true, if we have the courage to pursue them.”

– Walt Disney

## CHAPTER 1

### INTRODUCTION

The purpose of this research is to examine the factors that affect the usage of a specific type of Self-Service Technology (SST) utilized in the hotel industry, referred to as Guest Empowerment Technology (GET). This will be done by examining the constructs of a Hybrid Task-Technology Fit (TTF)/Technology Acceptance Model (TAM) as related to Guest Empowerment Technologies. This chapter first discusses the foundations of modern self-service and provides a background on SST and GETs and the factors contributing to their usage. Secondly, an outline of the research purpose and hypotheses will be presented. Finally, the potential contributions of this study to the hotel industry as well as hospitality information technology will be proposed.

#### Background of Self-Service

The roots of the modern concept of self-service in terms of a customer performing a majority of the effort required in obtaining a product can be traced back to the development of the self-service grocery store concept in the early 1900s. Prior to this most retail stores utilized a counter service method in which customers requested items from the shopkeeper. The shopkeeper would then find the items on the store shelves or storage area and bring the products to the customer who then paid for them (Kotler, 2003). This all changed in 1917 when entrepreneur Clarence Saunders founded the



Piggly Wiggly grocery store chain and filed for a patent on the “self-service supermarket”. Saunders’ goal was to increase efficiency in delivering products to the customers by eliminating the clerks who had to find items on the shelves. In this way customers were able to complete their shopping experiences more quickly. In addition, a single clerk was able to interact with a greater number of customers during a day because his job functions had shifted to mainly being responsible for payment transactions as well as inventory control (Dulken, 2000). By the 1930s the concept of the self-service supermarket was established as a successful business model and was being applied to other retail sectors. By adopting this model, business owners found that they could reduce their costs through reduced labor. These savings were often passed on to the customer through lower priced items (McNair & May, 1978).

### The Utilization of Self-Service Technology (SST)

As profit margins become smaller and smaller, organizations are trying to find every means possible to increase productivity and reduce costs (Green & Skinner, 2005). We are therefore seeing a transition from traditional consumer self-service environments to technology assisted self-service environments (Dabholkar, 1994). In this concept, customers are able to create products and services for purchase by utilizing technology with little to no help from the organization providing the products and services (Henderson, 2001). Some examples of SST most commonly utilized in business are automated teller machines, vending machines, electronic blood pressure checking equipment, automated telephone systems, grocery store self checkout lines, information

kiosks in retail stores, fast food self ordering systems, and boarding pass and baggage check kiosks at airports.

Self-service technologies are commonly defined as devices and/or applications that permit users to produce a service independent of the direct involvement of the service provider (Meuter, Ostrom, Roundtree, & Bitner, 2000). While there are many forms of SSTs utilized in today's modern hotels one of the more common types of self-service technologies utilized in the hotel industry are check-in kiosks (Carlin, 2007). The use of self-service technologies in the hotel industry has grown considerably, especially self check-in, in-room check-out, and foodservice kiosks (Kasavana, 2005). Between 2005 and 2006, managers' belief in the importance of kiosks for business practices increased by 8% (Carlin, 2006). Hotel managers have come to expect benefits from self-service technology in the form of enhanced customer services and operational efficiency (Doyle, 2007).

However, not all self-service technology applications have lived up to their promises. Part of the reason for this is that while many customers have begun to use self-service technologies, a large percentage has chosen not to accept them. The two biggest reasons given by non-adopters for not using self-service devices are that they prefer to receive services directly from a person and that they require specific interactions with an employee to complete their transactions (Dabholkar, Bobbit, & Lee, 2003). As a result of investing heavily in self-service technologies and not seeing the anticipated customer demand, some companies have begun offering special incentives to entice potential self-service users to utilize these technologies (Chang & Yang, 2007). Some companies have even altered the way in which they perform certain operational tasks in order to get

customers to use the available self-service technologies. Such is the case with Delta Airlines. In select airports Delta has installed self-service check-in kiosks for reading passport documents and is requiring international travelers to use the kiosks instead of the traditional ticket counter (Weiss, 2006). Additionally, depending on the scale at which some companies undertake the implementation of self-service technologies, there can be a large risk involved. Some of the risk factors can include such things as reliability, security, and privacy issues (Calisir & Gumussoy, 2008). Therefore it is extremely important that companies make the best use possible of their self-service technologies.

Self-service technologies are widely used for delivering various services. If used properly these technologies are capable of lowering an organization's labor costs, offering customers additional services they may not find elsewhere, and increasing customer satisfaction (Lee & Allaway, 2002). For these reasons it has been seen that the implementation of SST can be used to replace at least a portion of an organization's employees as well as job functions that would otherwise be outsourced to foreign workers. Labor outsourcing has been the result of cost cutting measures in recent decades. However, by doing so, some corporations have seen a decrease in customer satisfaction (Weinstein, 2007). Under these circumstances SST can be a welcomed alternative to outsourcing. If utilized properly it has the possibilities of lowering labor costs and creating increased customer satisfaction.

Current literature on SST has investigated the customer's satisfaction level of SST (Dabholkar, 1996; Jamal, 2004; Yen, 2005) frequency and extent to which customers utilize SST (Curran & Meuter, 2005), and the applications of SST within a variety of types of industries such as retail, banking, and hospitality (Bitner, Brown, & Meuter,

2000; Christiansson & Sporrek, 2004; Meuter, Bitner, Ostrom, & Brown, 2005). The following section will provide a brief examination of SST usage from both the perspective of business applications as well as the consumer's viewpoint

## Contributing Factors for Usage of SST

### *Business Perspective*

#### *Reduced Labor Costs*

As previously mentioned organizations are attempting to find ways to reduce costs (Green & Skinner, 2005). This is not a new issue. For years businesses have been using varying forms of technology in their back-office operations in order to increase their internal efficiency as well as manage their accounts with vendors (Walley & Amin, 1994). These original types of technology applications were generally utilized by managers and upper level employees out of the view of customers. However, as innovations in technology progressed companies found that they could use these technologies to aid in serving customers more efficiently. As technology has developed further to the form of modern self-service technologies, organizations have found ways to utilize these applications and devices in order to place customers into the position of being active participants in the creation of their own experiences with the organization (Grove & Fisk, 1983).

Some organizations have begun to utilize forms of self-service technology to give some or all of the control of product creation directly to the consumer. In doing so, these organizations have been able to eliminate or at least reduce the total number of employees needed within the organization. Additionally, when various forms of SST are

implemented the staff is often able to focus more of their effort on activities directly related to the company's core business, as opposed to customer service activities (Doyle, 2007). It should be noted, however, that if a significant portion of a company's core business operations are directly related to customer service activities, such as companies contracted to provide telephone assistance to customers, then SSTs may not be as beneficial as in other applications.

One example to illustrate this point is that in 2001 the approximate number of grocery store and retail cashiers in the United States was 2.97 million (Brunner, 2002). If self-service kiosks were installed at a ratio of one cashier monitoring four kiosks, once consumers have adjusted to the changes in the check-out procedures, it is estimated that nearly 2 million of those positions could be eliminated. From a business standpoint, doing so could save billions of dollars in labor costs as the customers would be in effect performing the same duties as the employees. However, the potential negative publicity of large job cuts as well as the potential frustrations that would be experienced by customers unused to the new system has prevented many businesses from taking such actions (Brady, 2000).

#### *Increased Revenue*

Businesses have seen benefits from SST not only in the form of reduced labor costs but also in terms of revenue generation. Some of the largest companies in the retail and grocery industries, specifically Wal-Mart, Target, and Kroger, have effectively implemented self-service check out kiosks in their operations. Over the past few years, the volume of consumers utilizing these kiosks along with the companies' per receipt transactions has been steadily increasing. The total number of kiosk transactions for all

of the companies during the first five years of implementation was estimated to increase from 3 million in the first year to 23 million in the fifth year. Additionally, the average transaction amount was expected to increase from \$57 to \$89 (Henderson, 2001).

With organizations increasing their implementation of technologies such as customer kiosks and other SSTs indicates that these organizations are trying to gain an advantage over their competition. However, it may not be possible for the organization to maintain that advantage if SST use does not create some form of value to the customer. If the SST does provide the customer with some sort of value, such as giving them more control over their experience or enhancing their experience in some way, then the customer might decide to use the technology and even return to use it again. If the customer continues to re-use the technology they will become more skilled at it, thus increasing their efficiency and lowering the total time needed to make a transaction. Over time this increased system efficiency will allow more customers to make transactions in a shorter period of time, thus increasing the organization's business potential (McNaughton, Osborne, & Imrie, 2002).

### *The Guest Experience*

#### *Guest Control*

As computer technology has advanced its uses have increased to the point that most people don't even realize that the technology is there (Shu-Sheng, 2004). With consumer acceptance of the constant presence of computers has come a natural increase in consumers' usage of computer applications. As consumers have become more technologically savvy organizations have begun to take advantage of these skills, using SSTs to give some or all of the control of product creation directly to the consumer. This

allows consumers to use technology to aid in the creation and consumption of many products and service that were once only done through direct contact with a representative of the organization. This turns the guest into a “quasi-employee” (Ford & Heaton, 2001). As a temporary employee the guest is able to perform the steps necessary to achieve the exact outcomes that they wish. When guests receive their expected outcomes they tend to have higher levels of satisfaction as well as a feeling of improved service quality (Dabholkar, et al, 2003).

### *Enhanced Service*

The proper implementation of technology can often give one organization a competitive advantage over another. In today’s business environment the issue is rarely whether or not a company should implement technology, but simply how to implement it effectively. An organization must consider several things when implementing a new SST. The business must determine the specific technologies for their situation that will aid in enhancing customer service, and provide value (Woodruff & Flint, 2003). This will have the effect of increasing customer loyalty and intention to return as well as the company’s profitability.

It should be noted that when addressing issues of self-service technology and customer service, management must be very aware of the wants and needs of the customer. It has been seen countless times that even though a technology may be the most advanced and have the ability to provide the best service from a business standpoint, it might not be accepted by consumers due to lack of usability. It is important for organizations to remember that the ultimate judge of the quality of customer service comes from the customer, not from the manager.

## Research Contribution

The contribution of this research is both academic and practical. First, this study will be among the first to comprehensively examine and test determinants of guests' intentions to utilize guest empowerment technologies. In addition, this study will expand upon the current body of knowledge in the areas of self-service technology acceptance, perceived ease of use of self-service technology, perceived usefulness of self-service technology, and improve the understanding of the relationships among perceived ease of use, perceived usefulness, intentions to use, task characteristics, technology characteristics, individual characteristics, and fit. The third contribution this study will make is through the development and extension of a multidimensional instrument to measure perceived ease of use, perceived usefulness, intentions to use, task characteristics, technology characteristics, individual characteristics, and fit.

From a practical standpoint, this study will provide valuable insights for hotel managers and self-service technology developers by identifying important factors for guest acceptance and utilization of such technologies. First, the findings of this study will aid managers in determining whether current GET provides a good fit to the tasks that guests perform as well as how the fit affects the utilization. Second, strategies may be developed in order to increase guest satisfaction as well as usage of GET. Third, the findings of this study will provide valuable information in the development of self-service software programs to offer the greatest net benefits to organizations and end users. Fourth, the measurement instrument can be applied to other hospitality organizations or business sectors to assess self-service technology. Fifth, managers can



use the theoretical framework and model to increase GET usage, retain customers, and improve profitability.

### Definition of Terms

The paper will utilize the following terms specific to the application and utilization of self-service and guest empowerment technologies:

*Fit*: The level at which the specific technology fits a user's personal needs (Goodhue, 1995).

*Guest Empowerment Technology (GET)*: Electronic systems that allow hotel guests to have more personal control over their stay in a hotel as well as systems that provide more convenience for guests without direct intervention from hotel staff. These technologies include systems such as in-room check-out systems, in-room entertainment systems, on demand printing services, lobby kiosks, and online reservation systems (Erdem, Schrier, & Brewer, 2009).

*Individual characteristics*: The attributes inherent to each specific user (Igbaria & Chakrabarti, 1990).

*Intention to use*: The level at which a user feels that they would utilize a specific technology (Moon & Kim, 2001).

*Interdependency of tasks*: Task characteristics associated with activities whose outcomes are directly related to one another (Fry & Slocum, 1984).

*Non-routineness of tasks*: Task characteristics expressed as having a variety of unrelated items (Perrow, 1967).

*Perceived ease of use:* The user's belief that using and/or learning a new technology will be relatively effortless (Davis, 1993).

*Perceived usefulness:* The user's belief that a new technology will improve the user's performance (Davis, 1993)

*Self-Service Technology (SST):* Technology that allows customers to create a service without direct involvement from a service provider (Meuter, et al, 2000).

*Task characteristics:* The attributes of a specific task that a user must accomplish in order to complete the task (Goodhue, 1995).

*Technology characteristics:* The attributes of a specific technology (Beatson, Coote, & Rudd, 2006).

## Chapter Summary

This chapter provided background for the utilization of self-service technology as well as the factors that have played a role to its utilization. Additionally, the contribution of this research was discussed along with an overview of the terms that will be used in this study. The following chapter will provide a review of literature addressing the practical and theoretical research on technology acceptance and utilization and self-service technology.

## CHAPTER 2

### REVIEW OF LITERATURE

Information technology has dramatically changed the way businesses operate (Meuter, et al., 2005). The evolution of self-service technology has also greatly altered the way in which customers interact with businesses (Ding, Verma, & Iqbal, 2007). Self-service technologies are commonly defined as technological applications that allow customers to produce a service independently from the direct involvement of a service provider (Meuter, Ostrom, Roundtree, & Bitner, 2000). There are multiple applications for self-service technologies. Based on the type of application and setup, customers can use self-service technologies either “on-site” or “off-site” (Dabholkar & Bagozzi, 2002). Examples of on-site applications include physical devices such as department store touch screen displays, hotel information kiosks and self check-out counters at grocery stores (Chandler, 1995). On the other hand, off-site applications are more information based than on-site applications. Common examples of off-site applications are automated telephone systems and online transaction websites (Dabholkar, 1994). The increasing presence of self-service technology has changed the role of the customer to that of an active participant in the service delivery process. As such the technology used to allow this change is seen as an enabler (Salomann, Kolbe, & Brenner, 2006) and has been given some attention in the general literature in recent years.

Before examining the recent literature it is important to understand the theoretical underpinnings that were the foundation of this research. The following sections will address the theories relevant to the utilization of technology and the acceptance of self-service and guest empowerment technologies.

### Technology Utilization

As previously suggested individuals who utilize technology that is available to them are able to perform tasks more efficiently and effectively than individuals who do not (Mathieson & Keil, 1998) assuming that the technology is well designed (Goodhue & Thompson, 1995). Technology utilization is the act of employing technology in order to accomplish specific tasks (Ferratt & Vlahos, 1998). It has been suggested by Goodhue and Thompson (1995) that factors such as social norms, availability, ignorance and habits may play a role in technology utilization. This is in line with the majority of research conducted on utilization, which is based on theories of individual behaviors and attitudes (Ajzen & Fishbein, 1980).

According to Goodhue and Thompson (1995), in order for technology to positively impact performance it must not only be utilized but also fit the needs of the user. The probability of an individual using a technology increases when there is a good fit. Additionally, a good fit increases the impact of the performance of the user regardless of the reasons that they may be utilizing the technology. While the performance of an individual is linked to the completion of a task or group of tasks, increased performance is actually the combination of improved efficiency and effectiveness.

Research indicates that utilization is made up of factors related to technology characteristics and individual performance (Goodhue, 1992). According to Goodhue (1992) the examination of these two factors together is important, as measurements of technology usage for extended periods alone may not accurately reflect user performance. Instead this may be an indication of poor technology design. It should also be noted that usage is less effective in measuring success when the usage is required (DeLone & McLean, 1992). When technology usage is non-voluntary it has been found that subjective norms have a great impact on an individual's intention to use technology. In a situation in which individuals are directed to use a technology they experience an internal unwillingness to comply with such regulations (Hartwick & Barki, 1994).

Utilization can be affected by several factors including system characteristics, task characteristics, individual characteristics, or the method of interaction between the system and the user (Trice & Treacy, 1988). As such, it is important to determine aspects that one will be measuring when examining utilization. Trice and Treacy (1988) reviewed multiple theories that employed variables useful in the examination of utilization. Two of these are the Theory of Reasoned Action (TRA) (Fishbein, 1979) and the theory of Task-Technology Fit (TTF) (Goodhue, 1998). TRA examines the differences in technology users' attitudes and involvement, and suggests that a person's intention to use a specific technology will predict their actual use of that technology (Fishbein, 1979). TTF theorizes that an individual's choice to use a technology will result in an improvement in performance as explained by multiple variables (Goodhue, 1998). The level at which a technology fits the actual task or tasks that it was designed to support can also have an impact on performance (Trice & Treacy, 1988).

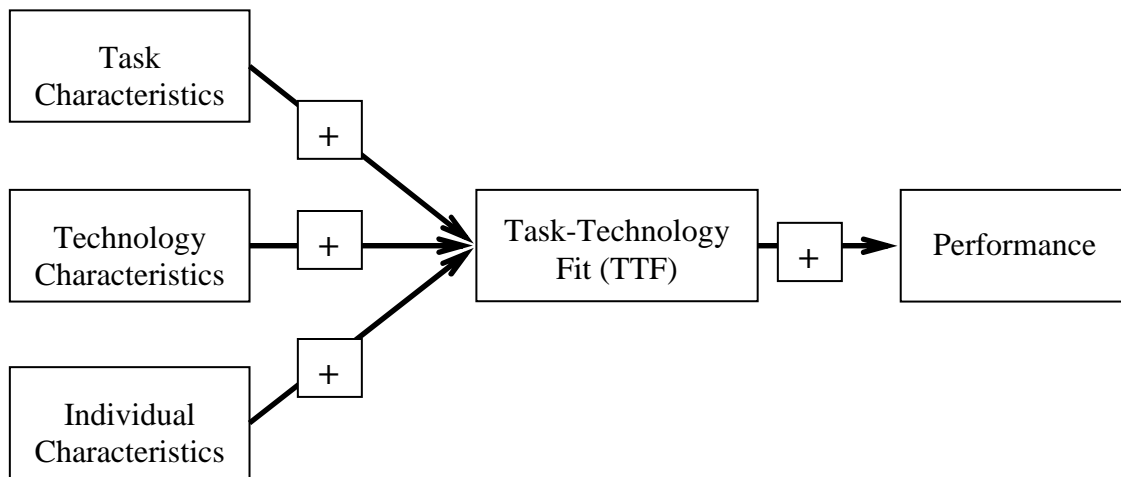
## Perceived Ease of Use and Usefulness

In an attempt to determine effective measures for predicting and examining technology usage two studies were conducted by Davis (1989) and Davis, Bagozzi, & Warshaw (1989). Later research has confirmed the findings of these studies (Adams, Nelson, & Todd, 1992). Davis (1989) theorized that the constructs of perceived usefulness and perceived ease of use were determinants of technology usage and acceptance. According to Davis perceived usefulness is the level to which a person feels that the use of a particular technology would enhance his or her performance. Additionally, perceived ease of use is the level to which a person feels that the use of a particular technology is free of effort.

One of the significant findings of Davis's (1989) study was that of the relationships between perceived usefulness, perceived ease of use and utilization. It was found that perceived ease of use was less significant in determining actual usage than was perceived usefulness. The implications of this were that users were more likely to utilize a technology based on the level at which a technology performs a specific function that meets the needs of the user. The level of difficulty involved in using a technology was only a secondary consideration for users. These findings suggest that technology users are willing to tolerate a certain level of difficulty if the technology is capable of performing necessary functions. However, ease of use of a technology does not make up for those technologies that do not provide the user with the desired applications.

## Task Technology Fit

Goodhue and Thompson (1995) theorized that task technology fit (TTF) is the “degree to which a technology assists an individual in performing their portfolio of tasks.” TTF is used to measure the match between a user’s requirements for a specific task, the user’s abilities and the functionality of a technology. TTF is seen to be higher when the functionality of a technology and the user’s requirements are similar. Additionally, TTF is lower if the functionality of the technology is less adequate in meeting the needs of the user or when the demands of a task are increased. Individuals have a greater tendency to utilize technology if the capabilities of the technology fit the needs of the individual. Therefore, TTF can be a good predictor of technology utilization. Figure 1 shows the relationship between the task characteristics, individual characteristics, technology characteristics, and task technology fit as outlined by Goodhue (1988).



*Figure 1.* Relationships of constructs in the task technology fit model.

The completion of a specific task is directly tied to an individual's performance (Goodhue & Thompson, 1995). A higher level of individual performance can suggest improved effectiveness and efficiency. This in turn can result in higher quality output. A high TTF increases both the chances that a technology will be utilized and the user's performance. It has been proposed by Goodhue and Thompson that a high TTF leads to an increase in user performance because the technology has a tendency to have more of a direct fit with the needs of the user.

The level of TTF is based on system evaluations performed by users of a specific technology. These evaluations measure the user's perceptions of the characteristics of a specific technology. These evaluations are usually given on a continuous scale from positive to negative ratings. A positive rating of a technology from a user would indicate that the technology is improving the user's performance, while a negative rating may suggest that the technology is hindering the user's performance (Chandler, 1995).

In order to ensure that the measurements are accurate, these TTF evaluations must be associated with the characteristics of the technology being evaluated. Similarly, the evaluation of ease of use in TTF must be associated with the user's performance (Goodhue, 1995). Goodhue (1995) conducted research in which individual users were asked to rate the level of fit of technology based on the tasks they had to perform. This study was significant as the previous research had mainly focused on technology characteristics from a large scale organizational view rather than the point of view of individual users

The theoretical underpinnings of TTF are based in multiple areas of research. These areas are structural contingency theory, behavior decision theory, and work



adjustment theory. Additionally, TTF incorporates factors similar to theories of information technology (IT) users' behaviors and attitudes. Some of these models, discussed below, are the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), the Theory of Planned Behavior (TPB) (Ahzen, 1991) and the Technology Acceptance Model (TAM) (Davis, et al., 1998).

#### Structural Contingency Theory

Structural Contingency Theory suggests that the better an organization's context and structure fit together the better the organization will perform (Drazin & Van de Ven, 1985). Similarly, TTF suggests that a higher level of fit between the needs of a user and the technology that meets those needs will result in a higher level of performance by the user. In order to demonstrate this Goodhue based some of his proposed characteristics of fit on research conducted by Venkatraman (1989) which utilized six constructs of fit: (a) moderation, (b) mediation, (c) matching, (d) gestalts, (e) profile deviation, and (f) covariation.

#### Behavior Decision Theory

According to Goodhue (1995), TTF is tied to the cost/benefit aspects of behavior decision theory. The cost/benefit framework indicates that users evaluate the costs and benefits associated with utilization before making a decision on whether to use a technology (Davis, 1989). In behavior decision theory cost refers to the correctness, speed, and justifiability of making the decision. Benefits are related to the amount of mental effort that would be required to make a decision. In this framework a user has the option to choose whether or not to utilize any form of technology. However, TTF does

not consider this factor. Instead, TTF assumes that use of some type of technology is required (Goodhue, 1995).

### Work Adjustment Theory

Work adjustment theory examines the connection between job requirements and an individual's abilities. This is done in order to assess the level at which an individual can adequately perform a job or task. As noted by Goodhue (1992), assessment of technology satisfaction is ultimately related to job satisfaction. However, research has shown only a weak link between performance and job satisfaction (Dessler, 2008). In response to this weak link, Goodhue (1992) points to the importance of understanding the connection between job satisfaction and user evaluations.

In a study by Dawis, Lofquist, and Weiss (1968), individual satisfactoriness and job satisfaction were examined. Individual satisfactoriness was defined as the level of an individual's abilities to meet the requirements of a task, and job satisfaction was defined as how well an individual's needs are met by a specific job. Goodhue (1988) expanded on these concepts by proposing measurements for information system (IS) satisfactoriness and IS satisfaction. IS satisfactoriness was defined as the degree to which IS met the task needs of a user. Likewise, IS satisfaction was defined as the degree to which IS met the user's needs.

Goodhue (1988) proposed the task system fit (TSF) model as a means of evaluating IS satisfactoriness. TSF would be used to determine the level of adequacy an information system was to the task needs of a user. This is subtly different from measurements of IS job satisfaction in that the user would be asked to rate a system's

level of effectiveness in supporting their feeling of control in accomplishing a task.

Additionally, the TSF model was utilized in order to have to rate the level of appropriateness of a system for completing a specific task.

Goodhue (1992) suggests that much of the research that utilizes user evaluations lacks the ability to separate a user's personal needs from their task needs. In his research he proposed that performance could be better measured if the focus of user evaluations was directed more toward how well a system fits the requirements of a task. Goodhue theorized the development of TTF as a means to determine the method in which fit should be used as one of multiple constructs when employing user evaluations.

### Theory of Reasoned Action

Ajzen and Fishbein are widely recognized as innovators in the application of the theory of reasoned action (TRA). The basic principle behind their research is that human behaviors are controlled by conscious actions. In other words, individuals most often to some degree evaluate the potential ramifications of their actions before making a decision whether or not to perform a specific action (Ajzen & Fishbein, 1980).

The two main factors used in TRA to explain an individual's intentions to act are that person's evaluation of the performance of the action and their perception of the level of socially accepted norms of the action. TRA also suggests that a person's attitudes are a function of their individual beliefs (Ajzen & Fishbein, 1980).

As explained by Trice and Treacy (1988), TRA as utilized by Ajzen and Fishbein (1980) is often used by researchers in order to address the connections between individuals' attitudes and beliefs and their behaviors. Trice and Treacy (1988) utilized

TRA to examine the specific area of technology utilization. As addressed in their study, actual technology usage is predicted by a person's intention to use a specific technology. An individual's personal beliefs as they relate to the benefits of using a technology also have an influence on that person's decision to use a specific technology. Factors such as education level, age, and computer experience were found to have an effect on personal beliefs regarding technology. These individual characteristics also have the potential to exert some level of influence on an individual's usage decisions (Trice & Treacy, 1988).

### Theory of Planned Behavior

The theory of planned behavior (TPB) is based on TRA and used to explain individual's specific behaviors (Ahzen, 1991). In a study by D'Ambra and Rice (2001) TPB was used in order to develop a model with which to examine users' intentions to utilize technology within organizations. Based on their research it was found that participants' intentions to perform specific activities such as technology usage had a strong influence on their behavior. It was also found that a person's utilization intentions were also influenced by his or her perceived level of control of a situation, societal pressures toward a behavior, and his or her attitude about the results of a specific action.

### Technology Acceptance Model

Developed by Davis (1986) as an extension of TRA and TPB, the technology acceptance model (TAM) was created as a means to explain technology users' behavior. The principal constructs of TAM are technology ease of use (EU) and perceived usefulness (PU). In creating TAM Davis hypothesized the primary determinant of

technology usage to be the user's behavior intentions to use a technology. It has been found that users' attitudes toward technology and the PU of a particular technology determine behavioral intentions (Garrity, Glassberg, Kim, Sanders, & Shin, 2005).

The research of Dishaw and Strong (1999) shows how TAM differs from its predecessors. As previously mentioned, TAM utilized ease of use and perceived usefulness as external variables. These variables have influence over users' attitudes, intentions to use, and actual usage. What makes TAM different from many previous models is that it does not include subjective norms as one of its constructs in determining actual technology usage. Research has also found the framework of TAM for directly utilizing behavior intentions as a means of predicting utilization to be sound, as other factors that may contribute to behavior do so only indirectly (Davis, et al., 1989). As the name suggests TAM is a model for the evaluation of technology acceptance. However, because of its widespread usage and popularity among researchers TAM is often used in research as support for many acceptance theories. In many cases TAM is used as a substitute for a full theoretical foundation.

### Self-Service Technology Research

While the previous sections discussed the significant literature on the theories and models that are the foundation of technology utilization research, the following sections will examine the literature as it pertains to self-service technology. A review of relevant literature on the subject of self-service technology found that the bulk of the literature can be categorized into two groups: (a) user focused and (b) technology focused. The majority of the user focused group tends to be quantitative in nature and more robust than

the technology focused group. The user focused group tends to address the technology primarily as a means to studying personal traits such as loyalty, preferences, and attitudes. The technology focused group is generally more qualitative and tends to center on the functions and features of applications.

### *User Focused SST Research*

This section will outline some of the major research in self-service technology. As previously noted, the majority of user focused self-service technology research examines individual personal traits in order to determine reasons why consumers prefer one type of technology over another. The predominate trends in SST literature reveal that the most common areas toward which studies on individual traits have been directed include attitudes, expectations and perceptions, customer preferences, satisfaction and loyalty, customer performance, and customer differences and CRM.

### *Attitudes, Expectations and Perceptions*

Dabholkar and Bagozzi (2002) examined the effects of consumer traits and situational factors on participants' attitudes toward using self-service technology. This was done through an experimental design with perceived wait time and social anxiety as the treatments. Each participant was presented with a scenario involving a fast-food restaurant touch screen ordering system. The scenarios varied slightly based on the amount of time it took to use the technology. The study found that the factors affecting customers' willingness to use self-service technologies were perceived ease of use, the reliability of the technology, and the level of enjoyment or entertainment that the technology provided the user.

Cai and Jun (2003) examined the perceptions of online service quality of online buyers and online information seekers. This study found four dimensions that influenced online service quality perceptions: (a) web site design/content, (b) trustworthiness, (c) prompt/reliable service, and (d) communication. All four factors were found to have an influence on online buyer's perceptions. However, only the factors of web site design/content, trustworthiness, and communication had a significant influence on information searchers' perceptions of online service quality.

Oyedele and Sompson (2006) studied consumers' decisions to use self-service technology. Specifically, they examined the potential effects of locus of control, autonomy, self-efficacy, technology anxiety and time pressure on self-service technology usage decisions. Their findings indicated that usage of self-service technology may be governed by perceptions of self-efficacy, intervention of fate or chance and the likelihood of obtaining the end result or goal through one's own efforts. This suggests that individuals who are unfamiliar with self-service technology may be less likely to use it. Individuals with high levels of anxiety toward technology were also found to be less likely to utilize self-service technology. This study also determined that the presence of deadlines and time constraints had no significant effect on the self-service technology usage decisions.

Chang and Yang (2007) evaluated the performance of airport kiosks and examined services provided by kiosks which made them more attractive to passengers. The results demonstrated that potential kiosk users expect their experience with a kiosk to be highly controlled. It was also found that airlines sometimes entice potential kiosk

users to begin using kiosks by offering additional benefits such as seat selection privileges.

Reinders, Dabholkar, and Frambach (2008) investigated the effects of forcing consumers to use self-service technology by making it the only option available to customers. This was done through an experimental design utilizing a railway ticketing and travel information system. The study found that forcing consumers to use self-service technology led to severe negative attitudes toward both the self-service technology and the service provider. Customers forced to use self-service technology were less likely to spread positive word-of-mouth and had increased switching intentions. This study also found that the negative effects of forced use of self-service technology were reduced when the customers were offered some form of interaction with an employee as a back-up option. In addition, individuals who had previously used self-service technology had less negative attitudes toward using the forced self-service technology.

Zhao, Mattila, and Tao (2008) looked at the way in which post-training self-efficacy influences perceptions and ultimately usage of self-service technologies. The researchers suggested that a high level of high post-training self-efficacy will reduce technology usage anxiety, increasing the perceived ease of use associated with self-service technologies. The results indicated that post-training self-efficacy had a positive impact on ease of use and customer satisfaction with the self-service technology experience, and that ease of use reduced the effects of technology anxiety, increasing the chances of future usage.



### *Customer Preferences*

Kincaid and Baloglu (2005) examined customer usage of self service technology in a casual dining restaurant. Specifically, the paper discussed the evolution of self-service technology, its benefits and its challenges. The study, conducted in a casual dining restaurant in St. Peters, Missouri, found that the factors that customers liked most about a restaurant self-service system were convenience, ease of use, fast service, and privacy/lack of personal contact. Additionally, the findings revealed that customer preferences varied according to the participants' demographic characteristics. This suggests that technology should be customized to specific target markets.

Ding, et al. (2007) examined self-service technology used in banking and other financial transactions. This study looked at the elements preferred by customers in various market segments. This was done through an examination of multiple customer segments and their desired preferences in self-service and personal service experiences with online financial transaction. It was found that the features that customers preferred when using online financial services vary across customer segments. While both self-service oriented and professional assistance oriented customer segments were interested in cost savings, the self-service oriented segment was more price sensitive. It was also discovered that self-service customers rate the most significant factors for utilizing self-service technology to be time and cost saving, personal control, and the avoidance of personnel contact.

### *Satisfaction and Loyalty*

Yen (2005) investigated consumer satisfaction attributes as they relate to Internet-based self-service technology. This study suggests that the importance of the attributes in

determining consumers' satisfaction varies based on the customers' readiness to adopt the technology. The results showed that the level of satisfaction that consumers experience with Internet-based self-service technology is affected not only by the benefits associated with its usage (i.e., efficiency and convenience) and the attributes that reduced barriers to use (i.e., ease of use and perceived control), but also by how well it performs its expected functions. The results suggest that all consumers do not equally appreciate the value created by technology.

Beatson, Coote, and Rudd (2006) examined how the use of self-service technology affected customer satisfaction. The results showed that personal service is one of the key factors that are important to hotel guests. The study also revealed that customer satisfaction leads to customer loyalty. The attributes of SST were shown to have an impact on customer loyalty and successful usage of SST was shown to have a positive relationship with the level of loyalty a customer has to an organization.

Liljander, Gillberg, Gummerus, and Riel (2006) investigated the effects of technology readiness on airline customers' attitudes towards using self-service check-in and their adoption of and evaluation of a self-service check in system on the Internet. These factors were examined based on perceived service quality, customer satisfaction and loyalty. The study found that technology readiness had little impact on customer attitudes towards self-service technology adoption and evaluation.

#### *Customer Performance*

Willner (2004) investigated the use of a self-service ATM system that captured real time data. The purpose of this study was to determine methods to optimize ATM customer performance. Additionally this study tested the hypothesis that if an

experiment was conducted in its natural environment as opposed to a laboratory, neither age nor education level would predict human error. The results of this study showed that user age was a predictor of time spent per transaction but was not a predictor of human error. Education level was also a predictor of time spent per transaction but not of human error.

In addition to the results of this research this study is significant in that it is among the first studies on self-service technology to be performed in a real world setting. This study analyzed data that was collected via the technology on which the customers performed their normal banking transactions. Little change was made to the normal routine of the customer's experience. Thus, there were little to no factors influencing the customer's activities that would not have otherwise been present.

Selnes and Hansen (2001) investigated the effects of self-service applications in instances where the customer had a social bond with one or more of the employees involved in the transaction. This study also tested two theoretical models for self-service effects on social bonding and customer loyalty. The results of this study suggest that: (a) personal services have a positive effect on social bonding and customer loyalty, (b) switching to self-service applications from personal service will have a negative effect on social bonds in relationships that have low complexity, and (c) switching to self-service application from personal service will have a positive effect on social bonds in relationships that have high complexity. Additionally, this study suggests that the utilization of self-service applications without a minimum level of personal interaction may have a negative impact customer loyalty.

### *Customer Differences and CRM*

Fisher and Beatson (2002) proposed that the undifferentiated use of self-service technology across international hotel chains without consideration of national culture may have a negative impact on customer service and organizational performance. This was tested by examining barriers to the acceptance of self-service technology and specific issues related to international hotels, including cultural issues related to customer service expectations.

McPhail (2004) looked at the level of usage of self-service technologies in the banking sector for individuals over the age of 50. The findings showed that there is a large group of older adults who use self-service banking technologies. This group contained all types of adopter categories (i.e. innovators, early adopters, early majority, late majority and laggards). This is a significant finding as it contradicts the widely held belief that older adults are technophobic. For those individuals that did not utilize self-service technologies it was determined that in order to convince them to transition to use the technologies the organizations implementing the self-service technologies would need to demonstrate that the benefits of adopting the technology would be greater than the costs incurred by not using them.

Salomann, et al. (2006) examined the current applications of self-service technologies and how they fit into the relationships that businesses have formed with customers. They also proposed trends that are expected to be utilized in future self-service technologies. The findings of the study showed that the most common reason that companies chose to use self-service technologies to assist with customer

relationships was in order to reduce cost. Companies also felt that the use of self-service technologies helped to increase customer satisfaction and loyalty.

### *Technology Focused SST Research*

As previously stated the majority of Technology Focused self-service technology research tends to be qualitative, though this is not always the case. The literature in this area largely centers on the functions and features of applications. Some of the more recent studies in Technology Focused self-service technology follow.

Rowley (2000) used a case study approach to investigate the use of loyalty card kiosks in select British stores. By inserting a loyalty card into the kiosk, participants were able to receive benefits including recipes, special promotional offers, informational videos, and other customer service options. The author argued that loyalty kiosks present an opportunity to offer customized services based on consumers' purchasing habits, and suggested that in order for this type of program to be successful the loyalty cards need to be an integral part of the relationship between the retailer and customer, not just a hi-tech gimmick.

A conceptual paper by Stockdale (2006) examined the factors of self-service technology as they related to (a) identifying the online customer, (b) website design, (c) information gathering and handling, (d) communication with customers, and (e) loyalty and trust. Stockdale suggested that using self-service technologies can benefit companies by saving costs and attracting new customers. In order to do this, self-service technologies must be developed that are easily accessible and appropriate for their tasks.

As can be seen from the above review, the majority of the literature on SST falls into subcategories either of user focused or technology focused research, and points

toward specific applications and reasons for utilizing SST in the hospitality and more specifically in the hotel industry. Some of these factors include perceived ease of use, users' contentment with the technology, level of control, convenience, satisfaction, loyalty, service quality, individual preferences and characteristics, technology fit, and the technology characteristics. Table 1 summarizes the findings of the literature reviewed.

*Table 1*

*Methodological Review of Self-Service Technology Research*

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Attitudes, Expectations and Perceptions				
Reinders, Dabholkar & Frambach (2008)	Railway station	Effects of forcing consumers to use SST	Experimental design	Forcing consumers to use SST leads to negative attitudes toward using the SST.  Negative effects of forced use of SST were reduced when the customers were offered some form of interaction with an employee.  Previous usage of SST resulted in less negative attitudes toward using the forced SST.
Zhao, Mattila & Tao (2008)	Library	Influences of post-training self-efficacy on perceptions and usage of SST	Survey	Post-training self-efficacy had a positive impact on ease of use and customer satisfaction.  Ease of use reduced the effects of technology anxiety.

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Chang & Yang (2007)	Taiwan Taoyuan International Airport	Users' expectations of airport kiosks	Survey	Kiosk users expect their experience to be highly controlled.  Airlines entice kiosk users by offering additional benefits.
Oyedele & Sompson (2006)	College students in the southern United States	Effects of locus of control, autonomy, self- efficacy, technology anxiety and time pressure on SST usage decision	Survey	High levels of anxiety toward technology may affect decisions to utilize.  Deadlines and time constraints had no effects on SST usage decisions.
Cai & Jun (2003)	Midwest and Southwest regions of the US	Users' perceptions of online service quality	Survey of convenience sample	Determined dimensions that influenced online service quality perception.



Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Dabholkar & Bagozzi (2002)	Restaurant	Effects of consumer traits and situational factors on attitudes toward using self-service technology	Scenario based experimental design	Factors affecting customers' willingness to use self-service technologies are: 1. Perceived ease of use. 2. Reliability of the technology. 3. Level of enjoyment/entertainment provided.
Customer Preferences				
Kincaid & Baloglu (2005)	Restaurant	Benefits and challenges of SST	Electronic Survey	Factors that customers liked most about the system was convenience, ease of use, fast service, and privacy/lack of personal contact.  Customer preferences varied by demographic.

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Satisfaction and Loyalty				
Ding, Verma & Iqbal (2007)	Online banking	Elements preferred by customers based on various market segments	Survey & Web-based scenarios	Self-service oriented customers were more price sensitive than professionally oriented customers. Self-service customers rate the most significant factors for utilizing SST to be time and cost saving, personal control, and the avoidance of personnel contact.
Beatson, Coote & Rudd (2006)	Hotels in a metropolitan area in Australia	Impact of self-service technology on consumer satisfaction and on a multidimensional measure of consumer commitment	Guest survey over a two-month period	SST attributes appear to have an impact on all dimensions of commitment. Successful use of SST may tie consumers to a service provider.

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Liljander, Gillberg, Gummerus & Riel (2006)	European airline	Effects of technology readiness on airline customers'	Paper and online surveys	Technology readiness had little impact on customer attitudes towards SST adoption and evaluation.
Yen (2005)	Online travel agencies	Consumer satisfaction attributes as they are related to Internet-based SST	Survey	All consumers do not equally appreciate the value of technology.
Customer Performance				
Willner (2004)	Bank ATM	Methods to optimize customer performance	Experimental design	User age and education were predictors of time spent per transaction.  User age and education were not predictors of human error.

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Selnes & Hansen (2001)	Bank	Effects of SST in instances where customers had a social bond with the employees	Telephone interviews	Personal services have a positive effect on social bonding and customer loyalty.
Customer Differences and CRM				
Salomann, Kolbe & Brenner (2006)	Companies in Germany, Austria, and Switzerland	SST fit with CRM	Online survey	Companies chose to use self-service technologies to: <ol style="list-style-type: none"> <li>1. Reduce costs.</li> <li>2. Helped increase customer satisfaction and loyalty.</li> </ol>
McPhail (2004)	Bank	Level of usage of self-service technologies as related to age	Survey	Older adults use self-service banking technologies.

Authors	Setting	Technology/ Theory Examined	Methodology	Results/Recommendations
Fisher & Beatson (2002)	International hotel chain	SST utilization in international hotel chains	Survey	Hotel guests from high power distance cultures are less likely to accept self-service technology.  Hotel guests from high uncertainty avoidance cultures will be less likely to utilize self-service technology.
Technology Focused SST Research				
Stockdale (2006)	An airport, a railway station, a car rental facility, a hotel lobby and a shopping mall	Kiosks with features for custom service delivery	Case Study	Kiosk should be utilized based on: <ol style="list-style-type: none"> <li>1. Kiosk design and location.</li> <li>2. User profile.</li> <li>3. Information architecture.</li> <li>4. Interface design.</li> <li>5. Communication.</li> <li>6. Commerce.</li> </ol>
Rowley (2000)	British stores	The usage of loyalty card kiosks	Case study	Loyalty kiosks present an opportunity to offer customized services.

## Theoretical Framework

The previous section presented the relevant research in self-service technology. This section will address the theoretical framework used for this study and the development of the conceptual model. The theoretical foundation for the conceptual model used in this study is based on the combination of models utilized to explain technology acceptance and technology fit.

### *Models for Technology Acceptance*

Research on the emergence and adoption of new technologies in various industries has been conducted for several years (Rodgers, 1983; Adams, Nelson, & Todd, 1992; Al-Gahtani & King, 1999; Mathieson, 1991; Wang & Qualls, 2007). Theories and models are abundant on the topic (Table 2); the previously mentioned Technology Acceptance Model (TAM) is one of the most prominent (Davis, 1986; Wu & Wu, 2005; Zain, Rose, Abdullah, & Masron, 2005). Table 2 outlines several current technology related theories and models. This table shows that a large portion of technology research has utilized some form of TAM. The robustness of TAM is discussed in the work of Kloppe and McKinney (2004) in which they discussed the applicability of TAM in determining technology acceptance in a wide range of businesses including the online self-service environment. TAM is derived from the Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Theory of Reasoned Action (TRA) which examines individual's actions based upon their intentions (Ajzen & Fishbein, 1980). The main principle of TAM is that technology is implemented and utilized based on its perceived ease of use and perceived usefulness (Lu, Yu, Liu, & Yao, 2003). It is important to note that TAM is a good predictor of technology acceptance only when the users willingly choose to use

the technology. If an individual is forced to use a specific technology, either through a lack of options (Reinders, et al., 2008) or coercion by others, then TAM is not a good indicator of acceptance (Dishaw & Strong, 1999).

TAM is sometimes used in an attempt to determine the factors involved in the preference of one technology versus another. Research in this area has utilized modified TAM models that include external factors such as the environment, the organization, the individual, and the task (Wu & Wu, 2005). In recent years, researchers using modified technology acceptance models have included factors of satisfaction and disconfirmation (Bhattacharjee & Premkumar, 2004). Despite its widespread application in the general business sector, limited work has been published on TAM's application for guest empowerment technology as it relates to the hotel industry.

#### *Technology Fit Models*

While the major focus of TAM is on users, it lacks the ability to account for the actual tasks associated with using a specific technology (Goodhue & Thompson, 1995). According to Goodhue and Thompson (1995), a technology will only be utilized if the goals that the user intends to accomplish are a good fit with the technology. One model which does examine the goals and activities of the user is the Task-Technology Fit (TTF) model.

The main focus of the Task-Technology Fit model, as the name suggests, is the level at which a particular technology fits with a task that the user is attempting to accomplish (Goodhue & Thompson, 1995). TTF examines technology usage based on four constructs: (a) Task Characteristics, (b) Technology Characteristics, (c) Individual Characteristics, and (d) Utilization. These four items make up the overall construct of

Table 2

*Technology Related Theories & Models*

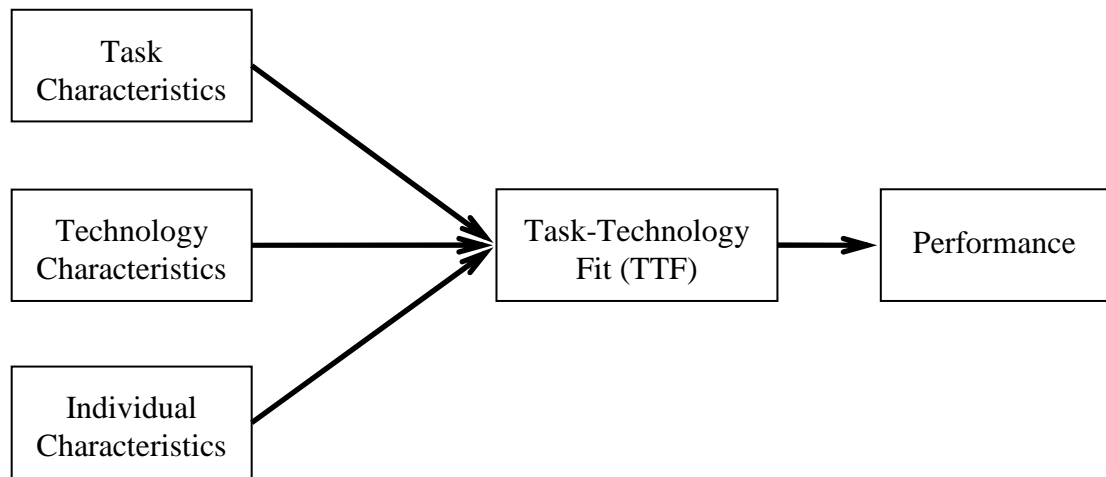
Researcher (Year)	Theory / Model
Fishbein & Ajzen (1975)	Theory of Reasoned Action (TRA)
Ajzen & Fishbein (1977)	Theory of Planned Behavior (TPB)
Rodgers (1983)	Innovation Diffusion Theory (IDT)
Davis (1989)	Technology Acceptance Model (TAM)*
Mathieson (1991)	TAM with Theory of Planned Behavior (TPB)*
Adams, Nelson, & Todd (1992)	Replication of Davis' TAM study*
Davis (1993)	Refined TAM*
Goodhue & Thompson (1995)	Task-Technology Fit (TTF) Model
Igbaria, Guimaraes, & Davis (1995)	Integrated Conceptual Model of Computer Usage*
Taylor & Todd (1995)	TAM and decomposed TPB*
Chau (1996)	Modified TAM*
Agarwal & Prasad (1997)	Relationship between Innovation and Adoption*
Agarwal & Prasad (1998)	Personal Innovativeness in IT*
Agarwal & Prasad (1999)	Relationship between individual differences and IT acceptance*
Al-Gahtani & King (1999)	TAM Evaluation*
Hu, Chau, Sheng, & Tam (1999)	TAM in telemedicine technology*



Researcher (Year)	Theory / Model
Jiang, Hsu, Klein, & Lin (2000)	Modified TAM to add usage behavior*
Venkatesh & Davis (2000)	TAM2 – used for social influence*
Chau & Hu (2001)	Reexamined TAM and decomposed TPB*
Horton, Buck, Waterson, & Clegg (2001)	TAM in intranet usage*
Kwon, Kim, & Lee (2002)	Information design and bidding behavior model*
McKinney, Yoon, & Zahedi (2002)	Model for Expectation-Disconfirmation Effects on Web-Customer Satisfaction (EDEWS)
Lu, Yu, Liu, & Yao (2003)	TAM for wireless internet*
Muylle, Moenaert, & Despontin (2004)	Dimensional structure of web site user satisfaction*
Calero, Ruiz, & Piattini (2005)	Web Quality Model (WQM)
Singh, Dalal, & Spears (2005)	Relationship between involvement, understanding, and behavioral intention*
Song & Zahedi (2005)	Belief Reinforcement Model (BRM)
Wu & Wu (2005)	TAM-IDT Hybrid*
Aldwani (2006)	TAM in attitudes toward websites*
Hsiao & Chou (2006)	Gestalt-like perceptual measure
Zviran, Glezer, & Avni (2006)	User-based web design criteria

*Note.* \*research based on TAM.

Task-Technology Fit which leads to user performance (Goodhue & Thompson, 1995). The basis of the TTF model is that when given more than one option technology users will use the technology that provides them with the most benefits. As explained by Goodhue & Thompson (1995), it is important to note that when the construct of utilization is required it is not necessary to consider it in the TTF model as all users will show the same outcome for this variable. The non-required utilization TTF model is shown in Figure 2.



*Figure 2. Task-Technology Fit (TTF) model.*

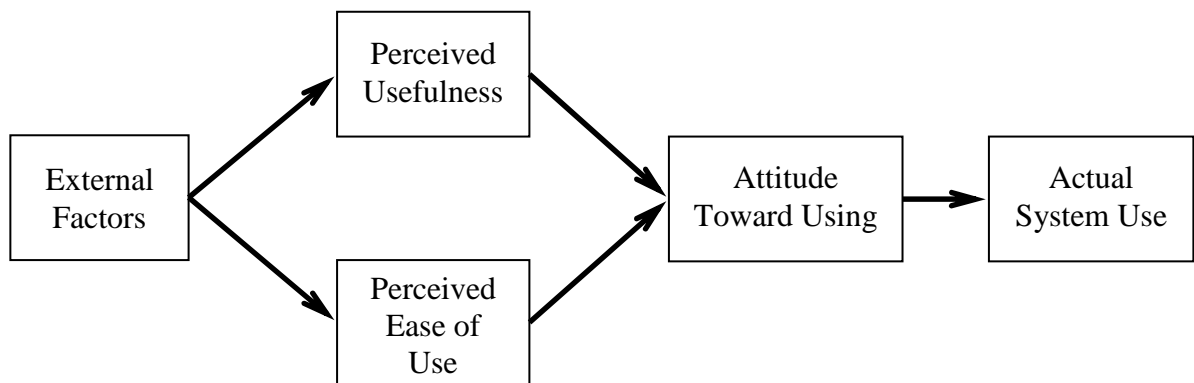
From: Goodhue, D. (1995). Understanding user evaluations of information systems. Management Science, 41 (2), 1827-1844.

### *Combined TAM/TTF Model*

TAM and TTF by themselves are good predictors of technology adoption. However, it has been suggested that a combination of the two models would be a better indicator of technology acceptance (Dishaw & Strong, 1999). The model constructed by Dishaw and Strong (1999) utilized for the evaluation of software development in the

general business sector incorporates constructs from both TAM and TTF and was found to be a better predictor of technology adoption than either one alone.

The creation of a hybrid TAM/TTF model is logical as both individual models examine various portions of technology acceptance which will eventually lead to an accept or reject decision by the user. An examination to TAM developed by Davis (1993) shown in Figure 3 and the TTF model developed by Goodhue (1995) shown in Figure 2 reveals that the two models have similar attributes.

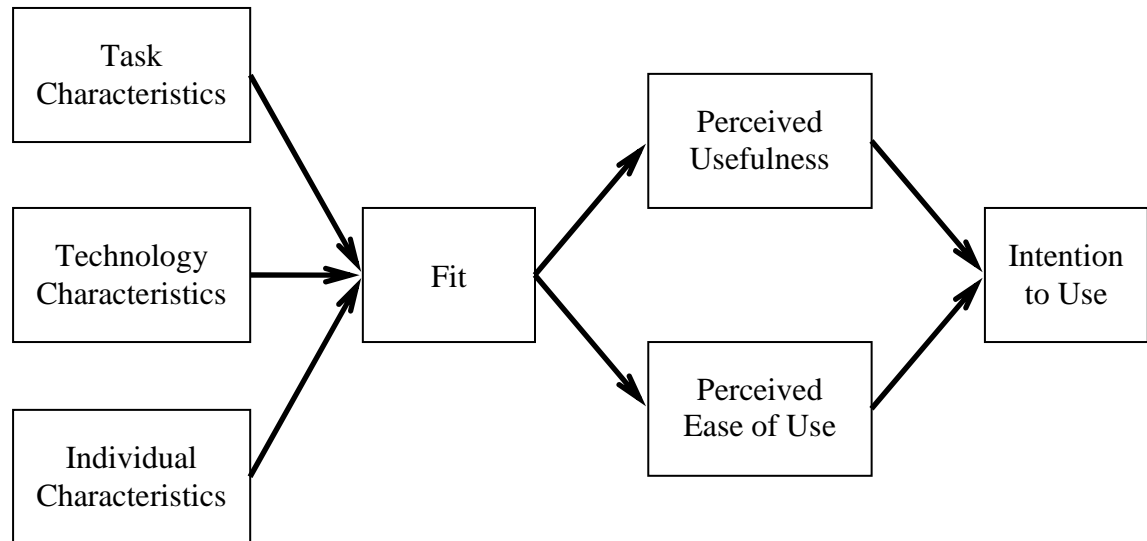


*Figure 3. Technology Acceptance Model (TAM).*

From: Davis, F. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38 (3), 475-487.

In the Davis (1993) Technology Acceptance Model the construct of external factors is used to account for a wide range of variables that may have indirect influence on system usage. Unlike TAM, Task-Technology Fit (Goodhue, 1995) examines specific constructs which lead to user's technology utilization intention. Thus, by substituting the specific TTF constructs of Task, Technology, and Individual characteristics for the

construct of External Factors in TAM a refined hybrid TAM/TTF model (Figure 4) similar to that developed by Dishaw and Strong (1999) is revealed. However, unlike Dishaw and Strong (1999) the hybrid TAM/TTF model in this study will focus on testing guest utilization of specific GETs common to the hotel industry.



*Figure 4.* Hybrid TAM/TTF model.

#### Purpose of This Study

The purpose of this study was to determine and quantify the factors that impact hotel guests' intentions to seek and utilize guest empowerment technologies – a term also used to describe most hotel self-service technologies. By adapting the work of Dishaw and Strong (1999) in creating a Hybrid Technology Acceptance Model (TAM)/ Task-Technology Fit (TTF) model the goals of this study will be accomplished through three objectives:

- 1) To determine if there are relationships between task characteristics, technology characteristics, and individual characteristics and the Task-Technology Fit model
- 2) To determine if there were relationships between TTF and Perceived Ease of Use and between TTF and Perceived Usefulness
- 3) To determine if there were relationships between Perceived Ease of Use and Perceived Usefulness, and Intention to Use

### Research Hypotheses

This study will build upon previous research in order to develop eight hypotheses. These hypotheses will be comprised of constructs adapted from TTF and TAM. These constructs will be: Task Characteristics, Technology Characteristics, and Individual Characteristics, Fit, Perceived Ease of Use, Perceived Usefulness and Intention to Use. It is hypothesized that Task Characteristics, Technology Characteristics, and Individual Characteristics have a positive relationship with Fit. Additionally, it is hypothesized that Fit has a positive relationship with Perceived Ease of Use and Perceived Usefulness. Finally, it is hypothesized that Perceived Ease of Use and Perceived Usefulness have a relationship with Intention to Use. Table 3 summarizes the research hypotheses.

### Research Questions

As can be seen from the review of literature on SST in the hospitality industry there is a gap in the research that focuses directly on the SST components of hotel guest empowerment technologies. Based on the purpose of this study, the research questions for this study are as follows:

- 1) What are the factors that affect guest usage of hotel Guest Empowerment Technologies?
- 2) What are the relationships between the factors of the Task Technology Fit Model as applied to GETs?
- 3) What are the relationships between the factors of the Technology Acceptance Model as applied to GETs?
- 4) Is there a correlation between the factors of the Task Technology Fit Model and the Technology Acceptance Model as applied to GETs?

*Table 3*

*Hypotheses of Hotel Guests' Intentions to Utilize Guest Empowerment Technologies*

Hypotheses	Relationships
H1:	Task characteristics have a positive relationship with Fit
H2:	Technology characteristics have a positive relationship with Fit
H3:	Individual characteristics have a positive relationship with Fit
H4:	Fit has a positive relationship with Perceived Ease of Use
H5:	Fit has a positive relationship with Perceived Usefulness
H6:	Perceived Ease of Use has a positive relationship with Intention to Use
H7:	Perceived Usefulness has a positive relationship with Intention to Use

### Chapter Summary

The objective of this chapter was as follows: (a) provide an overview of the theories related to the utilization of technology and the acceptance of self-service technologies, (b) examine the literature related to the usage of self-service technologies,

(c) discuss the models used in this study, and (d) address the research questions posed in this study. These research questions are not only important in addressing gaps in the current literature but also for aiding hotel managers and GET developers in more effective implementation of Guest Empowerment Technologies. By having an understanding of the ways in which the components of technology construction and the factors of technology utilization are related developers can create products that consumers are more likely to use. Additionally, with this same information hotel managers can make more informed decisions on the GETs that are most useful to their specific clients. This in turn has the potential to lead to greater financial benefits. The following chapter will discuss the methodology used in this study.

## CHAPTER 3

### METHODOLOGY

#### Introduction

The purpose of this study is to determine and quantify the factors that impact hotel guests' intentions to seek and utilize guest empowerment technologies – a term also used to describe most hotel self-service technologies. This was accomplished through three objectives:

1. To determine if there are relationships between task characteristics, technology characteristics, and individual characteristics and the Task-Technology Fit (TTF) model
2. To determine if there are relationships between TTF and Perceived Ease of Use and between TTF and Perceived Usefulness
3. To determine if there are relationships between Perceived Ease of Use and Perceived Usefulness, and Intention to Use

The methodology used to determine the relationships is presented in the following sections. The first section discusses the sampling and data collection procedures. The second section discusses the development of the questionnaire. The third section examines the definitions of key terms and variables. The fourth section describes the statistical analysis technique that will be used.



### Sampling and Data Collection

Data was collected via an online survey between June 1, 2009 – June 5, 2009. Participants were randomly selected using a database provided by the Utah-based online research company Qualtrics, which was established in 1997. The company organizes, creates, administers, and analyzes surveys both for universities and the general business community. To recruit participants for this study Qualtrics utilized its database of nearly 4 million individuals within the United States who have already agreed to be contacted for survey participation as part of their membership with the organization. An email was sent to the potential participants in search of people who have utilized self-service technologies while staying in hotels in the last 12 months while traveling either for business or pleasure purposes. Qualified participants for the study were invited to take the survey via a link contained in the email. The use of an internet survey was chosen since this method has the ability to provide faster data collection than other methods and offers more geographic flexibility with relatively low costs.

### Questionnaire Development

The survey instrument was based on research conducted in previous studies. The survey questions (Appendix A) were designed to measure elements of the Task-Technology Fit (TTF) Model: Task Characteristics, Technology Characteristics, Individual Characteristics, and Fit. In addition, several of the questions were designed to measure factors related to the Technology Acceptance Model (TAM). Those factors are Perceived Ease of Use, Perceived Usefulness, and Intention to Use.

A questionnaire was used to measure the above constructs on eleven common hotel guest empowerment technologies found in the literature. These technologies are online hotel reservation systems, hotel check in/out kiosks, in-room check out systems, in-room video viewing of guest portfolio/charges, in-room movie on demand services, in-room video gaming on demand services, in-room mp3 player docking stations, in-room DVRs for recording/pausing live television, in-room internet access, in-room computers, and in-room fax machines. For classification purposes these technologies were categorized into three groups; reservation technologies, entertainment technologies, and communication technologies. The category of reservation technologies included online hotel reservation systems, hotel check in/out kiosks, in-room check out systems, and in-room video viewing of guest portfolio/charges. The category of entertainment technologies was comprised of in-room movie on-demand services, in-room video gaming on-demand services, in-room mp3 player docking stations, and in-room DVRs for recording/pausing live television. Finally, the category of communication technologies included the remaining technologies which are in-room internet access, in-room computers, and in-room fax machines. A set of similar questions for each category, differing only as needed for each specific technology (Appendix A), were developed using the Qualtrics survey software previously discussed.

For reservation and communication technologies thirty (30) questions were used to measure the four elements of the TTF model (i.e., task characteristics, technology characteristics, individual characteristics, and fit) while thirteen (13) questions were used to measure the three elements that are related to TAM (i.e., perceived ease of use, perceived usefulness, and intention to use). For the category of entertainment

technologies twenty-six (26) questions were used to measure the four elements of the TTF model while thirteen (13) questions were used to measure the three elements that are related to TAM. All items were measured on a 7 point Likert scale.

A pre-test was conducted to refine the survey tool. Undergraduate and graduate students majoring in hotel administration at the University of Nevada Las Vegas were asked to participate in the pre-test. The participants of the pre-test were asked to take the survey and provide feedback in order to determine that the questions were easily understood and addressed the intended items. Based on feedback from the pre-test participants the survey was modified in order to provide clarity for each question as needed.

### Definitions of Variables

Definitions of variables and the foundation for the development of the measurement scales for each are described in the following sub-sections. Previous research was utilized in order to aid in the development of the scales to measure the variables of the proposed research model. In addition, the development of some of the items was based on the current literature as related to self-service technology.

### *Measurement of Variables*

The following section describes the methods that were used to measure the variables utilized in the research model. Multiple items were utilized in order to attempt to predict the four constructs associated with the TTF model: task characteristics, technology characteristics, individual characteristics, and fit, as well as the three constructs of TAM: perceived ease of use, perceived usefulness, and intention to use.

### *Measurement of the Task-Technology Fit (TTF) constructs*

As previously mentioned the Task-Technology Fit model contains four constructs individual characteristics, technology characteristics, task characteristics, and fit. The following sub-sections will outline how this study measured these constructs.

#### *Measurement of Individual Characteristics*

The measurement of individual characteristics refers to the attributes inherent to each of the specific users. In order to determine these items research by Igbaria and Chakrabati (1990) was utilized. In their study Igbaria and Chakrabati developed a scale to measure users' computer literacy. This study adapted the concept of computer literacy developed by Igbaria and Chakrabati in order to apply it to commonly used modern technologies. The update scale used in this study measured users' experience with (a) social networking services, (b) instant messaging services, (c) voice over IP services, (d) general guest empowerment technologies, and (e) the specific guest empowerment technologies previously mentioned. The individual characteristics questions for each of the three previously mentioned GET categories (reservation technologies, entertainment technologies, and communication technologies) were identical with the exception of category type. Table 4 contains the scale items utilized to measure the individual characteristics.

*Table 4*

*Measurement of Individual Characteristics*

---

Statements for Individual Characteristics
<b>General Technologies</b>
How often do you use Social Networking Services (i.e. Facebook, MySpace, Twitter, etc.)?
How often do you use Instant Messaging Services (i.e. AOL Instant Messenger, Yahoo Messenger, ICQ, etc.)?
How often do you use Voice Over IP communication systems (i.e. Vonage, Skype, etc.)?
On a scale of 1-7 (1=no experience, 7=very experienced) how much experience do you have with using any type of Guest Empowerment Technology?
How many times have you used Guest Empowerment Technologies in the last 12 months?
During your last hotel stay how often did you use Guest Empowerment Technologies?
Do you have experience using any of the following Guest Empowerment Technologies? (check all that apply)

---

<b>Reservation Technologies</b>
On a scale of 1-7 (1=no experience, 7=very experienced) how would you rate you level of experience with these types of reservation systems?

---

<b>Entertainment Technologies</b>
On a scale of 1-7 (1=no experience, 7=very experienced) how would you rate you level of experience with these types of entrainment technologies?
<b>Statements for Individual Characteristics of Communication Technologies</b>
On a scale of 1-7 (1=no experience, 7=very experienced) how would you rate you level of experience with these types of communication technologies?

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### *Measurement of Technology Characteristics*

Beatson, Coote, and Rudd (2006) conducted research on the effects of self-service technology on customer satisfaction. In their research Beatson et al. developed eight constructs for measuring the characteristics of self-service technology: reliability, usability, ease to control, enjoyability, convenience, ability to save time, low risk, and customizability. This study asked participants to evaluate their experiences with the category of guest empowerment technology that they indicated they had used. The measurement of technology characteristics was on a seven point Likert scale for each of the eight constructs developed by Beatson et al.

### *Measurement of Task Characteristics*

This study utilized the items developed by Goodhue and Thomson (1995) in order to adapt the variables of task characteristics to the measurement scale. The research leading to the creation of the concept of task characteristics stems from studies conducted by Perrow (1967) and Thompson (1967). This work, later refined by Fry and Slocum (1984), led to a general categorization of tasks by their specific characteristics. This study utilized four items to measure the task characteristics for reservation technologies, three items to measure the task characteristics for entertainment technologies, and four items to measure the task characteristics for communication technologies as shown in Table 5. These items were modified from work conducted by Goodhue and Thomson (1995) in order to adapt them to use on hotel guest empowerment technologies.

*Table 5*

*Measurement of Task Characteristics*

Statements for Task Characteristics
Reservation Technologies
When I use hotel reservation systems I am able to complete my tasks without assistance from the hotel staff.
I am able to use hotel reservation systems in a way that meets my needs.
When I use hotel reservation systems I do not get the results I need as quickly as when I use other sources.
It is difficult for me to perform tasks effectively using hotel reservation systems because the functionality that I need is not available through them.
Entertainment Technologies
When I use hotel entertainment systems I am able to complete my tasks without assistance from the hotel staff.
The hotel entertainment systems that I have used are too inflexible to be able to respond to my needs.
It is difficult for me to perform tasks effectively using hotel reservation systems because the functionality that I need is not available through them.
Communication Technologies
When I use hotel communication systems I am able to complete my tasks without assistance from the hotel staff.
I am able to use hotel communication systems in a way that meets my needs.
When I use hotel communication systems I do not get the results I need as quickly as when I use other sources.
It is difficult for me to perform tasks effectively using hotel communication systems because the functionality that I need is not available through them.

### *Measurement of Fit*

According to Goodhue (1995), the majority of technology research does not evaluate true task-technology fit. This is because most technology surveys solicit responses from users regarding technology in a systematic methodical pattern of questioning for the system as a whole. Based upon Goodhue's research the measurement of fit will be utilized in this study in order to ascertain from users the level at which the specific technology fits their personal needs. To this end, fit was measured for each of the three technology categories on the ten items outlined by Goodhue (1995) as follows: (1) confusion, (2) level of detail, (3) meaning, (4) ability to be located, (5) accessibility, (6) assistance, (7) accuracy, (8) compatibility, (9) currency, and (10) presentation.

### *Measurement of the Technology Acceptance Model (TAM) constructs*

This study expanded upon the work of Davis, Bagozzi, and Warshaw (1989) (1989), Eriksson, and Nilsson (2007), Moon and Kim (2001), and Venkatesh and Davis (1996) in order to measure the constructs of TAM: perceived ease of use, perceived usefulness and intention to use. One of the foundations of TAM is that it deals with users' beliefs about technology. This is expressed through the constructs of Perceived Ease of Use and Perceived Usefulness. Specifically, perceived ease of use examines the user's beliefs that using and/or learning a new technology will be relatively effortless. For this study four items were used to measure perceived ease of use for each of the three technology categories. Five items were used to measure perceived usefulness, which is the user's belief that a new technology will improve the user's performance. Intention to use measures the level at which a user feels that they would utilize a specific technology.



This study measured the intention to use construct with four items adapted from Moon and Kim (2001). Table 6 shows the items used to measure each of the TAM constructs.

*Table 6*

*Measurement of TAM Characteristics*

Construct	Scale Item
Perceived Ease of Use	<p>Learning to operate hotel (reservation/entertainment/communication) technologies is easy for me.</p> <p>I find it easy to get hotel (reservation/entertainment/communication) technologies to do what I want it to do.</p> <p>It is easy for me to become skillful at using hotel (reservation/entertainment/communication) technologies.</p> <p>The more I use the hotel (reservation/entertainment/communication) technologies the easier it becomes.</p>
Perceived Usefulness	<p>Using hotel (reservation/entertainment/communication) technologies enhances my hotel experience.</p> <p>Using hotel (reservation/entertainment/communication) technologies increases my satisfaction.</p> <p>Using hotel (reservation/entertainment/communication) technologies enables me to accomplish tasks quicker.</p> <p>Using hotel (reservation/entertainment/communication) technologies offers me more convenience during my hotel stay.</p> <p>I find hotel (reservation/entertainment/communication) technologies to be useful during my hotel stay.</p>

Construct	Scale Item
Intention to Use	I intend to continue using hotel (reservation/entertainment/communication) technologies in the future.
	I expect hotels to continue to support the use of (reservation/entertainment/communication) technologies in the future.
	I expect more hotels to begin supporting the use of (reservation/entertainment/communication) technologies in the future.
	I will recommend others to use hotel (reservation/entertainment/communication) technologies.

### *Measurement of Demographics Variables*

The demographic variables examined in this study included gender, education, income level, age, ethnicity, and purpose of stay. Definitions of these variables are given in Table 7.

*Table 7*

### *Measurement of Demographic Variables*

Variable	Measurement
Gender	Male, female (nominal data)
Education	Indicated by indicating education level (ordinal data)
Income	Indicated by selecting household income range (ordinal data)
Age	Indicated in years by selecting the appropriate range (ordinal data)
Ethnicity	White, Black, Asian, Alaska native, Native Hawaiian, Pacific islander, Hispanic, Other (nominal data)
Location of Residence	Indicated by selecting state from list (nominal data)
Purpose of Stay	Business, Leisure, Both (nominal data)

### Data Analysis Method

The data collected from the surveys was formatted for use with SPSS 16.0 and the EQS 6.1 statistical software program. The data was pre-processed for consistency to eliminate incorrect sampling units and for completeness to check for non-responses. Once this was done, only completed cases were used. Some of the questions related to the task characteristics were worded negatively. These questions were R-TaC3 – “When I use hotel reservation systems I do not get the results I need as quickly as when I use other sources.”; R-TaC4 – “It is difficult for me to perform tasks effectively using hotel reservation systems because the functionality that I need is not available through them.”; E-TaC2 – “The hotel entertainment systems that I have used are too inflexible to be able to respond to my needs.”; E-TaC3 – “It is difficult for me to perform tasks effectively using hotel reservation systems because the functionality that I need is not available through them.”; C-TaC3 – “When I use hotel communication systems I do not get the results I need as quickly as when I use other sources.”; and C-TaC4 – “It is difficult for me to perform tasks effectively using hotel communication systems because the functionality that I need is not available through them.” These questions were reversely recoded in order to reflect the same scale direction as the positively worded questions. Descriptive statistics were then conducted for all questions to check for errors in data entry and missing data.

### *Reliability and Validity*

In order to test for reliability Cronbach’s alpha was utilized. All of the alpha values were found to be at an acceptable level of 0.6 or higher (Miller, 1995). A principal component factor analysis was conducted utilizing varimax rotation on each of

the scale items (Hair, Black, Anderson, & Tatham, 2006). A total of seven factors were found, four factors for the constructs of TTF and three factors for the constructs of TAM. This was in line with the number of proposed factors for this study.

### *Structural Equation Modeling (SEM)*

The EQS statistical software program was used to conduct Structural Equation Modeling (SEM) to exam the proposed model and test the proposed hypotheses of this study on the entire sample. Also, three additional subsamples (e.g. users of reservation technology, users of entertainment technology, and users of communication technology) were tested using SEM.

### Chapter Summary

Chapter 3 discussed the methodology used in this study including sampling procedures, data collection, and questionnaire development to test the proposed research model. Chapter 3 also provided definitions for the variables and descriptions of the data analysis techniques used in this study. The following chapter will provide an analysis of the results from the data collected.

## CHAPTER 4

### ANALYSIS AND RESULTS

#### Introduction

The purpose of this chapter is to explain the analysis of the data and present the results from this study. The analysis of the survey data is presented in five sections. The first provides an overview of the demographics and descriptive statistics as related to the participants of this study. The next section presents the results of the factor analysis conducted on the data and the third section addresses reliability testing through the use of Cronbach's Alpha. This is followed by the results of the Structural Equation Modeling (SEM) analysis on the data. Finally, this chapter presents the findings associated with the testing of the hypotheses and concludes with a brief chapter summary.

#### Data Analysis

##### *Response Rate*

Twenty-five thousand surveys were sent to potential participants. Of these, 1313 participants responded, giving an overall response rate of 5.3%. Of these participants 606 met the qualification requirements and completed the survey. This resulted in a usable response rate of 2.4%. The large variation between total respondents and completed surveys is partially due to the design of the online survey. The survey was divided into three categories of GET experience: reservation technology, entertainment technology,

and communication technology. Based upon answers to questions in the beginning of the survey participants would be asked a set of questions about one of the types of GETs. So the overall survey would not become too long, participants who qualified for multiple question sets were only asked one set of questions. Once the quota for one of the technology types was filled, survey participants had to indicate through their answers to the questions in the beginning of the survey any experience they had with one of the other two types of technologies in order to complete the final questions of the survey. While a participant may have indicated experience with the first type of technology that had already reached its quota if they did not indicate that they had experience with one of the remaining technologies they were terminated from the survey and not counted as having completed it. Once the second technology type quota was filled, the percentage of non-completions increased even further, because even participants who indicated that they had experience with the first two types of technology were unable to complete the survey if they did not indicate they had experience with the remaining open technology category.

In order to address the potential issue of non-response bias a comparison of early and late respondents was conducted. Those who had taken the survey within the first 24 hours of its launch were classified as early respondents while individuals who took the survey more than 24 hours after launch were classified as late respondents.

Approximately 70% of the surveys were taken by early respondents and 30% by late respondents. The ANOVA and factor analysis results showed no significant differences between the two groups.

### *Demographics*

The analysis of the demographic data of this survey indicates that the survey respondents were roughly evenly distributed in terms of gender with 52% male to 48% female. Approximately 55% of the respondents were 18-44 years old, while 45% were 45 or older. The educational level of the respondents indicated approximately 40% had a college degree or higher. The majority of the respondents were Caucasian. In terms of income, nearly 63% of respondents had an income of \$45,000 or greater. These figures are similar to the demographics of the general U.S. traveler population (U.S. Travel Market Overview, 2009). The sample demographics are given in Table 8.

Of the 606 respondents, 21.3% indicated that they had stayed in a hotel for at least one night for business purposes in the last 12 months. Additionally, of these 213 participants, 62.0% indicated that they had stayed in a hotel for business purposes for 1-2 nights. Of the total respondents 90.8% indicated that they had stayed in a hotel for at least one night for leisure purposes in the last 12 months. Further analysis showed that, the majority indicated that they had stayed in a hotel for leisure purposes for 1-2 nights. When asked about the purpose of their last hotel stay in which they used some form of guest empowerment technology over 75% indicated that their trip was for leisure. The majority of respondents used guest empowerment technologies in an economy hotel. Table 9 presents the descriptive statistics for the hotel stay characteristics reported by the participants.

*Table 8**Sample Demographics*

Variable	n	%
Gender		
Male	313	51.7
Female	290	47.9
Age		
18-24	55	9.1
25-34	113	18.6
35-44	149	24.6
45-54	168	27.7
55-64	97	16.0
65 and over	24	4.0
Education		
Some High School	9	1.5
High School Degree/G.E.D.	100	16.5
Trade/Technical School	39	6.4
Some College	218	36.0
College Degree	184	30.4
Graduate Degree	55	9.1



Variable	n	%
Ethnicity		
Caucasian / White	474	78.2
African American / Black	65	10.7
Asian	31	5.1
Hispanic / Latino	21	3.5
Native American / Alaska Native	7	1.2
Pacific Islander / Native Hawaiian	2	0.3
Other	6	1.0
Income		
Under \$15,000	30	5.0
\$15,000 - \$44,999	211	31.9
\$45,000 - \$74,999	193	34.8
\$75,000 - \$109,999	105	17.3
Greater than \$109,999	64	10.6
Geographic Area		
Northeast	86	14.2
Midwest	151	24.9
South	229	37.8
West	130	21.5
Outside the U.S.	10	1.7

*Table 9**Descriptive Statistics of Hotel Stay Characteristics*

Variable	n	%
Number of Hotel Nights in Last 12 Months for business		
1–2 nights	132	62.0
3–4 nights	39	18.3
5 or more nights	42	19.7
Number of Hotel Nights in Last 12 Months for leisure		
1-2 nights	302	54.9
3-4 nights	139	25.3
5 or more nights	106	19.7
Purpose of most recent trip using GET		
Business	84	13.9
Leisure	455	75.1
Both	56	9.2
Unsure	11	1.8
Type of hotel in which GET was used		
Economy	96	1.0
Mid-Range	388	64.8
Luxury	91	15.0
Other	6	1.0
Not Sure	25	4.1

The majority of respondents felt that they had at least a fair amount of experience with Guest Empowerment Technology as 70.5% ranked their experience level as 4 or higher on a seven point scale. The mean value of respondents experience with GET was 4.31. Table 10 details these figures.

*Table 10*

*Respondents Experience with Guest Empowerment Technologies*

Variable	n	%	Mean
1=no experience	50	8.4	
2	45	7.5	
3	77	12.9	
4	113	18.9	
5	154	25.8	
6	97	15.4	
7=experienced	62	10.4	
Total	598		4.31

An examination of the Guest Empowerment Reservations Technologies that were the focus of this study revealed that over 70% of respondents had used online reservation systems within the last 12 months, while just over 30% had used a hotel check in/out kiosk in the last 12 months. Analysis of the Guest Empowerment Entertainment Technologies showed that almost half of the respondents had used in-room movies on-demand services in the last 12 months, while only 16% who had used video gaming on-

*Table 11*

*Type of Guest Empowerment Technology Used*

Variable	n	% *
Reservations Technologies		
Online reservation systems	440	72.6
Hotel check in/out kiosks	192	31.7
In-room check out systems	252	41.6
In-room video viewing of guest portfolio/charges	182	30.0
Entertainment Technologies		
In-room movie on-demand services	302	49.8
In-room video gaming on-demand services	95	15.7
In-room mp3 docking stations	61	10.1
In-room DVR services for recording/pausing live television	88	14.5
Communication Technologies		
In-room internet services	505	83.3
In-room computers provided by the hotel	43	7.1
In-room fax machines provided by the hotel	6	1.0
Other Guest Empowerment Technologies	6	1.0

Note. \*greater than 100 percent as respondents were able to select multiple items.

demand services. Of the respondents who had used Guest Empowerment Communication Technologies in the last 12 months, nearly 75% had used in-room internet access. Only 1.0% of the respondents stated that they had used some other form of Guest Empowerment Technology in the last 12 months. Table 11 displays these figures.

### *Factor Analysis*

A factor analysis was used to check whether the questionnaire items loaded as expected onto the proposed hybrid model. A principal component factor analysis was conducted utilizing varimax rotation on each scale item (Hair, Black, Anderson, & Tatham, 2006). Due to cross-loading, three items (use of social networking services, use of instant messaging services, and use of voice mail services) were removed from the additional analysis. Additionally, two items (getting results quickly, and available functionality) had been reversely coded due to the negative wording of the question. However, factor analysis did not indicate that these two items were part of the expected factor based on the proposed model. This is most likely due to confusion from the wording of the question. These two items were therefore removed from further analysis. The results of the factor analysis are shown in Tables 12 - 17.

Table 12

*Guest Empowerment Reservation Technology TTF Factor Analysis*

Items	Factors			
	1	2	3	4
IC5: GET experience	.133	.201	.191	.442*
IC6: Used GET last 12 months	.106	.086	.127	.809*
IC7: Times used GET at hotel	-.022	-.052	-.034	.826*
R-IC1: Experience with reservation GET	-.087	-.085	-.014	.928*
R-TeC1: Reliability	.344	.767**	.290	-.019
R-TeC2: Usability	.319	.843**	.266	.015
R-TeC3: Control	.347	.845**	.187	-.001
R-TeC4: Enjoyable	.360	.811**	.144	.074
R-TeC5: Convenience	.391	.767**	.295	.000
R-TeC6: Time saving	.413	.764**	.255	.001
R-TeC7: Risk	.330	.788**	-.031	.082
R-TeC8: Customizable	.262	.787**	-.149	.031
R-TaC1: Complete task without assistance	.379	.453	.480 <sup>†</sup>	.062
R-TaC2: Meets my needs	.481	.384	.579 <sup>†</sup>	.035

Items	Factors			
	1	2	3	4
R-F1: Level of detail	.811 <sup>‡</sup>	.355	.244	.024
R-F2: Options	.819 <sup>‡</sup>	.317	.196	.050
R-F3 : Location	.826 <sup>‡</sup>	.342	.211	.063
R-F4: Access	.760 <sup>‡</sup>	.398	.234	-.017
R-F5: Get Assistance	.758 <sup>‡</sup>	.363	.065	.031
R-F6: Availability	.830 <sup>‡</sup>	.267	.149	.070
R-F7: Consistent	.827 <sup>‡</sup>	.351	.064	.044
R-F8: Accuracy	.084 <sup>‡</sup>	-.005	.637	.138
R-F9: Up-to-date	.835 <sup>‡</sup>	.233	.052	-.021
R-F10: Useful	.874 <sup>‡</sup>	.303	.058	.043

*Note.* <sup>‡</sup> Factor 1 = Fit; \*\* Factor 2 = Technology Characteristics;

<sup>†</sup>Factor 3 = Task Characteristics; \* Factor 4 = Individual Characteristics.

Table 13

*Guest Empowerment Reservation Technology TAM Factor Analysis*

Items	Factors		
	1	2	3
R-PEU1: Easy to learn	.289	.334	.797*
R-PEU2: Easy to do what I want	.269	.245	.790*
R-PEU3: Easy to become skilled at using	.285	.293	.835*
R-PEU4: Easier the more I use	.439	.581	.525*
R-PU1: Enhances experience	.893**	.208	.210
R-PU2: Increases satisfaction	.862**	.264	.247
R-PU3: Accomplish task quicker	.721**	.362	.449
R-PU4: Offers more convenience	.667**	.402	.415
R-PU5: Useful	.670**	.497	.365
R-IU1: Intend to continue to use	.421	.736 <sup>†</sup>	.421
R-IU2: Expect hotels to continue to support	.277	.870 <sup>†</sup>	.276
R-IU3: Expect to begin supporting	.244	.877 <sup>†</sup>	.278
R-IU4: Recommend others to use	.520	.570 <sup>†</sup>	.280

*Note.* \*\* Factor 1 = Perceived Usefulness; <sup>†</sup> Factor 2 = Intention to Use; \*

Factor 3 = Perceived Ease of Use.



*Table 14**Guest Empowerment Entertainment Technology TTF Factor Analysis*

Items	Factors			
	1	2	3	4
IC5: GET experience	.162	.232	.700*	.026
IC6: Used GET last 12 months	.031	.019	.787*	.065
IC7: Times used GET at hotel	.067	-.020	.780*	-.197
E-IC1: Experience with entertainment GET	-.089	-.089	.938*	.022
E-TeC1: Reliability	.863**	.278	.101	-.041
E-TeC2: Usability	.812**	.301	.074	.107
E-TeC3: Control	.833**	.310	.132	.062
E-TeC4: Enjoyable	.839**	.302	.072	.032
E-TeC5: Convenience	.827**	.309	.035	.005
E-TeC6: Time saving	.819**	.338	.077	-.050
E-TeC7: Risk	.710**	.282	.118	-.103
E-TeC8: Customizable	.634**	.306	-.029	-.219

Items	Factors			
	1	2	3	4
E-TaC1: Complete task without assistance	.453	.136	.182	.633 <sup>†</sup>
E-TaC2: Meets my needs	-.002	.318	-.167	.579 <sup>†</sup>
E-F1: Level of detail	.535	.675 <sup>‡</sup>	.076	-.077
E-F2: Options	.461	.739 <sup>‡</sup>	.046	-.039
E-F3 : Location	.328	.787 <sup>‡</sup>	.169	-.054
E-F4: Access	.436	.774 <sup>‡</sup>	.056	-.080
E-F5: Get Assistance	.416	.709 <sup>‡</sup>	-.069	-.122
E-F6: Availability	.428	.584 <sup>‡</sup>	.068	.135
E-F7: Consistent	.544	.681 <sup>‡</sup>	.034	.017

*Note.* \*\* Factor 1 = Technology Characteristics; <sup>‡</sup> Factor 2 = Fit;

\* Factor 3 = Individual Characteristics; <sup>†</sup> Factor 4 = Task Characteristics.

Table 15

*Guest Empowerment Entertainment Technology TAM Factor Analysis*

Items	Factors		
	1	2	3
E-PEU1: Easy to learn	.842*	.312	.247
E-PEU2: Easy to do what I want	.842*	.208	.316
E-PEU3: Easy to become skilled at using	.872*	.257	.293
E-PEU4: Easier the more I use	.725*	.371	.375
E-PU1: Enhances experience	.335	.397	.772**
E-PU2: Increases satisfaction	.322	.412	.780**
E-PU3: Accomplish task quicker	.356	.227	.761**
E-PU4: Offers more convenience	.485	.538	.566**
E-PU5: Useful	.484	.534	.544**
E-IU1: Intend to continue to use	.415	.772 <sup>†</sup>	.306
E-IU2: Expect hotels to continue to support	.289	.870 <sup>†</sup>	.230
E-IU3: Expect to begin supporting	.213	.831 <sup>†</sup>	.341
E-IU4: Recommend others to use	.236	.651 <sup>†</sup>	.505

*Note.* \* Factor 1 = Perceived Ease of Use; <sup>†</sup> Factor 2 = Intention to Use; \*\* Factor 3 = Perceived Usefulness.

Table 16

*Guest Empowerment Communications Technology TTF Factor Analysis*

Items	Factors			
	1	2	3	4
IC5: GET Experience	.174	.016	.855*	-.100
IC6: Used GET last 12 months	.100	.074	.743*	-.061
IC7: Time used GET at hotel	.073	.103	.698*	.140
C-IC1: Experience with Communication GET	-.090	-.088	.952*	.013
C-TeC1: Reliability	.733**	.389	.148	.121
C-TeC2: Usability	.856**	.294	.177	.079
C-TeC3: Control	.843**	.288	.108	.076
C-TeC4: Enjoyable	.788**	.383	.086	.208
C-TeC5: Convenience	.793**	.364	.055	.136
C-TeC6: Time saving	.786**	.283	.018	.164
C-TeC7: Risk	.775**	.385	.026	-.029
C-TeC8: Customizable	.733**	.331	-.034	-.089
C-TaC1: Complete task without assistance	.225	.288	.339	.460 <sup>†</sup>
C-TaC2: Meets my needs	.273	.228	.350	.596 <sup>†</sup>

Items	Factors			
	1	2	3	4
C-F1: Level of detail	.359	.777 <sup>‡</sup>	.145	.113
C-F2: Options	.389	.737 <sup>‡</sup>	.200	.019
C-F3 : Location	.358	.784 <sup>‡</sup>	.214	.150
C-F4: Access	.412	.770 <sup>‡</sup>	.185	.101
C-F5: Get Assistance	.451	.623 <sup>‡</sup>	.090	.227
C-F6: Availability	.426	.752 <sup>‡</sup>	.021	.053
C-F7: Consistent	.284	.863 <sup>‡</sup>	.068	.122
C-F8: Accuracy	.192	.835 <sup>‡</sup>	-.036	.107
C-F9: Up-to-date	-.088	.453 <sup>‡</sup>	-.082	.203
C-F10: Useful	.303	.824 <sup>‡</sup>	.015	.102

Note. \*\* Factor 1 = Technology Characteristics; <sup>‡</sup> Factor 2 = Fit;

\* Factor 3 = Individual Characteristics; <sup>†</sup> Factor 4 = Task Characteristics.

Table 17

*Guest Empowerment Communication Technology TAM Factor Analysis*

Items	Factors		
	1	2	3
C-PEU1: Easy to learn	.331	.385	.802*
C-PEU2: Easy to do what I want	.359	.309	.771*
C-PEU3: Easy to become skilled at using	.448	.286	.778*
C-PEU4: Easier the more I use	.591	.357	.545*
C-PU1: Enhances experience	.718**	.342	.432
C-PU2: Increases satisfaction	.748**	.386	.417
C-PU3: Accomplish task quicker	.697**	.421	.391
C-PU4: Offers more convenience	.682**	.537	.359
C-PU5: Useful	.761**	.409	.341
C-IU1: Intend to continue to use	.407	.758 <sup>†</sup>	.342
C-IU2: Expect hotels to continue to support	.378	.817 <sup>†</sup>	.260
C-IU3: Expect to begin supporting	.360	.792 <sup>†</sup>	.301
C-IU4: Recommend others to use	.271	.795 <sup>†</sup>	.308

*Note.* \*\* Factor 1 = Perceived Usefulness; <sup>†</sup> Factor 2 = Intention to Use;

\* Factor 3 = Perceived Ease of Use.

*Table 18**Analysis of Reliability for Guest Empowerment Reservation Technologies*

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
IC5: GET experience	4.10	1.68	0.77
IC6: Used GET last 12 months	3.65	1.93	
IC7: Time used GET at hotel	1.77	2.27	
R-IC1: Experience with reservation GET	4.76	1.56	
R-TeC1: Reliability	5.71	1.23	0.95
R-TeC2: Usability	5.69	1.22	
R-TeC3: Control	5.71	1.17	
R-TeC4: Enjoyable	5.58	1.24	
R-TeC5: Convenience	5.98	1.10	
R-TeC6: Time saving	6.01	1.11	
R-TeC7: Risk	5.42	1.35	
R-TeC8: Customizable	5.17	1.40	
R-TaC1: Complete task without assistance	5.80	1.23	0.77
R-TaC2: Meets my needs	5.84	1.16	
R-F1: Level of detail	5.58	1.20	0.92
R-F2: Options	5.61	1.17	
R-F3 : Location	5.70	1.17	
R-F4: Access	5.82	1.18	
R-F5: Get Assistance	5.50	1.30	
R-F6: Availability	5.71	1.25	
R-F7: Consistent	5.78	1.18	
R-F8: Accuracy	4.52	2.02	

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
R-F9: Up-to-date	5.96	1.19	
R-F10: Useful	5.95	1.04	
R-PEU1: Easy to learn	5.66	1.21	0.92
R-PEU2: Easy to do what I want	5.55	1.18	
R-PEU3: Easy to become skilled at using	5.64	1.16	
R-PEU4: Easier the more I use	5.94	1.09	
R-PU1: Enhances experience	5.49	1.34	0.95
R-PU2: Increases satisfaction	5.56	1.25	
R-PU3: Accomplish task quicker	5.76	1.20	
R-PU4: Offers more convenience	5.74	1.19	
R-PU5: Useful	5.75	1.19	
R-IU1: Intend to continue to use	6.06	1.18	0.93
R-IU2: Expect hotels to continue to support	6.18	1.11	
R-IU3: Expect to begin supporting	6.20	1.05	
R-IU4: Recommend others to use	6.00	1.20	



*Table 19**Analysis of Reliability for Guest Empowerment Entertainment Technologies*

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
IC5: GET Experience	4.62	1.70	0.76
IC6: Used GET last 12 months	4.58	1.30	
IC7: Time used GET at hotel	2.27	2.75	
E-IC1: Experience with Reservation GET	4.97	1.45	
E-TeC1: Reliability	5.58	1.22	0.94
E-TeC2: Usability	5.52	1.20	
E-TeC3: Control	5.56	1.22	
E-TeC4: Enjoyable	5.72	1.25	
E-TeC5: Convenience	5.86	1.23	
E-TeC6: Time saving	5.61	1.35	
E-TeC7: Risk	5.34	1.40	
E-TeC8: Customizable	4.84	1.49	
E-TaC1: Complete task without assistance	6.00	1.10	0.65
E-TaC2: Meets my needs	4.99	1.58	
E-F1: Level of detail	5.54	1.19	0.94
E-F2: Options	5.47	1.17	
E-F3 : Location	5.54	1.14	
E-F4: Access	5.54	1.32	
E-F5: Get Assistance	5.42	1.42	
E-F6: Availability	5.66	1.33	
E-F7: Consistent	5.67	1.25	

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
E-PEU1: Easy to learn	5.80	1.24	0.94
E-PEU2: Easy to do what I want	5.62	1.28	
E-PEU3: Easy to become skilled at using	5.71	1.23	
E-PEU4: Easier the more I use	6.08	1.13	
E-PU1: Enhances experience	5.89	1.10	0.94
E-PU2: Increases satisfaction	5.82	1.18	
E-PU3: Accomplish task quicker	5.69	1.26	
E-PU4: Offers more convenience	6.01	1.07	
E-PU5: Useful	5.98	1.13	
E-IU1: Intend to continue to use	6.22	1.14	0.92
E-IU2: Expect hotels to continue to support	6.29	1.01	
E-IU3: Expect to begin supporting	6.23	1.01	
E-IU4: Recommend others to use	6.11	1.20	

Table 20

*Analysis of Reliability for Guest Empowerment Communication Technologies*

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
IC5: GET experience	4.36	1.63	0.79
IC6: Used GET last 12 months	3.40	1.57	
IC7: Time used GET at hotel	1.78	1.51	
C-IC1: Experience with Reservation GET	4.93	1.37	
C-TeC1: Reliability	5.43	1.28	0.95
C-TeC2: Usability	5.61	1.26	
C-TeC3: Control	5.49	1.27	
C-TeC4: Enjoyable	5.66	1.19	
C-TeC5: Convenience	5.92	1.11	
C-TeC6: Time saving	5.79	1.18	
C-TeC7: Risk	5.28	1.30	
C-TeC8: Customizable	4.89	1.44	
C-TaC1: Complete task without assistance	5.92	1.14	0.72
C-TaC2: Meets my needs	5.92	1.09	
C-F1: Level of detail	5.46	1.22	0.93
C-F2: Options	5.45	1.18	
C-F3 : Location	5.49	1.18	
C-F4: Access	5.53	1.26	
C-F5: Get Assistance	5.38	1.22	
C-F6: Availability	5.59	1.31	
C-F7: Consistent	5.51	1.25	
C-F8: Accuracy	5.66	1.24	
C-F9: Up-to-date	4.47	1.99	
C-F10: Useful	5.69	1.17	

Items	Mean	Stand. Dev.	Cronbach's $\alpha$
C-PEU1: Easy to learn	5.84	1.11	0.93
C-PEU2: Easy to do what I want	5.71	1.15	
C-PEU3: Easy to become skilled at using	5.79	1.10	
C-PEU4: Easier the more I use	6.00	1.10	
C-PU1: Enhances experience	5.76	1.14	0.96
C-PU2: Increases satisfaction	5.90	1.05	
C-PU3: Accomplish task quicker	5.88	1.07	
C-PU4: Offers more convenience	6.00	1.03	
C-PU5: Useful	6.09	1.00	
C-IU1: Intend to continue to use	6.28	1.06	0.94
C-IU2: Expect hotels to continue to support	6.30	0.96	
C-IU3: Expect to begin supporting	6.34	0.90	
C-IU4: Recommend others to use	6.17	1.10	

### *Cronbach's Alpha*

Cronbach's alpha was used to test for reliability. All alpha values for were found to be at an acceptable level of 0.6 or higher (Miller, 1995). Tables 18 – 20 display the calculated alpha values along with the means and standard deviations for each variable.

### *Structural Equation Modeling (SEM)*

Structural Equation Modeling (SEM) was used to examine the proposed model. Previous research has found SEM to be a statistical technique that is superior to others when utilizing multiple dependent variables. Additionally, SEM is often utilized when testing the level at which a proposed model accurately accounts for the relationships that are observed in a sample (Kline, 2006). This analysis was conducted with the use of the EQS statistical software program. In order to test the hypotheses of this study the goodness-of-fit for the proposed model was examined. The general recommendation for Chi-square is  $p > 0.05$ , while the recommendation for comparative fit index (CFI) is  $> 0.90$ , and the root mean square error of approximation (RMSEA) should be  $< 0.10$ .

This study used SEM to test the proposed model on the entire sample. Also, three additional subsamples (e.g. users of reservation technology, users of entertainment technology, and users of communication technology) were tested using SEM.

### *Structural Model of the entire sample*

The hypothesized model contained seven factors; a) individual characteristics, b) technology characteristics, c) task characteristics, d) fit, e) perceived ease of use, f) perceived usefulness, and g) intention to use. The model fit the data reasonably well [ $\chi^2$  (11, N = 606) = 2282.81,  $p < 0.001$ , CFI = 0.89, RMSEA = 0.03]. The variances ( $R^2$ ) of the constructs were all significantly large with a range from 0.91 to 0.98.

Table 21 provides the path coefficients ( $\beta$ ) and corresponding significances. Additionally, Figure 5 of the proposed model with the path coefficients is provided to demonstrate each factor's level of impact on intention to use.

*Table 21*

*Influences on Fit, Perceived Ease of Use, Perceived Usefulness, and Intention to Use*

Item	Path Coefficient ( $\beta$ )
Fit	
Individual Characteristics	-0.01*
Technology Characteristics	0.54*
Task Characteristics	0.45*
Perceived Ease of Use	
Fit	0.96*
Perceived Usefulness	
Fit	0.95*
Intention to Use	
Perceived ease of use	0.44*
Perceived usefulness	0.57*

*Note.* \* $p < .05$ .

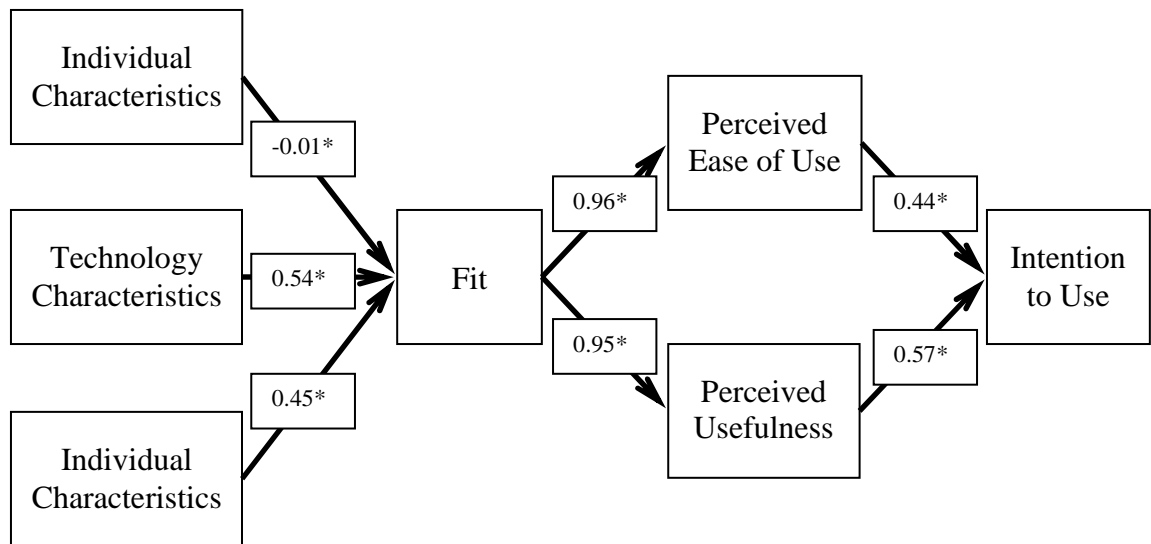


Figure 5. Proposed model with path coefficients.

Note. \* $p < .05$ .

#### *Relational Impact on Fit*

As can be seen in Table 21, Individual characteristics have a negative relationship with fit. This finding is contrary to the expected outcome. Therefore, based on this finding Hypothesis 3 must be rejected. Technology characteristics were found to have a positive relationship with fit, thus supporting Hypothesis 2. Similarly, Task characteristics had a positive relationship with fit, which supports Hypothesis 1. These results suggest that the more experience an individual has with GET, the less likely it is that the technology will fit their needs. This seemingly contradictory result may actually be an effect of the current design and/or implementation of existing GETs. Current GETs may not yet have reached their optimal point of utilization. As guests utilize these inefficient technologies they become frustrated with them and seek other options. The results also imply that as the features of the technology become more complex, the fit

improves. Additionally, fit tends to improve for GETs as the complexity of the task increases.

#### *Relational Impact on Perceived Ease of Use and Perceived Usefulness*

Based on the results of this survey fit has a positive relationship with perceived ease of use. This finding supports Hypothesis 4. The results also indicate that fit has a positive relationship with perceived usefulness, which supports Hypothesis 5. These findings suggest that as the fit increases, so does the user's belief that the GET is easy to use. The findings also imply that as the fit increases a user's belief that the GET will have more value to them increases.

#### *Relational Impact on Intention to Use*

The results of the study show that there is a positive relationship between perceived ease of use and intention to use, supporting Hypothesis 6. The findings also indicate that perceived usefulness has a positive relationship with intention to use, which supports Hypothesis 7. This potentially indicates that the more a person feels that a GET is easy to use the more likely they are to want to use it. Similarly, the findings suggest that the more a person believes that a GET will help them accomplish their goals the more likely they will be to want to use it.

#### *Structural Model of Guest Empowerment Reservation Technology*

An examination of the sample of individuals who had experience only with GETs classified as reservation technologies (i.e. online hotel reservation systems, hotel check in/out kiosks, in-room check out systems, or in-room video viewing of guest portfolio/charges) revealed that the model was a good fit for the data [ $\chi^2$  (11, N = 202) =



1879.77,  $p < 0.001$ , CFI = 0.92, RMSEA = 0.07]. The variances ( $R^2$ ) of the constructs were all significantly large, with a range from 0.95 to 0.98.

The path coefficients ( $\beta$ ) and corresponding significances are shown in Table 22. Additionally, Figure 6 containing the path coefficients is provided to demonstrate each factor's level of impact on intention to use.

*Table 22*

*Reservation Technology: Influences on Fit, Perceived Ease of Use, Perceived Usefulness, and Intention to Use*

Item	Path Coefficient ( $\beta$ )
Fit	
Individual Characteristics	0.00* <sup>†</sup>
Technology Characteristics	0.48*
Task Characteristics	0.51*
Perceived Ease of Use	
Fit	0.98*
Perceived Usefulness	
Fit	0.98*
Intention to Use	
Perceived ease of use	0.57*
Perceived usefulness	0.43*

Note. \* $p < .05$ ; <sup>†</sup> actual value 0.003.

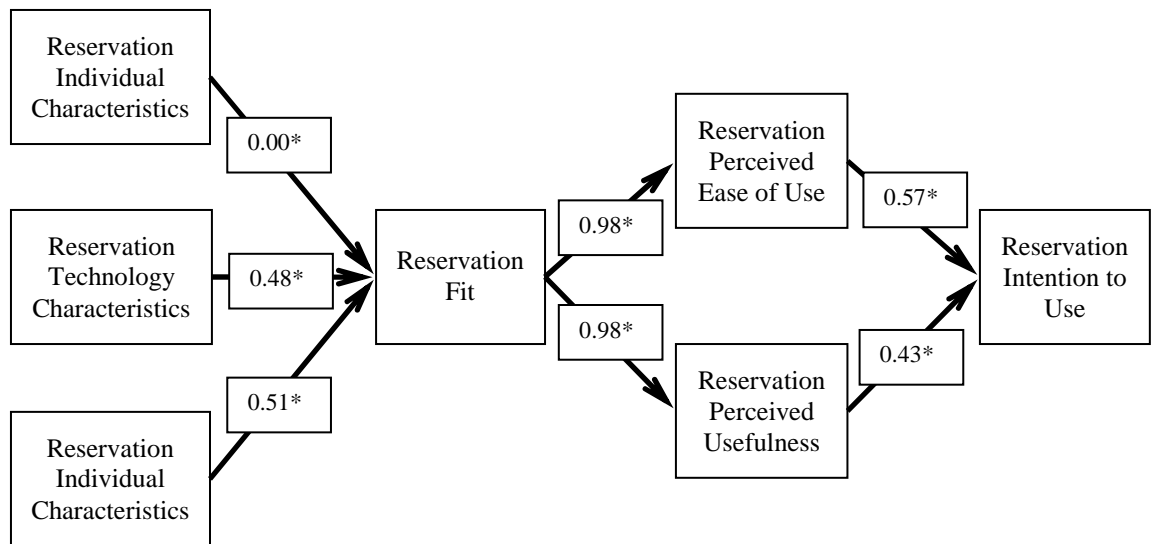


Figure 6. Model of reservation technology with path coefficients.

Note. \* $p < .05$ .

#### *Relational Impact on Fit*

As can be seen in Table 22, when examining only the reservation technologies, individual characteristics, technology characteristics, and task characteristics have significant positive relationships with fit. This indicates that the more an individual uses reservation technologies, the more complex the available features of a reservation technology are, and that the more complex a task is, the better the fit on the reservation technology will be. It should be noted that due to rounding the path coefficient value for individual characteristics in Table 22 is displayed as 0.00. The true value is slightly larger than the displayed value.

#### *Relational Impact on Fit, Perceived Ease of Use and Perceived Usefulness*

Based on the results of the analysis of reservation technologies fit has a significant positive relationship with perceived ease of use. There is a similarly significant positive relationship between fit and perceived usefulness. This demonstrates

that as fit increases, so does the user's belief that the reservation technology is easy to use. In addition a user's belief that the reservation technology will have more value to them also increases as fit increases.

#### *Relational Impact on Intention to Use*

The results of the reservation technologies analysis show a significant positive relationship between perceived ease of use and intention to use. In a similar manner, the findings indicate that perceived usefulness has a positive relationship with intention to use. This means that the more a person feels that the reservation technology is easy to use the more likely they are to want to use it. The findings also suggest that the more a person believes that a reservation technology will help them accomplish their goals the more likely they will be to want to use it.

#### *Structural Model of Guest Empowerment Entertainment Technology*

The analysis of the subsample of individuals who had experience only with GETs classified as entertainment technologies (i.e. in-room movie on-demand services, in-room video gaming on-demand services, in-room mp3 player docking stations, and in-room DVRs for recording/pausing live television) showed that the model was a good fit for the data [ $\chi^2$  (11, N = 202) = 1983.46,  $p < 0.001$ , CFI = 0.92, RMSEA = 0.08]. The variances ( $R^2$ ) of the constructs were all significantly large, with values from 0.96 to 0.99.

The path coefficients ( $\beta$ ) and corresponding significances are shown in Table 23. Additionally, Figure 7, containing the path coefficients, is provided to demonstrate the level of impact of each factor on intention to use.

Table 23

*Entertainment Technology: Influences on Fit, Perceived*

*Ease of Use, Perceived Usefulness, and Intention to Use*

Item	Path Coefficient ( $\beta$ )
Fit	
Individual Characteristics	-0.01*
Technology Characteristics	0.56*
Task Characteristics	0.44*
Perceived Ease of Use	
Fit	0.98*
Perceived Usefulness	
Fit	0.98*
Intention to Use	
Perceived ease of use	0.22*
Perceived usefulness	0.78*

*Note.* \* $p < .05$ .

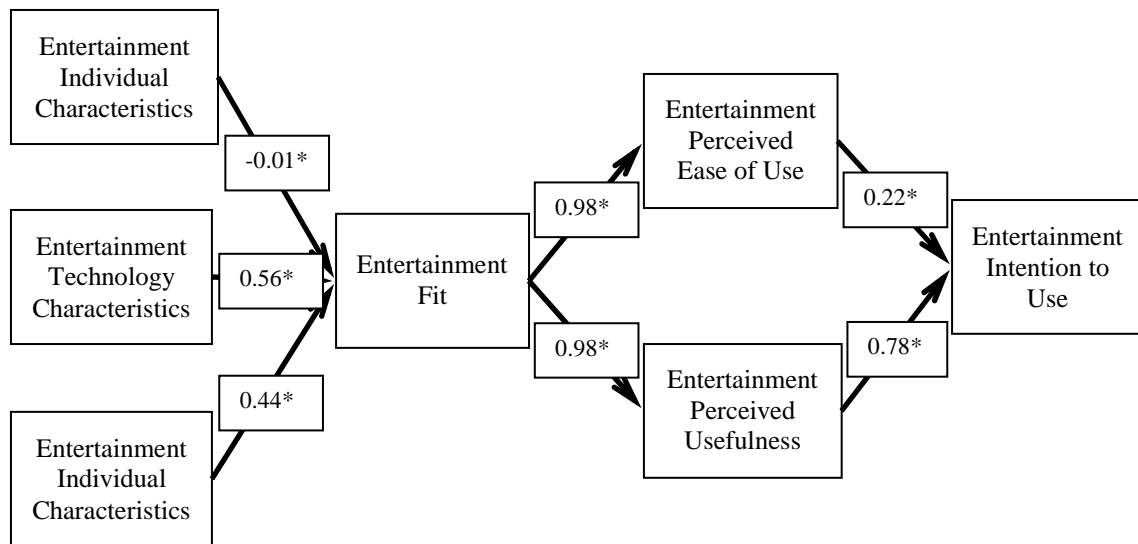


Figure 7. Model of entertainment technology with path coefficients.

Note. \* $p < .05$ .

#### *Relational Impact on Fit*

The analysis of the subsample of entertainment technologies (Table 23) showed that individual characteristics have a significant negative relationship with fit. This suggests, in a similar manner to that of the overall model of all types of GETs, that the more experience an individual has with an entertainment technology the less likely it will be to fit their needs. Additionally, technology characteristics and task characteristics have significant positive relationships with fit. This shows that the more complex the available features of an entertainment technology are and the more complex a task is, the better the fit on the entertainment technology will be.

#### *Relational Impact on Fit, Perceived Ease of Use and Perceived Usefulness*

The results of the analysis of entertainment technologies showed that fit has a significant positive relationship with perceived ease of use. The analysis also revealed that there is a significant positive relationship between fit and perceived usefulness. In

other words, as the fit increases, so does the user's belief that the entertainment technology is easy to use. Likewise, as the fit increases, a user's belief that the entertainment technology will have more value to them also increases.

#### *Relational Impact on Intention to Use*

According to the analysis of the entertainment technologies subsample there is a significant positive relationship between perceived ease of use and intention to use. In a similar manner, the findings indicate that perceived usefulness has a positive relationship with intention to use. This analysis indicates that the more a person believes that an entertainment technology is easy to use the more likely they will be to want to use it. In the same way, the more a person believes that an entertainment technology will help them accomplish their goals, the more likely they will be to want to use it.

#### *Structural Model of Guest Empowerment Communication Technology*

The analysis of the subsample of individuals who had experience only with GETs classified as communication technologies (i.e. in-room internet access, in-room computers provided by the hotel, and in-room fax machines provided by the hotel) showed that the model fit the data reasonably well [ $\chi^2$  (11, N = 202) = 3674.21,  $p < 0.001$ , CFI = 0.86, RMSEA = 0.11]. The variances ( $R^2$ ) of the constructs were all significantly large, ranging from 0.95 to 0.99.

The path coefficients ( $\beta$ ) and corresponding significances are shown in Table 24. Figure 8, containing the path coefficients, is provided to demonstrate the level of impact of each factor on intention to use.

Table 24

*Communication Technology: Influences on Fit, Perceived Ease of Use, Perceived Usefulness, and Intention to Use*

Item	Path Coefficient ( $\beta$ )
Fit	
Individual Characteristics	0.01*
Technology Characteristics	0.64*
Task Characteristics	0.33*
Perceived Ease of Use	
Fit	0.97*
Perceived Usefulness	
Fit	0.97*
Intention to Use	
Perceived ease of use	0.39*
Perceived usefulness	0.61*

*Note.* \* $p < .05$ .

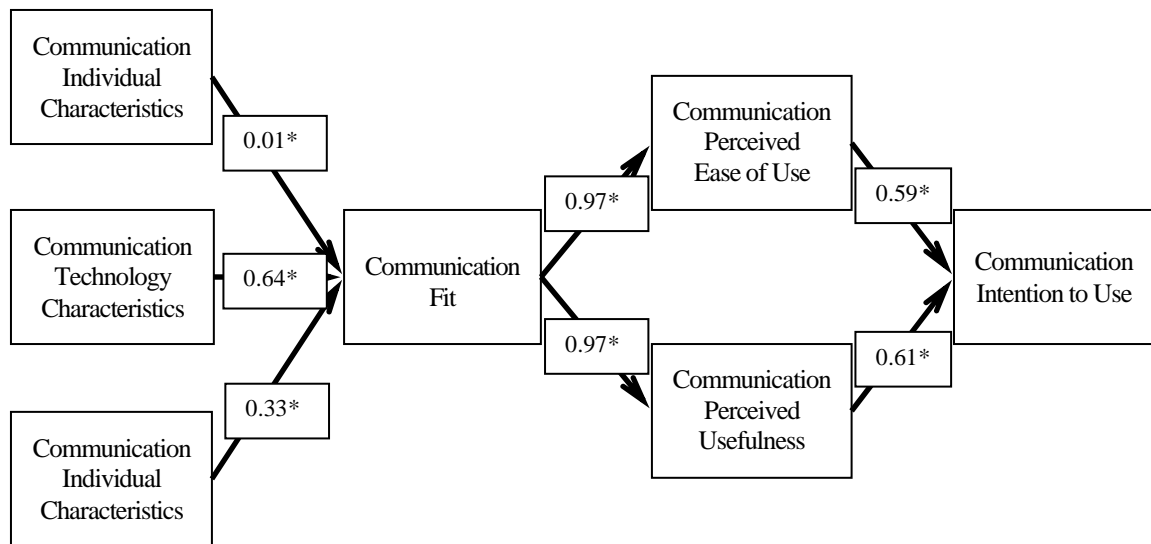


Figure 8. Model of communication technology with path coefficients.

Note. \* $p < .05$ .

#### *Relational Impact on Fit*

An examination of the communication technologies (Table 24) demonstrated that individual characteristics, technology characteristics, and task characteristics all have a significant positive relationship with fit. This indicates that the more experience an individual has with a communication technology, the more complex the available features of a communication technology are, and the more complex the task at hand, the better the fit with the communication technology will be.

#### *Relational Impact on Fit, Perceived Ease of Use and Perceived Usefulness*

The analysis of communication technologies demonstrated that fit has a significant positive relationship with perceived ease of use. The analysis also showed a significant positive relationship between fit and perceived usefulness. This means that as the fit increases, so does the user's feeling that the communication technology is easy to



use. The user's belief that the communication technology will have more value also increases as fit increases.

#### *Relational Impact on Intention to Use*

The results for the communication technologies subsample showed a significant positive relationship between perceived ease of use and intention to use. The findings also indicated that perceived usefulness has a positive relationship with intention to use. This shows that the more a person believes that a communication technology is easy to use, the more likely they will be to want to use it. In the same way, the more a person believes that a communication technology will help them accomplish their goals the more likely they will be to want to use it.

### Chapter Summary

In this chapter the proposed Guest Empowerment Technology Utilization Model was tested. The analysis revealed support for the proposed model. The next chapter will discuss the statistical results of the analysis in more detail. In addition to this, the theoretical and practical implications will be discussed. Finally, the limitations of this study will be examined and suggestions for future research will be offered.

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

#### Introduction

This chapter summarizes the major findings of this study. Additionally, the results of the statistical analysis will be discussed. In addition to this implications from a theoretical and practical perspective will be discussed in this chapter. This chapter will conclude with an examination of the limitations of this study and suggestions for future research.

#### Discussion of Findings

This study provides important contributions to both academics and hospitality practitioners. Research based on models and theories related to technology utilization and acceptance has been conducted and applied to various settings for decades (Ajzen & Fishbein, 1980; Davis, 1989; Goodhue & Thompson, 1995; Dabholkar, 1996; Dishaw & Strong, 1999; Green & Skinner, 2005). However, there has yet to be developed a single theory or model able to directly address aspects of technology utilization in the hospitality self-service environment. Specifically, limited research has been conducted that utilized a hybrid Task Technology Fit-Technology Acceptance Model in the hospitality industry. The proposed model represents an important advancement in the theoretical research regarding technology utilization and acceptance, particularly with

respect to self-service environments such as guest empowerment technologies. This study addressed four research questions. First, what are the factors that affect guest usage of hotel Guest Empowerment Technologies? Second, what are the relationships between the factors of the Task Technology Fit Model as applied to GETs? Third, what are the relationships between the factors of the Technology Acceptance Model as applied to GETs? Finally, is there a correlation between the factors of the Task Technology Fit Model and the Technology Acceptance Model as applied to GETs?

This study examined the relationships among factors of the theoretical hybrid task technology fit-technology acceptance model. Its focus was on the differences in the impact of the determinants of the principle components of the theoretical model (the task technology fit model and the technology acceptance model) as well as the determinants of the theoretical model as it applied to the specific groups of technologies examined in the survey (reservation, entertainment, and communication guest empowerment technologies). The findings of this study and their implications are discussed in the following section.

#### *Entire Theoretical Model*

This study utilized a hybrid model which is a combination of the Task Technology Fit model (Goodhue & Thompson, 1995) and the Technology Acceptance Model (Davis, 1986). Goodhue and Thompson (1995) theorized that task technology fit (TTF) is the “degree to which a technology assists an individual in performing their portfolio of tasks.” TTF is used to measure the match between a user’s requirements for a specific task, the user’s abilities and the functionality of a technology. It has been found that TTF is greater when the functionality of a technology and the user’s

requirements are similar. TTF has also been found to be lower if the functionality of the technology is less adequate in meeting the needs of the user or when the demands of a task are increased (Goodhue & Thompson, 1995). Individuals have a greater tendency to utilize technology if the capabilities of the technology fit the needs of the individual. Therefore, TTF can be a good predictor of technology utilization.

The completion of a specific task is directly tied to an individual's performance (Goodhue & Thompson, 1995). A higher level of individual performance can suggest improved effectiveness and efficiency. This in turn can result in higher quality output. A high TTF increases both the chances that a technology will be utilized and the user's performance. It has been proposed by Goodhue and Thompson that a high TTF leads to an increase in user performance because the technology has a tendency to have more of a direct fit with the needs of the user.

In order to ensure that the measurements are accurate, these TTF evaluations must be associated with the characteristics of the technology being evaluated. Similarly, the evaluation of ease of use in TTF must be associated with the user's performance (Goodhue, 1995).

The theoretical underpinnings of TTF are based in multiple areas of research. These areas are structural contingency theory (Drazin & Van de Ven, 1985), behavior decision theory (Edwards, 1962), and work adjustment theory (Dawis, et al., 1968). Additionally, TTF incorporates factors similar to theories of information technology (IT) users' behaviors and attitudes such as the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), the Theory of Planned Behavior (TPB) (Ajzen, 1991)

When examining the methods in which the Technology Acceptance Model (TAM) (Davis, 1986) and TTF are similar, it is interesting to note that like TTF, TAM is related to TRA and TPB. TAM was developed by Davis (1986) as an extension of TRA and TPB in order to explain technology users' behavior. The principal constructs of TAM are technology ease of use (EU) and perceived usefulness (PU). In creating TAM Davis hypothesized the primary determinant of technology usage to be the user's behavior intentions to use a technology. It has been found that users' attitudes toward technology and the PU of a particular technology determine behavioral intentions (Garrity, et al., 2005).

The research of Dishaw and Strong (1999) shows how TAM differs from the theories on which it was based. Unlike models before it TAM does not include subjective norms as one of its constructs in determining actual technology usage. Research has also found the framework of TAM for directly utilizing behavior intentions as a means of predicting utilization to be sound, as other factors that may contribute to behavior do so only indirectly (Davis, et al., 1989).

The creation of a hybrid TAM/TTF model is logical as both individual models examine various portions of technology acceptance which will eventually lead to an accept or reject decision by the user. As previously discussed TAM developed by Davis (1993) and the TTF model developed by Goodhue (1995) have similar attributes.

In the Davis (1993) Technology Acceptance Model the construct of external factors is used to account for a wide range of variables that may have indirect influence on system usage. Unlike TAM, Task-Technology Fit (Goodhue, 1995) examines specific constructs which lead to user's technology utilization intention. Thus, a theoretical

hybrid model can easily be created by substituting the specific TTF constructs of Task, Technology, and Individual characteristics for the construct of External Factors in TAM.

An examination of the theoretical model with the entire sample revealed that task characteristics and technology characteristics were good predictors of fit. On the other hand, it was also found that individual characteristics were not a good predictor of fit. This finding is unique, as previous studies (Goodhue, et al., 1995; Goodhue, 1998; Agarwal, et al., 1999) found individual characteristics to be good predictors of fit. The difference in the findings of this study is most likely related to its examination of guest empowerment technologies. It is possible that the most GETs currently available to hotel guests are not yet capable of creating a consistent experience for users. This is largely in part due to a common and sometime serious problem with designing products to meet the manufacture's needs and not the end user's needs (Capodagli & Jackson, 1999). Due to these inconsistencies users may have to relearn how to utilize similar types of GETs depending on the location (hotel property) at which they are used. Research has shown that the type of technology available to an individual has an effect on the level of usage (Mathieson & Keil, 1998). It is therefore possible that an experience with one type of GET at a specific hotel may not be comparable to an experience with the same type of GET at a different hotel. From a practical standpoint, this finding demonstrates the importance of consistency among user's experiences with GETs.

Additionally, previous research has focused on the ways in which social factors such as social norms and peer influence affect technology utilization (Goodhue & Thompson, 1995). As such an individual's concerns about specific technologies may be underestimated in the literature. In other words, individuals may use certain technologies

in public settings because they feel that it is socially acceptable or that they are required to do so. However, in a private setting, such as a hotel room, the same individuals may opt to use an alternate technology or nothing at all. This is because in the privacy of a hotel room the social pressure to utilize a specific technology is not present.

Multi-unit hotel owners should make use of these findings when considering installing new GETs or upgrading existing ones. If an individual guest has a good experience with a specific GET at a hotel, they will be more likely to use want to use it at another location (Agarwal & Prasad, 1997). If the way in which the GET operates is the same across all units, then the individual will not need to relearn how to use the technology. Thus, this will potentially increase the guest's satisfaction (Beatson, et al., 2006). If the GET is tied to a revenue generating function a high level of consistency will have the additional effect of increasing overall profits for the property.

This study also found fit to be a good determinate of perceived ease of use and perceived usefulness having a positive relationship with both factors. In other words, if the GET is designed to properly meet the needs of the user and the requirements of the task, the user will believe that the technology can benefit them (Davis, 1993) and will not be difficult to use (Davis, 1989). In addition, both perceived ease of use and perceived usefulness were found to have significant positive relationships with intention to use. These findings suggest that in order to encourage guests to utilize GETs, hoteliers must demonstrate the benefits that guests will receive from the new technologies. However, the guest must also believe that they will actually receive the benefits that the hotelier claims (Stockdale, 2006).

### *Guest Empowerment Reservation Technology Model*

Based on previous research the results should indicate that there is a positive relationship between all of the factors in the model (Goodhue, et al., 1995; Goodhue, 1998; Agarwal, et al., 1999). The findings of the subsample of reservation technology were exactly as expected from the research for the findings of the overall model. This is noteworthy because the results of the actual findings of the overall model were not entirely identical to those of previous research. The subsample of reservation technology is of importance as these technologies are vital for a hotel's operations and potential marketing (Heung, 2003). It was found that more participants had experience with the individual components of this type of technology than with those of the other technology groups. Since hotel guests appear to have a greater amount of experience with these types of technologies, it would be beneficial for hotel owners to focus their efforts on methods to capture the marketing and revenue generating potential of these technologies (Murphy, Forrest, Wotring, & Brymer, 1996).

Additionally, because hotel guests tend to utilize reservation technologies comparatively often (Morrison, Jing, O'Leary, & Cai, 2001) it is more likely that guests will have at least a general knowledge of how to use these technologies and the features inherent to them. Therefore, hotel owners can spend fewer resources in attempts to demonstrate the benefits of reservation technologies to guests than they would spend promoting other types of guest empowerment technologies.

### *Guest Empowerment Entertainment Technology Model*

The relational results for the entertainment technologies were similar to that of the findings of the overall model. Individual characteristics had a negative relationship with



fit while the other factors had a positive relationship with their determinants. This suggests that the more experience an individual has with entertainment technologies the less likely it is that a specific technology will fit their needs. This is most likely due in part to the wide variety of personalized entertainment options available (Holjevac, 2003). These technologies provide varying experiences. However, based on their functionality the same type of entertainment technologies can provide different experiences. For this reason, experience with one type of entertainment technology may not prepare a user for an experience with another type of technology.

It is also of interest to note that during the data collection phase the quota for entertainment technologies took the longest to meet. In fact the quotas for the other technology group filled much earlier than that of the entertainment technologies group. This suggests that individuals have less experience with entertainment technologies compared to the other types of technology. Hotel owners should be particularly interested in this finding, as many entertainment technologies are sources of revenue (Chance, Hillenbrand, & Hilliard, 2008). Hotel owners may be losing potential revenue to other technology options. The results of this study suggest that it would be beneficial for owners to better inform hotel guests of the potential benefits of these entertainment technologies.

#### *Guest Empowerment Communication Technology Model*

The analysis of the communication technology group showed that all of the factors had a positive relationship with all of their determinates. This is similar to the results of previous research (Goodhue, et al., 1995; Goodhue, 1998; Agarwal, et al., 1999). An interesting finding with regard to this technology group is that one of the

technologies that make up this factor had by far the most participants who indicated that they had used it. That technology was in-room internet services. Hoteliers should take note of that as in-room internet services have the potential to be a large source of revenue as well as an amply utilized guest service (Siguaw, Enz, & Namasivayam, 2000). Intelligent use of start pages and web portals can also make in-room internet services a form of marketing for hotel services (Dabholkar, 1994).

### Limitations and Future Research

One of the unique limitations of this research is intimately related to the very reason to doing this study. The technology industry is a rapidly evolving field in which products and services are constantly changing. Computer software, for example, has a tendency to become obsolete within a relatively short period of time. While the findings of this study of this study are current as of the date of publication, they may not be in a few years. It would therefore be wise to replicate this study in the future. Doing so would provide valuable information on guest empowerment technology at the time the study would be conducted. This study could also serve as the basis for a comparison of hotel GET attitudes and trends over time.

Another limitation of this study is the distinct economical, political, and historical context in which it has been conducted. Data was collected was during a major downturn in the U.S. and global economies. Many consumers are experiencing financial difficulty. As such it is highly likely that consumers spending patterns have been affected. As a result, many individuals who would normally travel have chosen not to do so. Likewise, many of those who do travel have less disposable income and have opted

not to purchase services they would previously have purchased. Due to the hotel industry's dependence on disposable income, it is possible a similar study were conducted in a more positive economic climate would produce different results.

The method of data collection is another limitation. The survey was distributed via an online environment. As such the individuals who participated in the study needed to have at least some basic computer skills. It is entirely possible that a paper survey would have different results.

Additionally, an unanticipated consequence of the method used to collect data is a limitation. Based on their responses to questions in the beginning of the survey, participants were asked a set of questions about one of the GET types later on in the survey. Once the quota for one of the technology types was filled participants had to indicate that they had experience with one of the other remaining types of technologies in order to qualify for the second part of the survey. This situation was compounded when all but one of the remaining technology groups had been filled. Thus, it was possible that potential participants who had experience with GET were not allowed to complete the survey due to a group being filled.

An additional limitation comes from the nature of the self-response survey. By allowing respondents to complete the survey on their own a small amount of control was lost in that there was no way to clarify any uncertainty that the respondents may have regarding the questions. As with any survey that asks respondents to recall past events, respondents' inability to accurately recall their experiences is a potential issue. There is the additional possibility of a minor social desirability bias. Despite the anonymity of the survey, some respondents may have provided answers which were not entirely accurate

due to an uneasiness to admit to purchasing certain types of services or other factors having to do with the social desirability of undesirability of various technologies.

Another limitation of this study is that the majority of the sample lived within the United States. If this study were conducted with a sample from a different country the results as well as the findings could vary greatly.

The exclusion of some of the variables in the analysis due to issues of factor loading is another limitation. The questions used to create the survey for this study were based on previous research and adapted to the guest empowerment technology environment. Every effort was made to maintain the essence of each question including conducting a pilot test. However responses of some of the participants suggest that some of the items were not completely without flaw. Further research could be conducted to determine the exact structure of the items on the survey to allow for the understanding of the items by the broadest sample possible. Once this was done it would be worthwhile to conduct this survey using the redeveloped scale.

Limitations also exist as a result of the demographics of the sample. The majority of the respondents were leisure travelers (75.1%). Therefore, it is fair to assume that the results of the analysis maybe skewed toward the traits and preferences of leisure travelers. Additionally, the majority of business travelers (62.0%) and leisure travelers (54.9%) had stayed in a hotel for only 1-2 nights in the last 12 months. This suggests that a large group of respondents may not have spent a great deal of time using guest empowerment technologies. Also, the majority of the respondents indicated that the last time that they used GETs was in a mid-range hotel (64.8%) while other types of hotels were considerably less well represented. Future research should develop methods to

obtain a sample that is more evenly distributed among business and leisure travel and that includes travelers who have stayed in a wide range of hotel types for extended periods. Data collected this way could then be better analyzed based on a comparison of traveler and hotel types.

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## APPENDIX A

### SURVEY INSTRUMENT

## Introduction

---

**Hello and thank you for coming to this site to participate in this study. This study is being conducted by researchers at the University of Nevada, Las Vegas on the topic of hotel technology applications. The following statements are for documentation purposes and must be agreed to before continuing with this study.**

### Purpose of the Study

You are invited to participate in a research study. The purpose of the study is to explore how people use hotel technology.

### Participants

You are being asked to participate in this study because you are a person at least 18 years of age and who has stayed in a hotel in the last 12 months.

### Procedures

If you volunteer to participate in this study, you will be asked to do the following: Give approximately 20 minutes of your time to answer some basic questions about your opinions and experiences with hotel technology.

### Benefits of Participation

There *may not* be direct benefits to you as a participant in this study. However, we hope to learn about hotel technology usage which will allow for more effective deployment of such technologies thanks to your contribution. When a hotel deploys technology based on research results, the research will help to maximize customers' satisfaction. Therefore, you may indirectly receive benefits in the future from the appropriate applications of technology in a hotel.

### Risks of Participation

There are risks involved in all research studies. This study include only minimal risks. You may become uncomfortable when answering some questions such as those asking for demographic information.

### Cost / Compensation

There will not be financial costs to you to participate in this study. The study will take approximately 20 minutes of your time.

### Voluntary Participation

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to e-mail questions about this study at the beginning or any time during the research study.

### Confidentiality

All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for at least 3 years after the completion of the study. After the storage time, the information gathered will be destroyed.

### Contact Information

If you have any questions or concerns about the study, you may contact Dr. Pearl Brewer at (702) 895-3643. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office for the Protection of Research Subjects at (702) 895-2794.

### Participant Consent:

By clicking on the "I AGREE" button below you agree to have read the above information and agree to participate in this study. You also agree that you are at least 18 years of age.

---

I AGREE

☐

☐ I do not agree to participate

### Screening

Have you stayed in a hotel for at least one night in the last 12 months?

☐

Yes

☐

No

Have you used any type of hotel related self-service technology during a hotel stay in the last 12 months?

Some common examples of hotel related self-service technologies include but are not limited to:

- Online hotel reservation systems
- Hotel check in/out kiosks
- In-room video viewing of guest charges
- In-room movies and video gaming on demand
- In-room mp3 player docking stations
- In-room Internet access

☐

Yes

☐

No

What is your current age?

### Demographics

The following questions are for classification purposes only. No identifying information will be able to be linked to any specific individual.

What is your gender?

☐

Male

☐

Female

Please select the highest level of education you have completed.

☐ Some High School

☐ High School Degree/G.E.D.

☐ Trade/Technical School

☐ Some College

☐ College Degree

☐ Graduate Degree

Please select the range of your average household yearly income.

☐ Under \$15,000

☐ \$75,000 - \$89,999

☐ \$15,000 - \$29,999

☐ \$90,000 - \$109,999

☐ \$30,000 - \$44,999

☐ \$110,000 - \$124,999

☐ \$45,000 - \$59,999

☐ \$125,000 - \$149,999

☐ \$60,000 - \$74,999

☐ Greater than 149,999

Do you consider yourself:

☐ Caucasian / White

☐ African American / Black

☐ Asian

☐ Hispanic / Latino

☐ Native American / Alaska Native

☐ Pacific Islander / Native Hawaiian

☐ Other

Where is your primary residence located?

Please indicate how many of the following types of trips in which you stayed at a hotel you have taken in the last 12 months.

Business

Pleasure

#SurveyEngine, Total#

What was the purpose of your most recent trip in which you used any type of hotel self-service technologies (i.e. In-room entertainment systems, Online hotel reservation systems, In-room check out systems, In-room Internet access, etc.)?

☐ Business

☐ Pleasure

☐ Both

What type of hotel did you stay at on your most recent trip in which you used any type of hotel self-service technologies (i.e. In-room entertainment systems, Online hotel reservation systems, In-room check out systems, In-room Internet access, etc.)?

☐ Economy

☐ Mid-Range

☐ Luxury

☐ Other

☐ Not sure

### Individual Characteristics - General Tech experience

How often do you use Social Networking Services (i.e. Facebook, MySpace, Twitter, etc.)?

☐ Daily

☐ Once a Month

☐ 2-3 Times a Week

☐ Less than Once a Month

☐ Once a Week

☐ Never

☐ 2-3 Times a Month

How often do you use Instant Messaging Services (i.e. AOL Instant Messenger, Yahoo Messenger, ICQ, etc.)?



- |   |  |
|---|--|
| <input type="radio"/> Daily             | <input type="radio"/> Once a Month           |
| <input type="radio"/> 2-3 Times a Week  | <input type="radio"/> Less than Once a Month |
| <input type="radio"/> Once a Week       | <input type="radio"/> Never                  |
| <input type="radio"/> 2-3 Times a Month |  |

How often do you use Voice Over IP communication systems (i.e. Vonage, Skype, etc.)?

- |   |  |
|---|--|
| <input type="radio"/> Daily             | <input type="radio"/> Once a Month           |
| <input type="radio"/> 2-3 Times a Week  | <input type="radio"/> Less than Once a Month |
| <input type="radio"/> Once a Week       | <input type="radio"/> Never                  |
| <input type="radio"/> 2-3 Times a Month |  |

### Individual Characteristics - GET experience

For the following questions the term Guest Empowerment Technologies refers to electronic systems that allow hotel guests to have more personal control over their stay in a hotel as well as systems that provide more convenience for guests without direct intervention from hotel staff.

Some common examples of Guest Empowerment Technologies include: Online hotel reservation systems, Hotel check in/out kiosks, In-room check out systems, In-room video viewing of charges, In-room movies on demand, In-room video gaming on-demand, In-room mp3 player docking stations, In-room DVRs for recording/pausing live television, In-room Internet access, In-room computers, and In-room fax machines.

On a scale of 1 - 7 (1=no experience, 7= very experienced) how much experience do you have with using any type of Guest Empowerment Technology?

1 = no experience	2	3	4	5	6	7 = very experienced
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How many total times have you used Guest Empowerment Technologies in the last 12 months?

During your last hotel stay how often did you use Guest Empowerment Technologies?

### Individual Characteristics - Specific GETs

As previously described, the term Guest Empowerment Technologies refers to electronic systems that allow hotel guests to have more personal control over their stay in a hotel as well as systems that provide more convenience for guests without direct intervention from hotel staff.

Do you have experience using any of the following Guest Empowerment Technologies? (check all that apply)

<input type="checkbox"/> Online hotel reservation systems	<input type="checkbox"/> In-room DVRs for recording/pausing live television
<input type="checkbox"/> Hotel check in/out kiosks	<input type="checkbox"/> In-room Internet access
<input type="checkbox"/> In-room check out systems	<input type="checkbox"/> In-room computers provided by the hotel
<input type="checkbox"/> In-room video viewing of guest portfolio/charges	<input type="checkbox"/> In-room fax machines
<input type="checkbox"/> In-room movie on-demand services	<input type="checkbox"/> Other Guest Empowerment Technologies (please specify) <input type="text"/>
<input type="checkbox"/> In-room video gaming on-demand services	<input type="checkbox"/> None of these technologies
<input type="checkbox"/> In-room mp3 player docking stations	

The availability of which of the following Guest Empowerment Technologies would have a positive influence on your likelihood to stay at a hotel. (check all that apply)

<input type="checkbox"/> Online hotel reservation systems	<input type="checkbox"/> In-room mp3 player docking stations
<input type="checkbox"/> Hotel check in/out kiosks	<input type="checkbox"/> In-room DVRs for recording/pausing live television
<input type="checkbox"/> In-room check out systems	<input type="checkbox"/> In-room Internet access
<input type="checkbox"/> In-room video viewing of guest portfolio/charges	<input type="checkbox"/> In-room computers provided by the hotel
<input type="checkbox"/> In-room movie on-demand services	<input type="checkbox"/> In-room fax machines
<input type="checkbox"/> In-room video gaming on-demand services	<input type="checkbox"/> Other Guest Empowerment Technologies (please specify) <input type="text"/>

### Reservation Technologies

Based on your answers to the previous questions you have indicated that you have had experience with types of Guest Empowerment Technologies that are often referred to as Reservation Technologies. These types of technologies include Online hotel reservations systems, Hotel check in/out kiosks, In-room check out systems, and In-room video viewing of guest portfolio/charges.

On a scale of 1 - 7 (1=no experience, 7=very experienced) how would you rate your level of experience with these types of reservation systems?

1 = no experience	2	3	4	5	6	7 = very experienced
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During your most recent hotel stay in which you used Guest Empowerment **Reservation Technologies**, please rate the performance of the technologies on the following attributes: (1 = poor, 7 = excellent).

	1 = poor	2	3	4	5	6	7 = excellent
Reliability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An enjoyable experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time saving ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customizable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

As previously mentioned examples of common Guest Empowerment Reservation Technologies are Online hotel reservations systems, Hotel check in/out kiosks, In-room check out systems, and In-room video viewing of guest portfolio/charges.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree).

When I use hotel reservation technologies I am able to complete my tasks without assistance from the hotel staff.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am able to use hotel reservation technologies in a way that meets my needs.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When I use hotel reservation technologies I do not get the results I need as quickly as when I use other sources.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is difficult for me to perform tasks effectively using hotel reservation technologies because the functionality that I need is not available through them.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

As a reminder, as previously mentioned examples of common Guest Empowerment Reservation Technologies are Online hotel reservations systems, Hotel check in/out kiosks, In-room check out systems, and In-room video viewing of guest portfolio/charges.

Based on your most recent hotel stay in which you used Guest Empowerment **Reservation Technologies** please rate your level of agreement with the following statements about the technologies: (1 = strongly disagree, 7 = strongly agree).

	1 = strongly disagree	2	3	4	5	6	7 = strongly agree	N/A
The available options had the appropriate level of detail for my use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The definitions of the options available were easy to find.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were easy to find when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were easy to 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"/>
It was easy to get assistance using the technologies when I needed it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were "up" and available when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I obtained was consistent with other sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There were accuracy problems with the information I obtained.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I obtained was up-to-date enough for my needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I obtained was in a useful format.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Reservation Technologies are Online hotel reservations systems, Hotel check in/out kiosks, In-room check out systems, and In-room video viewing of guest portfolio/charges.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

Learning to operate hotel reservation technologies is easy for me.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I find it easy to get hotel reservation technologies to do what I want them to do.

1 = strongly

disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is easy for me to become skillful at using hotel reservation technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The more I use hotel reservation technologies the easier it becomes.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel reservation technologies enhances my hotel experience.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel reservation technologies increases my satisfaction.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel reservation technologies enables me to accomplish tasks quicker.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel reservation technologies offers me more convenience during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I find hotel reservation technologies to be useful during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Reservation Technologies are Online hotel reservations systems, Hotel check in/out kiosks, In-room check out systems, and In-room video viewing of guest portfolio/charges.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

I intend to continue using hotel reservation technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I expect hotels to continue to support the use of hotel reservation technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I expect more hotels to begin supporting the use of reservation empowerment technologies in the future.

1 = strongly disagree	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will recommend others to use hotel reservation technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Entertainment Technologies

Based on your answers to the previous questions you have indicated that you have had experience with types of Guest Empowerment Technologies that are often referred to as Entertainment Technologies. These types of technologies include In-room movie on-demand systems, In-room video gaming on-demand systems, In-room mp3 player docking stations, and In-room DVRs for recording/pausing live television.

On a scale of 1 - 7 (1=no experience, 7=very experienced) how would you rate your level of experience with these types of entertainment technologies?

1 = no experience	2	3	4	5	6	7 = very experienced
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During your most recent hotel stay in which you used Guest Empowerment **Entertainment Technologies**, please rate the performance of the technologies on the following attributes: (1 = poor, 7 = excellent)

	1 = poor	2	3	4	5	6	7 = excellent
Reliability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An enjoyable experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time saving ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customizable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

As previously mentioned examples of common Guest Empowerment Entertainment Technologies are In-room movie on-demand systems, In-room video gaming on-demand systems, In-room mp3 player docking stations, and In-room DVRs for recording/pausing live television.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

When I use hotel entertainment technologies I am able to complete my tasks without assistance from the hotel staff.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The hotel entertainment technologies that I have used are too inflexible to be able to respond to my needs.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is difficult for me to perform tasks effectively using hotel entertainment technologies because the functionality that I need is not available through them.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

As previously mentioned examples of common Guest Empowerment Entertainment Technologies are In-room movie on-demand systems, In-room video gaming on-demand systems, In-room mp3 player docking stations, and In-room DVRs for recording/pausing live television.



Based on your most recent hotel stay in which you used Guest Empowerment **Entertainment Technologies** please rate your level of agreement with the following statements about the technologies: (1 = strongly disagree, 7 = strongly agree)

	1 = strongly disagree	2	3	4	5	6	7 = strongly agree	N/A
The available options had the appropriate level of detail for my use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The definitions of the options available were easy to find.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were easy to find when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were easy to 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"/>
It was easy to get assistance using the technologies when I needed it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were "up" and available when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functionality of the technology was consistent with other sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Entertainment Technologies are In-room movie on-demand systems, In-room video gaming on-demand systems, In-room mp3 player docking stations, and In-room DVRs for recording/pausing live television.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

Learning to operate hotel entertainment technologies is easy for me.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I find it easy to get hotel entertainment technologies to do what I want them to do.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is easy for me to become skillful at using hotel entertainment technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The more I use hotel entertainment technologies the easier it becomes.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Using hotel entertainment technologies enhances my hotel experience.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel entertainment technologies increases my satisfaction.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel entertainment technologies enables me to accomplish tasks quicker.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel entertainment technologies offers me more convenience during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I find hotel entertainment technologies to be useful during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Entertainment Technologies are In-room movie on-demand systems, In-room video gaming on-demand systems, In-room mp3 player docking stations, and In-room DVRs for recording/pausing live television.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

I intend to continue using hotel entertainment technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I expect hotels to continue to support the use of hotel entertainment technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I expect more hotels to begin supporting the use of hotel entertainment technologies in the future.

1 = strongly disagree	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will recommend others to use hotel entertainment technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Communications Technologies

Based on your answers to the previous questions you have indicated that you have had experience with types of Guest Empowerment Technologies that are often referred to as Communication Technologies. These types of technologies include In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

On a scale of 1 - 7 (1=no experience, 7=very experienced) how would you rate your level of experience with these types of communication technologies?

1 = no experience	2	3	4	5	6	7 = very experienced
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During your most recent hotel stay in which you used Guest Empowerment **Communication Technologies**, please rate the performance of the technologies on the following attributes: (1 = poor, 7 = excellent). As previously mentioned examples of common Guest Empowerment Communication Technologies are In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

	1 = poor	2	3	4	5	6	7 = excellent
Reliability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An enjoyable experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time saving ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Low risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customizable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

As previously mentioned examples of common Guest Empowerment Communication Technologies are In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

When I use hotel communication technologies I am able to complete my tasks without assistance from the hotel staff.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am able to use hotel communication technologies in a way that meets my needs.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When I use hotel communication technologies I do not get the results I need as quickly as when I use other sources.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is difficult for me to perform tasks effectively using hotel communication technologies because the functionality that I need is not available through them.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Based on your most recent hotel stay in which you used Guest Empowerment **Communication Technologies** please rate your level of agreement with the following statements about the technologies: (1 = strongly disagree, 7 = strongly agree). As previously mentioned examples of common Guest Empowerment Communication Technologies are In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

	1 = strongly disagree	2	3	4	5	6	7 = strongly agree	N/A
The available options had the appropriate level of detail for my use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The definitions of the options available were easy to find.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The technologies were easy to find when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were easy to 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"/>
It was easy to get assistance using the technologies when I needed it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technologies were "up" and available when I needed them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The functionality of the technology was consistent with other sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I obtained was in a useful format.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There were accuracy problems with the output I obtained.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I obtained was up-to-date enough for my needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Communication Technologies are In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

Learning to operate hotel communication technologies is easy for me.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I find it easy to get hotel communication technologies to do what I want them to do.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is easy for me to become skillful at using hotel communication technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The more I use hotel guest communication technologies the easier it becomes.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using hotel communication technologies enhances my hotel experience.

1 = strongly	2	3	4	5	6	7 = strongly agree
--------------	---	---	---	---	---	--------------------

disagree

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Using hotel communication technologies increases my satisfaction.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Using hotel communication technologies enables me to accomplish tasks quicker.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Using hotel communication technologies offers me more convenience during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I find hotel communication technologies to be useful during my hotel stay.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

For your reference for the following questions as previously mentioned examples of common Guest Empowerment Communication Technologies are In-room Internet access, In-room computers provided by hotels, and In-room fax machines.

For the following questions please rate your answers on a scale of 1 - 7 (1=strongly disagree, 7=strongly agree):

I intend to continue using hotel communication technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I expect hotels to continue to support the use of hotel communication technologies in the future.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
-----------------------	---	---	---	---	---	--------------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

I expect more hotels to begin supporting the use of hotel communication technologies in the future.

1 = strongly disagree	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will recommend others to use hotel communication technologies.

1 = strongly disagree	2	3	4	5	6	7 = strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Value

You are almost finished. For these final questions we would like to know how much value you place on the ability to use each of the following Guest Empowerment Technologies.

If you were staying at a hotel that had an **online reservation system** what is the maximum amount you would be willing to pay to use this technology?

<input type="radio"/> nothing / free	<input type="radio"/> \$10.00 - \$14.99 per each use
<input type="radio"/> \$0.01 - \$0.99 per each use	<input type="radio"/> \$15.00 - \$19.99 per each use
<input type="radio"/> \$1.00 - \$4.99 per each use	<input type="radio"/> \$20.00 - \$24.99 per each use
<input type="radio"/> \$5.00 - \$9.99 per each use	<input type="radio"/> More than \$24.99 per each use

If you were staying at a hotel that had a **check in/out kiosk** what is the maximum amount you would be willing to pay to use this technology?

<input type="radio"/> nothing / free	<input type="radio"/> \$10.00 - \$14.99 per each use
<input type="radio"/> \$0.01 - \$0.99 per each use	<input type="radio"/> \$15.00 - \$19.99 per each use
<input type="radio"/> \$1.00 - \$4.99 per each use	<input type="radio"/> \$20.00 - \$24.99 per each use
<input type="radio"/> \$5.00 - \$9.99 per each use	<input type="radio"/> More than \$24.99 per each use

If you were staying at a hotel that had an **in-room check out system** what is the maximum amount you would be willing to pay to use this technology?

<input type="radio"/> nothing / free	<input type="radio"/> \$10.00 - \$14.99 per each use
<input type="radio"/> \$0.01 - \$0.99 per each use	<input type="radio"/> \$15.00 - \$19.99 per each use
<input type="radio"/> \$1.00 - \$4.99 per each use	<input type="radio"/> \$20.00 - \$24.99 per each use

- ☐ \$5.00 - \$9.99 per each use ☐ More than \$24.99 per each use

If you were staying at a hotel that had an **in-room video viewing of guest portfolio/charges system** what is the maximum amount you would be willing to pay to use this technology?

- ☐ nothing / free ☐ \$10.00 - \$14.99 per each use
- ☐ \$0.01 - \$0.99 per each use ☐ \$15.00 - \$19.99 per each use
- ☐ \$1.00 - \$4.99 per each use ☐ \$20.00 - \$24.99 per each use
- ☐ \$5.00 - \$9.99 per each use ☐ More than \$24.99 per each use

If you were staying at a hotel that had **in-room movie on-demand services** what is the maximum amount you would be willing to pay to use this technology?

- ☐ nothing / free ☐ \$10.00 - \$14.99 per each use
- ☐ \$0.01 - \$0.99 per each use ☐ \$15.00 - \$19.99 per each use
- ☐ \$1.00 - \$4.99 per each use ☐ \$20.00 - \$24.99 per each use
- ☐ \$5.00 - \$9.99 per each use ☐ More than \$24.99 per each use

If you were staying at a hotel that had **in-room video gaming on-demand services** what is the maximum amount you would be willing to pay to use this technology?

- ☐ nothing / free ☐ \$10.00 - \$14.99 per each use
- ☐ \$0.01 - \$0.99 per each use ☐ \$15.00 - \$19.99 per each use
- ☐ \$1.00 - \$4.99 per each use ☐ \$20.00 - \$24.99 per each use
- ☐ \$5.00 - \$9.99 per each use ☐ More than \$24.99 per each use

If you were staying at a hotel that had an **in-room mp3 player docking station** what is the maximum amount you would be willing to pay to use this technology?

- ☐ nothing / free ☐ \$10.00 - \$14.99 per hotel night
- ☐ \$0.01 - \$0.99 per hotel night ☐ \$15.00 - \$19.99 per hotel night
- ☐ \$1.00 - \$4.99 per hotel night ☐ \$20.00 - \$24.99 per hotel night
- ☐ \$5.00 - \$9.99 per hotel night ☐ More than \$24.99 per hotel night

If you were staying at a hotel that had an **in-room DVR for recording/pausing live television** what is the maximum amount you would be willing to pay to use this technology?

- ☐ nothing / free ☐ \$10.00 - \$14.99 per hotel night

- |   |   |
|---|---|
| <input type="radio"/> \$0.01 - \$0.99 per hotel night | <input type="radio"/> \$15.00 - \$19.99 per hotel night |
| <input type="radio"/> \$1.00 - \$4.99 per hotel night | <input type="radio"/> \$20.00 - \$24.99 per hotel night |
| <input type="radio"/> \$5.00 - \$9.99 per hotel night | <input type="radio"/> More than \$24.99 per hotel night |

If you were staying at a hotel that had **in-room Internet access** what is the maximum amount you would be willing to pay to use this technology?

- |   |   |
|---|---|
| <input type="radio"/> nothing / free                  | <input type="radio"/> \$10.00 - \$14.99 per hotel night |
| <input type="radio"/> \$0.01 - \$0.99 per hotel night | <input type="radio"/> \$15.00 - \$19.99 per hotel night |
| <input type="radio"/> \$1.00 - \$4.99 per hotel night | <input type="radio"/> \$20.00 - \$24.99 per hotel night |
| <input type="radio"/> \$5.00 - \$9.99 per hotel night | <input type="radio"/> More than \$24.99 per hotel night |

If you were staying at a hotel that had an **in-room computer provided by the hotel** what is the maximum amount you would be willing to pay to use this technology?

- |   |   |
|---|---|
| <input type="radio"/> nothing / free                  | <input type="radio"/> \$10.00 - \$14.99 per hotel night |
| <input type="radio"/> \$0.01 - \$0.99 per hotel night | <input type="radio"/> \$15.00 - \$19.99 per hotel night |
| <input type="radio"/> \$1.00 - \$4.99 per hotel night | <input type="radio"/> \$20.00 - \$24.99 per hotel night |
| <input type="radio"/> \$5.00 - \$9.99 per hotel night | <input type="radio"/> More than \$24.99 per hotel night |

If you were staying at a hotel that had an **in-room fax machine** what is the maximum amount you would be willing to pay to use the technology?

- |  |  |
|--|--|
| <input type="radio"/> nothing / free               | <input type="radio"/> \$10.00 - \$14.99 per each use |
| <input type="radio"/> \$0.01 - \$0.99 per each use | <input type="radio"/> \$15.00 - \$19.99 per each use |
| <input type="radio"/> \$1.00 - \$4.99 per each use | <input type="radio"/> \$20.00 - \$24.99 per each use |
| <input type="radio"/> \$5.00 - \$9.99 per each use | <input type="radio"/> More than \$24.99 per each use |



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Degrees:

Bachelor of Science, Restaurant, Hotel, Institutional and Tourism Mgt, 1999  
Purdue University, West Lafayette, Indiana

Master of Business Administration, 2004  
Ball State University, Muncie, Indiana

Special Honors and Awards:

Journal of Hospitality Marketing and Management, Reviewer (2009)  
I-CHRIE Conference, Reviewer (2009)  
Americas Conference on Information Systems, Reviewer (2009)  
Hospitality Information Technology Association, Secretary (2009)  
UNLV Graduate Access Grant (2008, 2009)  
Certified Hospitality Educator (2008)  
Graduate Student Conference in Hospitality and Tourism, IT Coordinator (2008)  
Marie Barbara Woodrich Scholarship (2008)  
Southern Wines & Spirits Endowment (2008)  
Graduate Student Conference in Hospitality and Tourism, Reviewer (2008)  
AH&LA Research Funding (2007)  
State of Nevada Department of Health and Human Services Grant (2006)

Journal Publications:

Erdem, M., Schrier, T., & Brewer, P. (2009). Guest Empowerment Technologies:  
Tools That Give Hotel Guests Personal Control Over Their Stay in a Hotel. *The  
Bottomline* 24(3), 17-19.

Government Publications:

Bernhard, B., Harper, A., Schrier, T., Thomas, N., LaBrie, R., LaPlante, D., Peller, A., & Shaffer, H., (2007). An Assessment of a Brief Problem Gambling Intervention in Nevada. Prepared for the State of Nevada Department of Health and Human Services.

Industry Reports:

Brewer, K., Kim, J., Schrier, T., & Farrish, J. Current and Future Technology of the Hotel Industry. Prepared for the American Hotel & Lodging Association, May, 2008.

Referred Conference Proceedings:

Schrier, T., Erdem, M., & Brewer, K. Guest Empowerment Technologies: Evaluating the Acceptance and Fit for Hotel Guests. Presented at *The 14th Annual Graduate Student Research Conference in Hospitality and Tourism*, Las Vegas, Nevada, January, 2009.

Kim, E., Schrier, T., & Mattila, A. The Perceived Credibility of Positive and Negative WOM vs. eWOM. Presented at *The 14th Annual Graduate Student Research Conference in Hospitality and Tourism*, Las Vegas, Nevada, January, 2009.

Kim, J., Farrish, J., Schrier, T., & Brewer, K. Where Hoteliers Are and Where They are Heading: Self-service, Wireless, Green, and Security Technologies. Presented at *The 14th Annual Graduate Student Research Conference in Hospitality and Tourism*, Las Vegas, Nevada, January, 2009.

Schrier, T., Kim, J., Farrish, J., & Brewer, K. Hoteliers' Expectations and Utilization of Technology. Presented at *The Hospitality Information Technology Association Annual Conference*, Austin, Texas, June 2008.

Schrier, T., Kim, J., & Brewer, K. Factors That Influence Hotel Mangers' Acceptance Level of Wi-Fi. Presented at *The 13th Annual Graduate Education and Student Research Conference in Hospitality & Tourism*, Orlando, Florida, January, 2008.

Zheng, T., Schrier, T. & Millar, M. An Analysis of Online Customer Complaints in Multiple Sectors of the Hotel Industry. Presented at *The 13th Annual Graduate Education and Student Research Conference in Hospitality & Tourism*, Orlando, Florida, January, 2008.

Millar, M., Schrier, T., & Kim, E. WiFi Availability and Accessibility as Stated on Hotel Websites. Presented at *The 2007 Las Vegas International Hospitality and Convention Summit*, Las Vegas, Nevada, June 2007.

Kim, E., & Schrier, T. A Content Analysis of Hotel Customer's Post-Purchase Online Evaluations. Presented at *The 2007 Las Vegas International Hospitality and Convention Summit*, Las Vegas, Nevada, June 2007.

Schrier, T., Thomas, N., & Harper, A. Problem Gambling Outcomes Research in Nevada. Presented at *The 1st Annual State of Nevada Conference on Problem Gambling*, Las Vegas, Nevada, April, 2007.

Schrier, T., Millar, M., & Kim, E. Wireless Internet Trends in the Hotel Industry. Presented at *The 12th Annual Graduate Education and Student Research Conference in Hospitality & Tourism*, Houston, Texas, January, 2007.

Kim, E., & Schrier, T. eWOM: What Motivates Consumers to Write Hotel Reviews on the Internet? Presented at *The 12th Annual Graduate Education and Student Research Conference in Hospitality & Tourism*, Houston, Texas, January, 2007.

Book Chapters:

Woods, R. H. et al. (2006) Managing Hospitality Human Resources, 4th ed. Job Analysis and Job Design Chapter. Lansing, Mich.: Educational Institution of the American Hotel & Lodging Association.

Invited Presentations:

Schrier, T. Technology Applications in the Convention and Events Industry. Presented at *The International School of Hospitality Seminar on Conferences and Events Management*, Las Vegas, Nevada, November, 2007.

Dissertation Title: The Utilization of a Hybrid Task Technology Fit-Technology Acceptance Model for the Evaluation of Hotel Guest Empowerment Technologies Usage

Dissertation Examination Committee:

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Committee Member, Dr. Bo Bernhard, Ph.D.  
Committee Member, Dr. Mehmet Erdem, Ph. D.  
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