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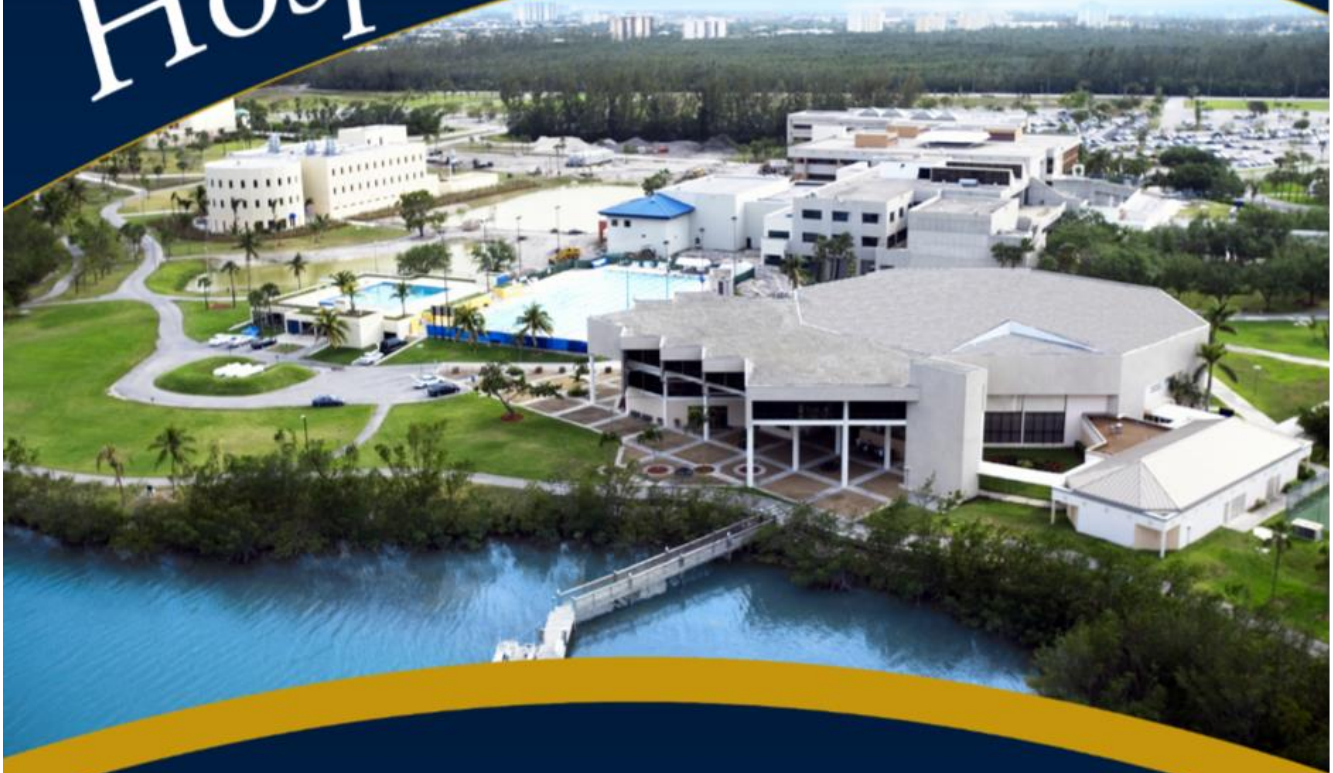
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Forward and Call to Action by:
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Forward and Call To Action

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The hospitality industry has undergone radical transformations in the past three decades. Since the 1980s, technological advancements have been transforming the hospitality industry. Global Distribution Systems (GDS), Computer Reservation Systems (CRS), developments on the Web, advanced Customer Relationship Management (CRM) software and many other advances have changed the way hospitality companies conduct business. Their implications for research have also been tremendous. We can see a clear pattern that in recent year that hospitality research has improved in terms of methodology and statistical procedures. Earlier empirical research studies mainly included descriptive statistics. However in the past years we can observe that more sophisticated methods are being used such as SEM and PLS with the help of software such as LISREL, AMOS, and MPlus. Most of current research in the hospitality is empirical and they tend to deploy primary field surveys in a variety of areas such as marketing, consumer behavior, food science, accounting, finance, human resources, information technology, strategic management, entrepreneurship, pricing, psychology to name a few. Hospitality researchers are now investigating a range of phenomenon, using diverse data and methods, producing new forms of scholarly output, and engaging in innovative new forms of research and publication. This call to action specifically focuses at the progress in information technology research in hospitality literature.

Uncovering ever changing needs of contemporary traveler needs and trends is important for hospitality research. We, as researchers need to explore the unknown and unseen and utilize creative and innovative research approaches. Contemporary travelers are always connected. Hotel bookings from the Internet and mobile devices are on the rise. They use more devices across a common set of platforms to help decision making process, purchase, WOM behaviors and so on. Marketing research shows that the amount of time people spend on a mobile device is growing rapidly, at 14 times the rate of desktop usage. Mobile is becoming a more prominent channel for commercial transactions. Social media usage is still growing, presenting a great potential for both practitioners and academia. Hashtags also open up new opportunities. Research studies indicate that photos make up half of news feed stories in social media. Therefore, visual interactions with branded content on social media will create research opportunities.

Call to Action:

1. Conduct research studies to investigate the differences among e-commerce of products vs. services.
2. Work on continual study of online customer experiences by adopting theories from multidisciplinary perspectives.
3. Collaborate with researchers in other fields.
4. Carry on research that combines a theoretical foundation with research questions that have value both to the industry and to the body of knowledge.
5. Focus on emerging areas such as
   a. e-commerce and market intelligence
   b. Recommender systems
   c. Social media monitoring
   d. Social and virtual games
   e. Gamification
   f. Impact of customer generated content

Research Note: Biometric Technology Applications and Trends in Hotels

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Abstract

The purpose of this study is to investigate the biometrics technologies adopted by hotels and the perception of hotel managers toward biometric technology applications. A descriptive, cross sectional survey was developed based on extensive review of literature and expert opinions. The population for this survey was property level executive managers in the U.S. hotels. Members of American Hotel and Lodging Association (AHLA) were selected as the target population for this study. The most frequent use of biometric technology is by hotel employees in the form of fingerprint scanning. Cost still seems to be one of the major barriers to adoption of biometric technology applications. The findings of this study showed that there definitely is a future in using biometric technology applications in hotels in the future, however, according to hoteliers; neither guests nor hoteliers are ready for it fully.

Keywords: biometrics, hotel, security, technology, guest, privacy

Introduction

Use of recent technological applications can help hotel companies in many areas including marketing, operations, guest services, human resources, information technology and security areas (Crick & Spencer, 2011; Davidson, McPhail, & Barry, 2011; Harrington & Ottenbacher, 2011; Ip, Leung, & Law, 2011; Yoo, Lee, & Bai, 2011). It is even claimed that successful deployment of technological applications can help hotel companies create and maintain a competitive advantage (Bilgihan, Okumus, Nusair, & Kwun, 2011; Okumus, 2013). Currently, biometric technology is one of the novel technologies that can help hotel companies in many areas. For example, biometric technology is now replacing conventional identifications and verification methods in many areas in the business world.

Biometric refers to the use of automated methods to identify a person based on physiological or biological characteristics. Signature verification, fingerprint recognition, iris

scanning, hand geometry, vein patterns, voice recognition, and facial recognition are major methods used in biometrics. Biometric technology is a highly effective way to establish identity verification. Therefore, it has emerged as a promising technology for authentication and has already found its' place in the most hi-tech security areas (Bilgihan, Beldona, & Cobanoglu, 2009; Berezina, Cobanoglu, Miller, & Kwansa, 2012; Jackson, 2009: Kim, Brewer, & Bernhard, 2008; Heracleous, & Wirtz, 2006).

Implementation of biometric applications in the hospitality industry is emerging (Jackson, 2009) as such technologies have potential to offer various benefits to hotel operations and the guest experience. For example, in operations it automates employee clock in and clock out, and in terms of guest experiences, it can be embedded in customer relationship marketing systems (i.e. facial recognition of VIP guests when entering to a casino).

Research on biometric context currently focuses on biometric use in security, business, technological and government applications. There are a few studies that investigated biometric technologies from the hospitality industry's point of view (e.g. Bilgihan et al., 2009; Jackson, 2009; Morosan, 2012; Murphy & Rottet, 2009). Previous studies in this area have generally investigated biometric adoption only from the customers' viewpoint. The perception of hotel managers towards biometric technology has not yet been fully investigated. This study aims to fill a gap by examining current and potential future uses of biometric technologies from the managers' point of view.

The biometric systems revolve around a core biometric verification system which, when deployed by hotels provides best in class security and ease of management in several departments. In some countries, for security concerns and fulfill government requirements, hotels need to keep identity records and/or biometric records of all guests. These records are a great help to law enforcement agencies in case of need. The main concern for the management of any hotel is to offer robust security to its guests, making sure that their stay will be without any problems. To succeed this objective, hotels should deploy a very structured and professional security policy. It should ensure safety of its guests, staff and the estate. However, at the same time, biometrics is a rising and contentious topic in which civil liberties groups declare concern over privacy and identity issues. Biometric technologies may face resistance from managers and customers mainly due to its cost and privacy issues (Blank, 2006). Biometric laws and regulations are in the development process and biometric standards are being tested. Face recognition biometrics have not gotten to the point of fingerprinting, but with constant technological advances and with security threats, researchers and biometric developers will further develop this security technology for the twenty-first century (Osborn, 2005).

Biometric technology may bring several advantages and disadvantages to hotels and its guests. However, there is limited research on the factors that impact utilization of biometric technologies in hotels. For this reason, the purpose of this study is to examine the types of biometric technologies adopted by hotels and the perception of hotel managers toward biometric technology applications. This study uses the perception of hotel managers to assess the future potential adoptions and barriers of biometric technology applications. More specifically this study attempts to answers the following questions:

1. Which biometric technology applications are used in hotels?
2. What are the purposes of using biometric technology applications in hotels?
3. What are the reasons for not using biometric technologies in hotels?
4. What is the perception of hotel managers who adopt biometric technology applications?

Literature Review

The Modes of Biometrics as a Novel Technology Tool

A biometric system is used in two major ways, which are verification and identification (Jackson, 2009). Biometric systems might seem complex, but all of them tend to use the same three basic steps that are listed below (Sanchez-Reillo, 2000). First phase is "**enrollment**". The first time a person uses a biometric system; it records basic information about the person, such as name or an employee identification number. Later, it captures an image or recording of the person's specific trait, such as fingerprint. The next phase is "**storage**". It refers to storing the information. Most systems do not store the complete image or recording. They instead analyze the trait of people and translate it into a code or graph. Some systems also record this data onto a smart card. The final phase is "**comparison**" where the next time a person uses the system. It compares the trait that the user presents with the information on file. Table 1 shows summarized comparison of the features of biometric technologies (Bolle, Connell, Pankanti, Ratha & Senior, 2004; Harris & Yen, 2002; Jain et al., 2004; Kleist, Riley & Pearson 2005; Woodward, Orlans & Higgins, 2003).

Table 1: Comparison of Biometric Technologies

	Fingerprint	Facial Recognition	Hand Geometry	Iris Scan	Voice Recognition
Accuracy	H	L	M	H	L
Ease of Use	H	M	H	M	H
User Acceptance	M	H	M	L	H
Performance	H	M	M	M	L
Distinctiveness	H	L	M	H	L
Privacy Concerns	H	H	M	H	L
Cost	L	L-M	M	H	L

Note: High, Medium, and Low are denoted by H, M, and L, respectively.

Biometric Technology in the Hotel Industry

Latest security technologies like biometrics, infrared access, smart card access, and custom-made, ID-card printers are available in the market to help hoteliers to enhance safety and security (Oliva, 2003). A survey conducted by Hotel Asia Pacific Magazine and Pertlink, found that one in three hoteliers fear for the safety of their properties. Even more interesting was the fact that nearly 50% of respondents admitted they had not increased investments in security (Hotel Online, 2003). On the other hand, according to a study by Murphy and Rottet (2009) 87.3% of leisure guests are favorably pre-disposed to use biometric technologies for guest services, mostly sport and outdoor activities. This study found that travelers from North America might be more willing than other categories of travelers to use and adopt biometric technologies.

Unlike other conventional identification methods, the personal traits scanned by biometrics are difficult to lose, forget or copy. For this reason, it is considered to be safer and more secure than other conventional methods, such as keys, cards or passwords. For instance, when a hotel guest uses hotel services such as a bar, restaurant or any other paid services, he/she is required to verify his biometric identity by placing their finger on the biometric reader on the Point of Sale System (POS) instead of only their signature. This prevents impersonation and eliminates any possible disputes at the time of final billing regarding the use of these paid services. Beside customer recognition and verification, there are many possible future applications of biometrics, such as keeping time and attendance of employees, Network/Personal Computer (PC) Login Security, and Employee Recognition. Furthermore, research estimates that businesses can save 2.2% of gross payroll annually on average by eliminating buddy punching through the use of biometric technology. The American Payroll Association states that a typical business can save up to $1,000 per employee per year with biometric time and attendance systems (Stone, 2012).

Biometric technology applications that are used in hotels include biometric in-room safes, iris scanning and face recognition systems designed to allow staff and guests access to certain areas (Adams, 2002; Simon, 2004). More recent technologies include face recognition at hotel entrances to identify VIP guests. Usually, hotels do not offer biometric technologies due to reliability, lack of standards (Vijan, 2004), perceived intrusiveness (Singh & Kasavana, 2005), and privacy concerns (Adler, 2008; Kim et al., 2008; Tsai, 2007). On the other hand, it is agreed that biometric technologies can add value to guests' hotel stay experiences (Murphy & Rottet, 2009). In addition, they can help hotels reduce costs and fraud, and increase accuracy in transaction processing (Murphy & Rottet, 2009), while offering users security and convenience (Ives et al., 2005; Jones, Williams, Hillier, & Comfort, 2007).

Biometric technologies provide convenience to guests by allowing them to check in/out, access guest areas, and make payments with unprecedented convenience and speed (Morosan, 2012). Although the overall cost of biometric hardware is decreasing significantly, at a hotel's scale, biometric systems represent considerable investments (Kim, 2009). Accordingly, hoteliers need better insights with regards to biometric technologies.

The hotel industry requires an open and friendly environment where customers can come and relax without having to worry about their security. Simultaneously, hotel companies are aware that security is a top concern both to travelers and their establishments. Generally, the hotel industry has long suffered from security breaches, including network and systems security, theft by employees, credit card theft and fraud among many others (Barrier, 2001; Rinehart, 2000). In addition, since 9/11, security awareness has significantly increased in public areas (Bowyer, 2004), such as hotels and airports. Hotel companies feel the pressure to manage risk, loss prevention, and fraud.

Various research firms and industry experts anticipate the growth of the biometric industry to be significant in the near future. A study from Unisys Corporation points out that almost 70% of surveyed consumers are in support of using biometrics as a way of verifying identity, as long as that verification is conducted by trusted organization. The Unisys survey also saw 66% of respondents favoring biometrics as a method of combating identity theft and fraud; the survey compared biometrics in this category to other credential-type methods, including tokens and smart cards. The percentage of support is slightly up over a September 2005 study by Unisys, which was 61% of surveyed consumers favoring biometrics (SecurityInfoWatch.com, 2009). Regardless of the prediction, it is clear that the commercial use of biometrics is expanding worldwide. For example, facial and iris recognition are incorporated into automated teller machines (ATMs); financial institutions use finger scanning to identify clients; and finger geometry is used to control access to major theme parks. Fingerprint applications gaining a significant step in the hospitality areas. For instance, over 20,000 Owens-Illinois employees punch in and out each day using such devices, and more than 30 individuals at Krispy Kreme doughnut shops track their stores' employees in this manner. Likewise, the Decatur Hotel Group in New Orleans started implementing biometrics at its 12 hotels. Aramark Sports and Entertainment Information Technology installed fingerprint recognition systems at its main employee entrances, kitchens, human resources departments, administrative offices and other areas with high visibility (Spence, 2003).

In the past, technology issues in hotels have been handled on a reactive basis, namely after the issue arises. However, recent technology trends have focused on managed services. The managed services proactively monitoring technology can significantly reduce the negative issues that arise when an unexpected problem occurs. Those hotel systems that most effectively use the latest developments in technology will leave their competition far behind them in relation to success in their occupancy and hotel operations (Aronson, 2007). Among all biometric applications, fingerprint-based identification is the oldest method that has been successfully used in numerous applications.

Biometrics and Security in Hotel Companies

Biometric technologies aim to reduce fraud and eliminate risks associated with security (Singhal & Jain, 2011). Recently, airports, financial organizations, police departments, hospitals and businesses of all sizes have been integrating biometric technology applications into their work place. Organizations recognize the potential benefits of investing in biometric technologies (Singhal & Jain, 2011). Hotels may be considered as soft targets due to their nature of being open and accessible to general public (Parton, 2007). For instance, terrorist

attacks on the Grand Hyatt, Radisson SAS and Days Inn hotels in Amman killed 60 people and caused hundreds of injuries. Therefore, security has emerged to be an important issue for hoteliers, particularly at the luxury end of the market. Furthermore, hotels have long suffered from security breaches, including network and systems security, theft by employees, and credit card theft and fraud among many others (Rinehart, 2000). Biometric technologies in hotels can potentially improve room security, control access to restricted areas, and limit access to critical data.

Technology Acceptance Model (TAM)

As with any novel technology, user acceptance of new Information Technology is usually hard to gauge and policies to introduce and ensure adequate and correct usage of such technologies are often lacking (James, Prim, Boswell, Reithel & Barkhi, 2006). Security technologies have extensive applicability to different organizational contexts that may present unusual and varied adoption considerations (James et al., 2006). Technology Acceptance Model (Davis, Bagozzi, & Warshaw, 1989) is the theoretical foundation for most of the research that investigated user acceptance of information technologies. TAM presents the precursors of information system acceptance by providing a basis for tracing the impact of external factors on internal beliefs, attitudes and intentions. The model suggests that actual system use is determined by both perceived usefulness and perceived ease of use of the technologies. Therefore, in order to be used by hotels, the biometric technologies should offer usefulness for both employees and guests and they should be easy to use.

Methodology

A descriptive, cross sectional survey was developed based on extensive review of literature (Jackson, 2009; Kim, Brewer, & Bernhard, 2008) and expert opinions. The population for this survey was property level executive managers in the U.S. hotels. For this purpose, the members of American Hotel and Lodging Association (AHLA), the largest organization that represents American Hotels, was selected as the target population for this study. In the AHLA Database, there were 46,498 members from all over the world. All members that are outside of the United States were deselected from the database. This left 30,924 members and 26, 841 hotels in the database. The executive managers of all these hotels were listed in an Excel spreadsheet alphabetically. Limiting the number of the managers to one thousand, was deemed to be sufficient to get the perceptions for the purpose of this study, a random number was generated by using RAND function. Then, these managers were re-sorted based on this random number. The top 1000 managers that had an email address were selected as the sample for this study.

The survey instrument consisted of four sections: 1) biometric technology applications used; 2) reasons for using and not using biometric technology applications; 3) perceptions about biometric technology applications as adapted from Kim et al (2008) and 4) demographics of the respondent and characteristics of the hotel.

Findings and Discussions

Out of the 1000 email invitations sent, 255 valid responses were collected with a 25.5% response rate. Of the participants, 68% of the respondents were male while 32% were female. About 32% of the respondents had a bachelor's degree while 23.4% had a master's degree, 14.3% had some college degree. Thirty-two percent of the respondents were owners, 28.6% were general manager, 10.4% were sales and marketing managers. The sample used in this study represents US hotel manager demographics (Nebel et al., 1995). In terms of the hotels that the respondents worked for, 39.5% were mid-priced properties, 30.3% were upscale, 13.2% were luxury, and 10.5% were budget and economy hotels. About quarter of these hotels had less than 50 rooms, another quarter had 51-100 rooms, 18.2% had 101-200 rooms, and 13.2% had 201-500 rooms. About 37% of the hotels were in business more than 20 years, 26.7% for 11-20 years, 20% for 6-10 years, 12% for 1-5 years and 4% for less than 1 year.

The first research question of this study aimed to investigate the type of biometric technology applications used in hotels. Table 2 shows the current uses of biometric technologies in hotels. Out of the 255 respondents, only 21 of them (8.2%) reported that they use some kind of biometric technology in their hotels. The adoption level of biometric technologies was low as expected given the novelty of the technology. According to the study findings, among the hoteliers that use a biometric technology application, the most common biometric application used in hotels is fingerprint scanning (42.9%). The main reason of this finding might be the fact that a greater variety of fingerprint devices are available than for any other biometric (Liu & Silverman, 2001). As the prices of these devices and processing costs fall, using fingerprints for user verification may gain wider acceptance. Fingerprint devices were followed by hand geometry and palm print scanning (28.6%) and signature recognition (14.3%), face recognition (14.3%). Iris scanning and voice recognition were found not to be used in hotels. Iris scanning compared to most of the other tools has a relatively lower ease of use (Liu & Silverman, 2001).

Table 2: Current uses of biometric technology applications in hotels

Biometric Application	Frequency	%
Fingerprint scanning	9	42.9%
Face recognition	3	14.3%
Hand geometry and palm print scanning	6	28.6%
Iris scanning	0	0.0%
Voice recognition	0	0.0%
Signature recognition	3	14.3%
Total	21	
N=255		

The second research question of this study aimed to investigate the purposes of using biometric technology applications in hotels. It was found that the most frequently reported reason for using biometric technology applications in hotels is employee attendance tracking (71.4%), followed by door lock (14.3%) and hotel security (14.3%). McIntosh (2009) reported

that employee attendance tracking systems are used to help reduce hourly payroll costs, prevent unauthorized overtime and stop timecard misuse such as buddy punching. Hotel workers are usually paid on an hourly basis (Krause et al., 2005); therefore, it is explicable that hotels prefer to deploy biometric technology applications for employee attendance tracking. This finding suggests that the participating hotels adopted biometric technologies mostly for operations and managing cost, not for the guests.

Table 3: The purpose of using biometric technology applications in hotels

Purpose	Frequency	%
Employee attendance tracking	15	71.4%
Door lock	3	14.3%
Hotel security	3	14.3%
Total	21	

With regards to the third research question that examined the potential reasons for not using biometric technologies in hotels, it was found that a high majority of hotels (91.8%) do not utilize a biometric application. As noted in Table 4, the most frequently reported reason for not using a biometric application in a hotel was the unfamiliarity with the technology (42.3%). It appears that hoteliers simply do not know enough about the biometric technology applications and their potential advantages. The reason behind this might be the fact that the hotel industry is usually slow in accepting technological changes (Donaghy et al., 1997). Accordingly, biometrics vendors are advised to introduce their biometric technology applications and their advantages for the hoteliers. The second most reported reason was the lack of need (39.7%), followed by the cost (28.2%). As Polemi (1997) highlighted earlier, most of the biometric systems are expensive and this puts a barrier in the expansion of the biometric market. About 3% reported other reasons such as "too soon for guests to accept", "limited application and interface", and "legal issues".

Table 4: Reasons for not using biometric technology applications

Reason	Frequency	%
Too expensive	66	28.2%
There is no need	93	39.7%
Not familiar with technology	99	42.3%
Privacy issues	18	7.7%
Other	7	3.0%
N=234		

In order to investigate the perceptions of the hotel managers, mean and standard deviation of biometric technology perception statements was calculated (See Table 5). The Cronbach's alpha score was calculated to measure the reliability of this scale as it was used for the first time in this study and the items were created from the literature. The Cronbach's

alpha was .83, suggesting that the scale is reliable based on the suggested thresholds by Hair et al. (1998). As presented in Table 5, the respondents agreed that fingerprint door locks would be more convenient than electronic key-based door locks (M=3.64). Similarly, respondents agreed that fingerprint door lock would be more secure than keycard lock (M=3.61) and it will keep hotels more secure (M=3.52). Although not strongly, the participants agreed that those biometric technologies would result in faster service. The respondents slightly disagreed that using biometric technologies in hotels at this time is not a good idea. Similarly, they had privacy concerns over the use of biometric technology applications in hotels. This finding confirms the previous studies as biometric technologies often conflict with personal privacy issues (James et al., 2006). The tradeoff between maintaining a desired level of security while maintaining a sufficient level of privacy for an individual is a challenge that the hoteliers need to tackle.

Table 5: Biometric technology perception statements

Statement	Mean	s.d.	Mean df
A biometric fingerprint door lock will provide my customers with more personal convenience than a keycard lock.	3.64	1.13	1.28*
A biometric fingerprint door lock will keep my customers' room more secure than a keycard lock.	3.61	1.09	1.13*
A biometric technology will keep my hotel property more secure.	3.52	1.05	1.08*
Biometric technology will protect my customers from identity thefts (because fingerprints are encrypted and stored in a safe way).	3.30	1.09	1.04*
Biometric technologies will give my customers faster service.	3.01	0.99	0.72*
Using biometric technologies in my hotel is a good idea.	2.96	1.08	0.70*
I have no privacy concerns about using a biometric technology in my hotel.	2.74	1.26	0.84*

N=225
1=Strongly Disagree 5=Strongly Agree
* α=0.05 level

A t-test was conducted to understand if there is a significant difference in the biometric technology application perceptions between hotels that had a biometric technology application and hotels that did not. As expected, in all perception statements, the hotels that utilized a biometric technology application agreed significantly more (α=0.05 level) with the statements than the hotels that did not. Therefore, it can be claimed that if hotels are familiar with the biometric technology, they are more likely to believe that it can be beneficial for the company. Hotels that already deployed biometric technologies believed that such technologies

would protect customers from identity thefts, make the property more secure and it will be convenient for the customers. Moreover, they believed that such technologies could lead to faster service (e.g. payment via fingerprint). Hotel managers who had experience and essential knowledge about biometric technologies believed in the positive consequences of using the systems compared to managers that were unfamiliar with such technologies. This finding is consistent with Broadbent et al. (2009) as they found out that lack of familiarity with technology could be a reason for people feeling uncertain about technologies. Consistent with the study findings of Koenigsfeld, Youn, Perdue and Woods (2012), it is perhaps important to educate and train managers so they can evaluate the hotel company's technology needs and recommend appropriate technological applications.

The questionnaire also included an open-ended question to capture the opinions of hotel managers about biometric technologies. The respondents' statements were content analyzed and according to the findings from their statements, the respondents were mainly concerned about the acceptance of biometric technologies from consumers' end. For example, one respondent stated, "*I am concerned about guest acceptance of the technology*". Similarly, another respondent noted, "*The guest will have to demand in order for this to work. With a key it is simple, just give the key. I am not sure if guests will like the hotel collecting the fingerprints from them. We have a hard time getting them to give their Driver License. How to prevent the theft of the finger print data?*" Another respondent stated *"I suspect guests may have an issue, particularly in these days of increased government activity and shows like CSI. I think other technologies such as cell phone and RFID may be better accepted for hotel door lock schemes*". In a similar vein, another respondent indicated that "*As long as it is not a commonly established standard to take guests' biometric measures, it will be difficult to convince a guest and get the trust from him to leave the biometric data with the hotel*". Another theme emerged from the qualitative findings was privacy. Several respondents agreed that their guests insist on privacy. The following statement by one of the respondents can summarize this theme "*Our guests do insist on privacy, and they might find fingerprinting to be invasive.*"

A number of respondents further claimed that biometric technology would be useful for in-room safes. Therefore, this may present opportunities for in-room safe vendors. Some of the respondents highlighted the reliability of the biometric technologies: "*While the technology seems like a good idea, my main concern would be the reliability. We already deal with key issues (dead keys, dead locks).*" A number of respondents were aware of integration of biometric technologies with customer relationship marketing. For example, one of them stated that "*employees use more than guest use but with guest use could create more Customer Management Relationships…*"

Several respondents admitted that they had limited knowledge of biometric technologies, "*I would like to know more about biometric locks that are easily programmable, especially for any new construction we might take*". The respondents were familiar with biometric technologies for employee tracking, however, they were not aware of guest technologies. One respondent stated "*we use biometric technology only for attendance tracking, but using it for room security is a good idea that I would like to pursue*". Finally, a very high majority of the respondents commented about the cost of biometric technologies. Comments on this issue were similar to the following statement: "*cost to implement this technology and technical support might be more than we are willing to spend at this time*".

Conclusions and Recommendations

This study aimed to examine the type of biometric technologies adopted by hotels and the perception of hotel managers toward use of biometric technology applications in hotel companies. The findings of this study suggest that there definitely is a future in using biometric technology applications in hotels in the future. However, according to study findings neither guests nor hoteliers are fully ready for using such applications. The most frequent use of biometric technology application is fingerprint scanning. It is known that "buddy-punching" in which someone clocks a friend in for work signing in is a significant problem in the hotel industry. Biometric technology applications may help hotels save an average 2.2% of gross payroll annually by using such fingerprint terminals to clock in and out. In tight economic times, such a saving may be substantial. Biometric application vendors may propose hotels to use fingerprint devices in attendance tracking. This way, hoteliers would be introduced to the biometric technology with a solid return on investment. Subsequently, other uses of biometric technology applications can be introduced.

According to the study findings, the main reason for not using a biometric application in hotels in the unfamiliarity with the technology by hotel managers and owners. It appears that hoteliers do not have much knowledge about such applications and their potential advantages. Cost of these applications appears to be another major barrier to adoption of biometric technology applications. Vendors should provide solid case studies that show the return on investment on the use of biometric technology applications in hotels. It will help information technology managers secure funding for this investment.

Hoteliers seem to have significant privacy concerns about the use of biometric technology applications in hotels. One can claim that even though security problems exist with current technologies such as keycard locks or paying with credit cards, when a keycard or credit card is stolen, they can be replaced easily. However, when biometric information of a guest or hotel staff member is stolen, replacing it may be impossible. Unless vendors prove and convince hoteliers and guests that the biometric technology applications are 100% safe, it seems that the adoption rate may suffer for some time. The study findings also support this statement in that if hotels use a biometric technology application, the managers' perceptions towards it are more positive than managers whose hotels do not have a biometric technology application. In this regard, vendors may create a business model where they can install biometric technology applications in hotels free of charge for a limited time. This will allow the hotel managers to see the benefits first hand.

Potential uses of biometric technologies in the hotel industry are endless. For example, casinos have already adopted this system. For example, Bally's uses biometric recognition to solve business problems at the point of play. Their system passively identifies players at the game and tracks their activities; further the system is connected with customer relationship marketing and provides input for the system. Such systems can also be linked to any existing lists of excluded players, enabling instant messages to be sent to security when they enter to the property, similarly it could identify VIP guests. Another application might be validating employee identity before allowing entry to gaming devices.

Biometric technologies have also tremendous opportunities for chain hotels since once the guest checks in to the property, the system remembers guest preferences from hotel-to-hotel in locations across the world and they could open their assigned guestroom with only one time registration to the system. Furthermore, as Wang (2012) suggests biometrics

technologies provide solutions to forgotten and stolen password issues. Hotel employees can use biometric technologies to reduce the time spent on password-related problems.

The study findings suggest that hotel managers still have limited knowledge about biometric technologies. However, it is also found that the hoteliers that adopt such technologies are aware that biometric technology applications can play a role in their operations and investments into this area will bring potential benefits. Biometrics in the US lodging industry is still in the early stage as only the minority of hotels have adopted biometric technologies. Continued privacy concerns, unfamiliarity with the technology, limited need, and the high installment costs seem evident for slow adoption.

There is potential for biometric technology usage in other hospitality industry segments. For instance, airlines are sensitive to physical access because of security concerns. Thus, biometrics can be used in access control to provide more security and quicken the check-in processes (Wang, 2012). Aviation transportation in the USA has been using biometric technologies to verify and authenticate the identities of both passengers and employees. The Federal Aviation Administration (FAA), the Department of Homeland Security (DHS), and the Transportation Security Administration (TSA) have been investigating the use of biometrics for security, which includes access control to secure areas of an airport and identifying travelers, control of people moving into or out of protected areas such as physical buildings and information systems (Wang, 2012). Furthermore, restaurants can benefit from biometric technologies. Many point-of-sale systems are integrated with fingerprint scanners for user sign-in and out. Such method eliminates the need for employees to carry the magnetic swipe cards and remember a password.

Like any other study, this study has some limitations. This study employed the members of American Hotel and Lodging Association that had email addresses. This limitation may have resulted that some members that did not have email addresses were excluded. Future studies can examine the reasons for not accepting biometric technologies in hotels, for example possible studies might use Technology Acceptance Model to understand the roles of perceived ease of use and perceived usefulness on adopting biometric technologies. This research should open doors for future research. First, future studies are advised to develop theoretical models and test them empirically. TAM would be a suitable model to test biometric technology adoption in the lodging industry. Second, future studies should investigate the biometric technology adoption from the guests' point of view. Future research should consider potential safety/security strategies, and ethical aspects surrounding information securitization of biometric technologies in the lodging industry. Finally, future studies may utilize semi-structured interviews and Delphi method (Paraskevas & Saunders, 2012; Sobaih, Ritchie, & Jones, 2012) to collect data from hotel managers and guests to solicit their opinions about utilizing such technologies in hotel companies.

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Private Club Financial Performance

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Abstract

This article reveals the median financial results for the club industry for 2011 using 24 financial ratios. The results are based on the submission of balance sheet and selected income statement numbers from 80 clubs. The ratios are reported as median results for the entire sample as well as the median results for the top and low performing clubs delineated by return on assets. The biggest differences between the two extreme groups of clubs are (1) average collection period, (2) operating cash flows to current liabilities and long-term debt, (3) fines interest earned, (4) fixed charge coverage ratio, (5) food and beverage inventory turnovers, (6) profit margin, (7) return on assets, (8) operating efficiency ratio, (9) labor cost percentage.

Keywords: clubs, liquidity ratios, solvency ratios, operating ratios, profitability ratios, activity ratios.

Introduction

The year 2011 marked the beginning of a new decade with hopes of a sharp upward turn of the economy, better economic indicators, and lower unemployment rates. Although unemployment rates did drop from the highest of 10% in October 2009, the monthly reported rates in 2011 were mostly at the 9.0 and 9.1 levels with the last quarter finally breaking the 9.0 mark and reported at 8.9, 8.7 and ended in December at 8.5% (Labor force statistics, Bureau of Labor Statistics, 2012). The average annual consumer price index for the year is 224.939, with no signs of slowing down (Consumer price index, Bureau of Labor Statistics, 2012).

Many club executives have been waiting patiently for the industry to rebound since its banner year in 2004. For the past seven years, the industry has been very disciplined, watching all aspects of the business, trying to satisfy the membership, marketing new services, upgrading the clubhouse, golf courses, and other athletic facilities, accounting for every cost and revenue source. While this article reports the state of the industry for 2011 with the median financial performance indicators as benchmarks, the success of some clubs being the top performers and the struggles of others being the low performers will also be highlighted in two subgroups. Their financial performance in terms of their financial ratios will be compared so as to identify why certain clubs are able to perform more successfully. In the current economy when every single dollar counts, quick dashboard benchmarks that can provide club management and executives just-in-time information to make decisions will

help provide a more stable financial picture for the operation, thereby providing longer term benefits to the members.

Need and Purpose of the Study

The need to manage a business successfully has never been more important. Even in the club industry where most clubs are still non-profit in orientation, making a profit can easily translate into reinvesting in the club for enhanced services so that members can be served better. Having an adequate reserve also means less or no assessment to members which again translates into better benefits to the membership. To ensure a business is financially healthy, club managers must set proper financial goals with their boards, then set intermediate goals with their staff, and examine their financial results in order to make proper operating decisions.

There are a number of good publications for the club business, including those of Pannell Kerr Foster (PKF) and McGladrey and Pullen LLP. They supply great operating statistics, focusing on the statement of activities (or income statement) instead of the balance sheet (Schmidgall & DeFranco, 2004). In addition, general financial ratios publications such as the Business Almanac, Risk Management Association's Annual Statement Studies (formerly Robert and Morris Associates), and Dun and Bradstreet (D&B), all code the club industry under OSHA's standard industry classification code of 7997. This code is determined by the government and covers all sorts of clubs including aviation, bridge, baseball, beach, bowling leagues, and even handball clubs as wells as country, golf, yacht, and city clubs (DeFranco and Schmidgall, 2008). Thus, a unique study for clubs most represented by the Club Managers Association of America, where our hospitality students will most likely be employed, is of value.

This study therefore reports 24 selected financial ratios for the club industry in 2011. An analysis of the financial results, in terms of similarities and differences of the top and low performers as determined by the return on assets (ROA) is also included. For this study, the top performers are those that reported in the top 20% ROA of the group while the low performers are clubs whose ROAs are in the bottom 20%. Median ratios, key balance sheet and statement of activities financial data are presented.

Literature Review

Just as in any business, the club industry needs standards and benchmarks. Benchmarks are needed for comparison so a business within an industry can compare itself to its competitors. Similarly, benchmarks can also be set internally in terms of budgets and goals for a company to gauge its performance when compared to its budgeted amounts or set goals. Benchmarking is a process started in the manufacturing industry and documented by Camp (1989) where he reported that Xerox classified benchmarking as planning, analysis, integration, action, and finally maturity. Camp also stressed that a system of continuous improvement is crucial to ensure continued success.

In the club business, the financial standards were first set over 65 years ago with the publication of the uniform system of accounts for clubs. The current seventh edition (Club Managers Association of America, 2012) was published in November 2012. Between each edition, practitioners and educators came together to provide input as to what needs to be

updated so the Uniform System is a useful tool for the industry (DeFranco & Schmidgall, 2010). The Uniform System has examples of statements and a very detailed section covering ratio analysis. The ratios that are found in most financial publications can be classified into five major categories: liquidity, solvency, activity, profitability and operating, with their uses and corresponding ratios indicated below (DeFranco and Lattin, 2007).

Category	Use	Ratios
Liquidity	ability of clubs to meet short-term obligations	Current ratio Accounts receivable turnover (times and days) Operating cash flow to current liabilities Operating cash flow to long-term debt
Solvency	potential of clubs in meeting their long-term obligations	Long-term debt to total capitalization Debt to equity Times interest earned Fixed charge coverage
Activity	indicate management's effectiveness in using the assets of the club	Food inventory turnover (times and days) Beverage inventory turnover (times and days) Golf merchandise inventory turnover (times and days) Property and equipment turnover Total asset turnover
Profitability	assist management in determining profit level	Profit margin Return on assets Operating efficiency
Operating	assist management in determining efficiency	Food cost Beverage cost Golf merchandise cost Labor cost

Ratios and financial performance are important topics and have been researched and results shared. However, it was really not until the 1980s that the industry began looking at financial and ratio analyses more closely. The body of research that started over thirty plus years ago started in the lodging business with Geller and Schmidgall (1984), Temling (1985), and Schmidgall (1988) all publishing on ratios for the lodging industry. In the early 1990s, Swanson (1991) published the first detailed research on just the liquidity of lodging firms. In 2002, Singh and Schmidgall (2002) also started their research on financial ratios in the lodging industry.

In the club area, Schmidgall first teamed up with Damitio and wrote the text Accounting for Club Operations (2001) which is a standard for the club industry, endorsed by the Club Managers Association of America. For the past nine years, Schmidgall teamed up with DeFranco and published a series of articles on club ratios, setting the first set of benchmarks in 2004 (Schmidgall & DeFranco, 2004), analyzing trends since 2007 (DeFranco & Schmidgall, 2007; DeFranco & Schmidgall, 2008, DeFranco & Schmidgall, 2009), investigating inventory practices (DeFranco & Schmidgall, 2009), and began looking at the

revision of the 2003 edition of the Uniform System (DeFranco & Schmidgall, 2010). In this body of research, one concern that has surfaced was the amount of debt that is increasing over the years (DeFranco & Schmidgall, 2009).

In addition to ratios, Schmidgall and Singh (2007) also studied operating budgets of clubs and did a longitudinal analysis from 1986 to 2006 and found that while 48 percent of clubs prepared operating budgets and had a tentative financial goal prior to starting the budgeting process, 75% of clubs focused on the bottom-line as a tentative financial goal.

The Collection and Analysis of Data

The Hospitality Financial and Technology Professionals (HFTP) is most gracious with sharing its club financial membership with the researchers for the distribution of the survey. Previous research of this type has included members from both HFTP and the Club Managers Association of American (CMAA). However, at the end, club financial professionals have ready access to the financial information, so only the membership of HFTP was sampled. The questionnaire was divided into four areas: Part I consisted of demographic questions about the club such as type, number of members and geographic location; Parts II through IV asked for the balance sheet information at the beginning and end of 2011, statement of activities figures, and statement of cash flows amounts. Ratios are then calculated for analysis.

A total of 1000 surveys were sent, with 40 returned as "undeliverable", netting a sample size of 960. A final count of 80 surveys was received, yielding a response rate of nearly 8.3 percent. The most recent statistical software SPSS version was used for data compilation and analysis. This return rate is consistent with previous surveys done in club financial analysis (DeFranco & Schmidgall, 2008, 2009a, 2009b).

Results

As mentioned, three groups of statistics will be shared: the median, top performers and low performers. After all data were collected, the Uniform System of Financial Reporting of Clubs was used as a standard, and 24 ratios were calculated and reported. In this research, while average figures were used to describe the demographic characteristics of the clubs, median figures rather than mean averages were used for financial data calculation and analysis so that the data would not be skewed by financial figures of clubs that were at the extreme ends of the data continuum. In determining the top and low performers, the ratio of return on assets is used as the delineating measurement with the clubs reporting a return on assets in the top 20% designated as the top performers and the bottom 20% of clubs designated as the low performers.

The Clubs-2011

Controllers are the top contributor of information in this study, reporting in at 77%. Chief Financial Officer came in second place at 13% followed by Director of Finance at 4%. Assistant Controllers, General Managers, Others all were at 2%, totaling the 100% (See Table 1). In the low performing clubs, all contributors are Controllers. In the top

performing clubs, 86% of the respondents are controllers, 7% are Chief Financial Officers and the other 7% are Assistant Controllers.

Regarding the types of clubs, Table 1 shows that the majority of the respondents (63%) were from country clubs, followed fairly equally by city clubs (15%), golf clubs (12%), and others (10%). The distribution of the types of clubs among the low and top performers is quite similar to the average. The low performers have 61% of the clubs as country clubs and the remaining 39% were distributed evenly with 13% each in golf, city and others. For the top performers, 62% were country clubs and the remaining were found first in city clubs (19%), golf clubs (13%) and others (6%). Therefore, if there is any difference it will be that the top performers have the highest concentration of city clubs at 19%. It can very well be that city clubs, without the management and maintenance of a golf course, may be more nimble in adjusting to the economy.

The size of the clubs in terms of membership seemed to tell a slightly different story. The 501-750 member clubs made up 28% of this study, followed by the 1,001-1,500 group at 22%. There was only 8% reported both for the very small clubs with less than 300 members and the very large clubs of over 1,500 members. However, the low performing group has 37% of their clubs with 300-500 members and another 19% each in the less than 300 category and the 501-700 category while the top performing group has a very evenly distributed pattern with 21% reported in each subgroup of 501-750, 751-1,000, and 1,001-1,500. This group also has 15% over 1,500 members and also another 15% with less than 300 members. Thus, the top performing clubs tend to have more members than the lowest performing clubs.

As for location, the top performers had 67% of their clubs in the East whereas the average was at 54% and the low performers at 50%. The top performers also have the least concentration of clubs in central United States (13%) while the low performers has 31%. All three groups have a similar percentage of clubs in western United States. Thus, one may conclude that clubs in the eastern part of the states are more profitable.

Table 1. 2011 Demographics of Respondents

	Low Performers	Average	Top Performers
Title of respondents:			
Controllers	100%	77%	86%
CFOs	0	13	7
Director of Finance	0	4	0
Assistant Controllers	0	2	7
General Managers	0	2	0
Other	0	2	0
Total	100%	100%	100%
Types of clubs:			
Country Clubs	61%	63%	62%
Golf Clubs	13	12	13
City Clubs	13	15	19
Other Clubs	13	10	6

Total	1005	100%	100%
Number of Members:			
< 300	19%	8%	15%
300-500	37	19	7
501-750	19	28	21
751-1,000	0	14	21
1,001-1,500	19	22	21
> 1,500	6	8	15
Total	100%	100%	100%
Location of Clubs in US:			
East	50%	54%	67%
Central	31	25	13
West	19	21	20
Total	100%	100%	100%
Profit Orientation:			
For Profit	25%	13%	0%
Non Profit	75	85	94
Others	0	2	6
Total	100%	100%	100%

The profit orientation of the clubs perhaps is the one characteristic that is most ironic. While 25% of the low performers are for profit, only 13% of all respondents are for profit and none of the top performers are for profit. Thus, the profit orientation seems to have an inverse effect in the financial performance of the clubs in 2011.

Key Ratios

Twenty-four ratios are calculated this section. The median, together with the top and bottom 20% clubs, is reported as three groups in order to provide management with more insight and comparison points.

Liquidity Ratios

Liquidity ratios focus on a club's ability to pay its bills in the short-run. All ratios presented include numbers from the balance sheets of the clubs.

Current ratio = current assets / current liabilities.
A 1.0 current ratio means a club has the exact amount of current assets to cover and pay off its current debts. As seen in Table 2, the median current ratio was 2.00 for 2011, the top performers were at 2.10 while the low performers were at 1.43. Therefore, all clubs appear to be managing their short-term obligations well, even when some are struggling with their profitability which will be discussed later.

Accounts receivable turnover = total revenues / average accounts receivable (times and days)

The nature of the club industry is that little cash is paid by members as the club provides goods and services. Clubs generally bill members at the end of the month services are provided and members have until the end of the following month to pay. Therefore, accounts receivable for clubs are often significant.

Accounts receivable turnover can be measured as a number in times or by days. They work together to measure the speed of conversion of accounts receivables into cash, in other words, how fast clubs collect money that is owed to them. A median of 10.38 (35 days) was better than the 9.66 (38 days) reported in the banner year of 2004 (DeFranco & Schmidgall, 2008). This is great news. The top performers showed a 11.33 ratio which translates to an average collection period of 32 days, just slightly over a month. The low performers were behind the leaders, extending credit for a week more at 39 days with a ratio of 9.45. This low ratio can use some improvement as it will hinder the clubs' cash position, especially in tough economic times and thus needs to be closely monitored to see if certain policies can be improved.

Operating cash flows to current liabilities = operating cash flow / average current liabilities
This liquidity ratio has a median of 0.28. This means $0.28 of cash flow generated from operations (not by investing or financing activities) were provided by the club for payment toward each $1 of current debt. The top performers reported in at $0.42 while the low performers only reported a level of $0.11. The difference of this ratio between the top and low performing clubs is significant.

Solvency Ratios

Solvency should be evaluated from both balance sheet and income statement perspectives. Solvency ratios reveal the ability of a club to pay its bills in the long-run. Three essentially balance sheet ratios and two income statement ratios are presented.

Operating cash flows to long-term debt = operating cash flows / average long-term debt

This first solvency ratio is very similar to the last liquidity ratio discussed except it looks at a club's ability to pay its long-term debt. The short-term version has a median of $0.28 but the long-term version only showed a median of $0.10. The top performers showed $0.25 in the long-term version, while the low performers only reported a 0.05 ratio, meaning they only have $0.05 of operating cash flow to cover each $1.00 of long-term debt. Creditors do scrutinize solvency ratios when approving loans and such low ratios do not hold high promise especially for the low performers.

Long term debt to total capitalization = long term liabilities / (total long-term liabilities + total members' equity)

This second solvency ratio measures a club's long-term debt to its total capitalization. Thus, this is one of the few ratios where a smaller number is better as it signifies less debt incurred by the club and creditors prefer a lower ratio than other users of financial ratios. The 0.25 median means for every $1.00 of the clubs' long term debt and members' equity, $0.25 was financed by long-term debt. The top performing clubs reported

a 0.20 ratio meaning only 20% of the capitalization was financed by long-term debt, while the low performing clubs had a higher long-term debt ratio at 23%. Thus, the difference of this ratio between the top and low performers is minor.

Debt-equity ratio = total long-term liabilities / total members' equity

For 2011, the debt-equity ratio of the club industry was at 0.32. The difference between this ratio and the last one is that this one measures total debt as compared to equity only whereas the last one only looks at long-term debt and the total capitalization which is debt and equity combined. Thus, this ratio is a stricter measurement of debt level. Similarly, a smaller number is desired. The median of 0.32 showed that the median club had $0.32 debt to each $1.00 of equity. The low performers were at 0.30 and the top performers were at 0.25. It appeared that when clubs were ranked according to their return on assets, both low and top performing clubs were better than the median.

Times interest earned (TIE) = (net income + interest expense) / interest expense or = EBIT / interest expense

The TIE ratio measures the number of times a club can cover its interest payment obligation with its earnings before interest and tax. In previous years, the median club had TIEs from less than 1.00 to over 1.50 (DeFranco & Schmidgall, 2009b; DeFranco & Schmidgall, 2008). In 2011, this ratio was reported at 1.41. This means the median club had only $1.41 of earnings before interest and tax to cover every $1.00 of interest payment obligation. The top performers, with less debt (as seen in the previous ratios) reported a high TIE of 64.06, meaning they could pay their interest expense 64 times over. However, the lower performers were not as fortunate. Their TIE was -3.74. This means that they were not able to cover their interest obligations as they had a loss prior to their annual interest expense such that the loss was 3.74 times their interest obligation.

Fixed charge coverage (FCC) = (net income + interest expense + rent expense) / (interest expense + rent expense)

The fixed charge coverage is very similar to the TIE but it also includes the effect of rent expense. When rent is added to both the numerator and denominator of the TIE ratio, the median decreases to 1.15 and the top performers reported at 7.83 times while the low performers, still at a negative number, were at -0.24. Solvency from an income statement perspective as shown by both the TIE and FCC ratios are a real challenge for the low performers. Overall, the low performers do not have the profitability to handle their interest and rental expense.

Activity Ratios

Activity ratios measure management's ability to use assets entrusted to it to provide services and generate profits. Five activity ratios are reported.

Food inventory turnover = cost of food used / average food inventory (times and days)

For the year 2011, a 17.86 times food inventory turnover was reported as the median. When this number is divided into 365 days a year, on the average, food stayed 20 days as inventory before it was sold. One might expect the top performers to have a higher turnover ratio, keeping food in the club for a shorter period of time. Indeed, their ratio was at 19.54 or 19 days, just one day better. However, the low performers reported in at 13.74 times or 27 days. One extra week per cycle adds up to many weeks per year. Thus, the low performers should investigate their food inventory management practices and take appropriate steps to improve.

Beverage inventory turnover = cost of beverage sold / average beverage inventory (times and days)

The median beverage turnover was at 3.29 times or 111 days. While this is quite consistent with previous years (DeFranco and Schmidgall, 2007; DeFranco and Schmidgall, 2009b), the top performers reported a very low ratio in 2011 at only 1.43. In other words, they held their beverage inventory for 255 days. The low performers were at 2.12 times or 172 days, better than the top performers in this category. While there may be reasons why the clubs had to hold on to the beverage inventory, it appears to be good practice for each club to review their beverage inventory practices, including their purchasing and storage procedures to ensure that the clubs are not necessarily tying up funds in inventory which can otherwise be spent more wisely. Past research by these researchers has revealed that many clubs have extensive wine inventories. This could well be the reason the top performers have such a relative large beverage inventory.

Golf inventory turnover = cost of golf merchandise sold / average golf merchandise inventory (times and days)

Similar to the previous two ratios, this ratio measures the golf merchandise turnover. This ratio is expected to be much lower than food or perhaps similar or just slightly below beverage inventory turnover as we are looking at golf equipment, accessories, and clothing which are not perishable items. The median was at 1.91 times or 191 days. The top performers reported in at 2.88 (127 days), and even the low performing group beat the median at 2.38 times or 153 days; thus, both the top and low performing clubs beat the median numbers.

Property and equipment turnover = total revenues / average net fixed assets

The property and equipment turnover indicates how well a club uses its fixed assets to generate revenues. Therefore, a higher ratio is preferred. In 2011, the median was 0.68, which means for every $1.00 of net property and equipment, a median club was able to generate $.68 in revenues. Although the top performers are better in their return on assets, their revenue generation statistics were not overly impressive. The top performers were only able to generate $0.77 and the low performers were only able to generate $0.63.

Total asset turnover = total revenues / average total assets

This ratio takes the last ratio further as it measures not just property and equipment but all assets. In other words, this ratio measures the effectiveness of using all assets in a club to generate revenue. The median of 0.50 means for every dollar of total assets, the clubs were able to generate $0.50 in revenues for each $1.00 of total assets. The top performers were able to generate a bit more at a rate of $0.60 while the low performers were only one cent behind the median at $0.49. These numbers can surely use some improvement. Thus, the club industry may want to evaluate their revenue generating ability.

Profitability Ratios

Profitability ratios will clearly reveal a separation between the top and bottom financially performing clubs. Three profitability ratios are included. Profit margin focuses on the bottom line (net income) and the top line (total revenues). ROA compares the net income to the average total assets while the operating efficiency compares the income the GM is responsible for to total revenues.

Profit margin = net income / total revenues

The profit margin of the median club of only 0.5% was much less than the top performers at 12.6%. The low performers, at a loss, reported a negative profit margin of 8.8%. Thus, overall, the profitability of the club industry in 2011 was not positive. Yet, the top performers did reasonably well!

Return on assets = net income / average total assets

The median return on assets was at 0.2%, which translates to only two cents of net income to each dollar of assets. The difference is very pronounced between the top and low performers where the top performers reported in at 7.6% and the low performers were at a loss of -4.3%. In the activity ratios, it was evident that the low performing clubs were not able to generate a high level of revenues and in the last two ratios measuring profitability; it also appears that these clubs are having a difficult time to generate profits.

Operating efficiency ratio = income before fixed charges / total revenues

This final profitability ratio measures the effectiveness of management better than the other two profitability ratios because it considers income before fixed charges rather than the net income. Normally, fixed charges such as interest, depreciation and rent result from decisions made by the board of directors in which management does not have much control. The 2011 median response is 18.0%, the top performers' response is 32.2%, and more interestingly the low performers' have a positive result of 16.9% which indicates the fixed charges are posing some serious challenges for the low performers. From this perspective, the top performing clubs do nearly twice as well as the low performers.

Operating Ratios

Operating ratios focus on the day-to-day expenses of a club. The largest expense of clubs is always labor. In addition, this research also considered to various cost of sales as a percentage of the related revenues.

Food cost percentage = cost of food sold / food sales

The first three ratios in this category are complementary ratios to the inventory turnover ratios in the activity category. It would be prudent to view them as a group. The 2011 median food cost percentage was at 39.1%, with the top performers at 33.0% and the low performers at 38.4%. When viewed with the inventory ratios, while it appears the low performers were holding on to their food inventory longer, they were at least keeping the food costs relatively low compared to club industry average.

Beverage cost percentage = cost of beverages sold / beverage sales

The median beverage cost percentage was at 31.8% with the top performers at 29.1% and the low performers at only 28.3%. Again, the low performing group was doing its best to try to use cost management techniques to compensate for the inventory management challenges. A beverage cost of less than 30% for the low performing group is most commendable.

Table 2. Comparison of Key Financial Ratios of Top and Lower Performers in 2011

		Low Performers	Median	Top Performers
Liquidity Ratios				
	Current Ratio	1.43	2.00	2.10
	Accounts Receivable Turnover	9.45	10.38	11.33
	Average Collection Period	39 days	35 days	32 days
	Operating Cash Flows to Current Liabilities	0.11	0.28	0.42
Solvency Ratios				
	Operating Cash Flows to Long-term Debt	0.05	0.10	0.25
	Long-term Debt to Total Capitalization	0.23	0.25	0.20
	Debt-equity Ratio	0.30	0.32	0.25
	Times Interest Earned	-3.74	1.41	64.06
	Fixed Charge Coverage	-0.24	1.15	7.83
Activity Ratios				
Food Inventory Turnover				
a.	Times	13.74	17.86	19.54
b.	Days	27 days	20 days	19 days
Beverage Inventory Turnover				
a.	Times	2.12	3.29	1.43

b. Days	172 days	111days	255 days
Golf Merchandise Inventory Turnover			
a. Times	2.38	1.91	2.88
b. Days	153 days	191 days	127 days
Property & Equipment Turnover	0.63	0.68	0.77
Total Asset Turnover	0.49	0.50	0.60
Profitability Ratios			
Profit Margin	-8.8%	0.5%	12.6%
Return on Assets	-4.3%	0.2%	7.6%
Operating Efficiency	16.90%	18.0%	32.2%
Operating Ratios			
Food Cost Percentage	38.4%	39.1%	33.0%
Beverage Cost Percentage	28.3%	31.8%	29.1%
Golf Merchandise Cost Percentage	60.9%	37.8%	50.2%

Cost of golf merchandise percentage = cost of golf merchandise / golf merchandise sales

The cost of golf merchandise median percentage in 2011 was at 37.8%. The top performers reported a high percentage at 50.2%, and the low performers had the highest at 60.9%. This ratio had been managed well in the past year and the median of 37.8% showed was a great indicator. However, when clubs were ranked by their performance by their return of assets, their much higher cost percentage was not expected.

Labor cost = cost of labor / total sales

Labor cost is the highest cost in the club industry. The median of less than 50% at 46.6% was most commendable. The top performers' 41.1% was another reason for their relatively high net income level while the 48.1% for the low performers did not leave much to flow to the net income. Thus, club management especially for the low performers may also want to look into scheduling or training to see if some savings can be realized.

Key Balance Sheet and Statement of Activities Data Differences

Ratios are invaluable resources and can act as benchmarks for dashboards indicating the relationships between one account and another within and across different financial statements. Thus, utilizing the guidelines in the Uniform System of Financial Reporting for Clubs, information about key balance sheet and statement of activities accounts were collected, and ratios were calculated, and reported. However, it is also interesting to look at the raw data itself and compare the differences between top and low performing groups, to see if certain patterns exist that perhaps club managers can be alerted. Therefore, besides analyzing the set of twenty-four ratios, it is also wise to analyze the key dollar amounts in the financial statements.

Table 3 summarizes the balance sheet key accounts information for both top and low performers. The averages are medians and therefore will not add to a total and only selected amounts are shown. The dollar difference and percentage difference are also

presented between the low and top performing clubs. In terms of current assets, the top performers carried almost 65% more cash than the low performers at the end of the year. It is also expected that since the top performers have clubs of all sizes and the low performers are largely smaller clubs, the top performers would have a larger balance in account receivables and inventories. Although it is true in the case of accounts receivables and beverage inventories, it is not so for food. The top performers are able to carry about 19% less in food inventory which amounts to around $7,000 at the end of the year.

Table 3. Key Balance Sheet Financial Data Differences End of 2011 (Medians)

	Median	Low Performers	Top Performers	$ Change	% Change
Cash	$946,547	$741,938	$1,220,828	$478,890	64.55%
Accounts Receivable	737,000	673,417	823,525	150,108	22.29
Food Inventory	31,400	36,102	29,243	<6,859>	-19.00
Beverage Inventory	55,718	45,444	153,003	107,559	236.68
Total Current Assets	2,404,860	1,416,244	3,664,000	2,247,756	158.71
Total Fixed Assets (net)	11,248,400	9,221,517	12,843,954	3,622,437	39.28
Total Assets	16,150,224	12,055,438	16,630,348	4,574,910	37.95
Total Current Liabilities	1,199,584	988,139	1,745,468	757,329	76.64
Mortgage Payables Long-term	3,030,724	3,370,442	859,810	<2,510,632>	-74.49
Total Liabilities	3,917,984	2,440,296	3,068,148	627,852	25.73
Total Members' Equity	11,787,947	8,171,854	11,214,687	3,042,833	37.24

But overall, current assets of the most profitable clubs are 159% greater than the least profitable clubs. As expected the net fixed assets of the top performers are almost 40% greater than the least profitable clubs. This is no surprise as the average club for the top performers is larger than the average club for the bottom performers.

A major point of concern is the debt level of the low performers. This was already revealed in the ratio analysis. However, looking at the raw data in dollar amounts, the low performers were carrying over $3.3 million in mortgage payables while the top performers were carrying just over $850 thousand. The difference is huge. These mortgages do not only mean more debt but also translate into higher interest payments.

The Statement of Activities data can be found in Table 4. As expected, the top performers generate almost $3.40 million more in annual revenues than the low performers with the majority of such coming from dues ($1.86 million). In general, the top performers received 71% more in dues, generated 120% more in beverage and almost 160% more in golf pro shop sales. However, the top performers also have greater costs than the low performers. The top performing clubs have 33.8% more in payroll ($3.87M versus $2.89M).

Table 4. Key Statement of Activities Financial Data Differences in 2011 (Medians)

	Median	Low Performers	Top Performers	$ Change	% Change
Total Dues	$3,728,204	$2,628,721	$4,490,374	$1,861,653	70.82%
Total Food Sales	1,403,647	1,260,345	1,689,650	429,305	34.06
Total Beverage Sales	556,662	354,691	779,107	424,416	119.66
Total Golf Pro Shop Revenues	580,803	336,261	870,412	534,151	158.85
Total Initiation Fees	490,000	286,034	674,717	388,683	135.89
Total Revenues	7,587,519	6,001,063	9,397,209	3,396,146	56.59
Cost of Food Sold	548,336	483,427	557,812	74,385	15.39

Cost of Beverage Sold	117,207	100,531	226,851	126,320	125.65
Cost of Golf Merchandise Sold	219,711	204,671	436,894	232,223	113.46
Total Payroll Expenses	3,536,646	2,888,102	3,865,169	977,067	33.83
Interest Expense	87,255	111,748	18,776	<92,972>	-83.20
Deprecia-tion Expense	781,744	762,139	1,152,000	389,861	51.15
Rent/ Lease Expense	149,346	314,327	154,469	<159,858>	-50.86
Property Insurance Expense	112,000	90,974	173,127	82,153	90.30
Real Property Tax Expense	175,533	163,057	311,425	148,368	90.99
Utilities Expenses	306,994	231,174	260,928	29,754	12.87
Total Net Income	35,874	<529,694>	1,183,998	1,713,692	323.52
Total Operating Cash Flows	368,452	103,919	752,000	648,081	623.64

When one looks at the interest and rent expenses, the top performers have much lower interest expense ($18,776 versus $111,748) and also much less in rent/lease ($154,469 versus $314,327). The low performing clubs were clubs with fewer members so these clubs do not have the membership base to be able to generate the corresponding desired level of revenues. In addition, these clubs had higher fixed costs of interest and rent/lease expenses. It is therefore not surprising that the low performers logged in a loss of almost $530,000 as opposed to the top performers earning an income of over $1.18 million and the top performing clubs generated over six times the operating cash flows of the low performers.

Lessons Learned to Move Forward

Ratios by themselves are a good tool. Statement analyses by themselves also provide interesting information. Putting the two together, certain assumptions can be confirmed as the numbers start to tell a story. With these tools combined, the 2011 financial picture of the club industry is clearer. The industry as a whole is holding its ground but many clubs are still struggling. The general state of the economy is not showing very strong signs. Unemployment rates, if they are to improve, will only drop to the 7% range which is still not the 4%-5% in early 2000s. There is still a long way to go.

Nothing in business in today's world comes easy. Every penny saved is a penny earned. The top performers should not sit on their laurels and be content with their status. The business picture can change very quickly. For clubs that are tied to community development, as residents move in and out, the level of revenues will change. For city clubs that may be tied more to business memberships, as the economy changes, so will the membership. Even for regular country clubs, when the middle class members lose their jobs, their spending will need to be cut and $500 to $1000 per month membership dues suddenly become a burden. So, what can clubs do in the next several years to stay competitive and serve their membership well?

Takeaways

First, the top performers need to stay their course. Whatever they did in 2011 seemed to be working well. So, before making any rush judgment, it is prudent for clubs whose ratios and statement information bear good resemblance to this group to continue to do business the way they did. This does not mean that no change is ever needed. This simply means thinking before acting – and use the financial data as "reasons and justifications" to take or not to take actions.

Second, the low performers did beat the high performers in a couple of areas. They have significantly less beverage inventory (just over one-third) of the top performing clubs. Further, the less profitable clubs have a slightly lower cost of beverage percent than the most profitable clubs.

Third, the fixed charges are really posing many challenges to club managers in the low performing group. Therefore, if you believe that your fixed charges are higher than the majority and are hurting your ratios and profitability, you may want to investigate to see if loans can be refinanced or leases can be negotiated and take the alternatives to the board for consideration.

Fourth, if your club is losing membership, try new membership drives. Many clubs who have lost members can contact such members to welcome them back without a reinstatement fee. Giving up a short-term fee may bring the club more long-term gains. This is especially good for members who might have left the club due to their loss of employment. When they are once again employed, the re-joining of the club may not be too much of a financial burden.

Fifth, many clubs are trying out new forms of revenue generating ideas which may lead to new membership. For instance, some clubs are sponsoring more fitness classes, dance classes, yoga classes, spin classes, and open enrollment in these classes to non-

members at a higher rate, hoping to then sign up new members perhaps first for athletic membership, then a social membership, and finally a full membership.

Sixth, communication with all staff members is still an important key to success. These ratios and numbers can be intimidating to many outside the accounting office. Thus, it behooves the chief financial officer, director of finance, or the controller to prepare a dashboard report with some, if not all, of these 24 key ratios on a monthly basis. Communicate these numbers in the form of charts and tables rather than in statement forms. Post those charts in the employee break area or in places where employees often congregate.

Seventh, be vigilant in comparing budgeted to actual numbers. A selected group of ratios, such as cost percentages, can even be compiled on a weekly basis so that results can be compared to the budget and then communicated to all so that corrective actions can be taken before it is too late.

Eighth, don't just share – involve! It is also wise to post key indicators of the budget and again monitor those indicators and share with all employees. However, get the employees involved, too. Ask them for revenue generating ideas or cost savings ideas and set those goals with them. If an idea from an employee is chosen, award the employee with a small token of appreciation. When that same idea hits the goal of revenue enhancement or cost reduction, award that employee with a bigger recognition. All these help to build team spirit as well.

From Industry to Education

All the above points can be reinforced and taught in hospitality accounting and club management courses. Educators are engaging students more in active learning. Perhaps professors can incorporate some of the above takeaways as projects in class. Ask a club in your area to share a set of their financial statements. Obviously, names can be deleted or changed in case the clubs are sensitive about sharing financial information. Nothing makes the students more willing to learn if they see an actual set of financial statements rather than one from a textbook. It is through continuously challenging our students that we are able to produce the next generation of hospitality leaders.

Limitations

   Like many survey studies, this study reflects the results of the respondents which was only 8.3% of the clubs surveyed. The questionnaire requests numerous actually financial figures and as in the past several years many club financial executives appear to be reluctant to provide their results. Still 80 clubs results are provided which yields some very interesting and useful financial information. A greater response could possibly enable the calculation of ratios by type of club.

Future Research

   Future research could be focused on other ratios especially operating ratios. In addition businesses in other industry segments such as lodging, spas, and foodservice could be surveyed to determine similar ratios focusing primarily on balance sheet numbers. The results would be useful for managers as few studies have focused on balance sheet ratios especially at the property level.

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Characteristics of US Graduate Hospitality Programs

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Abstract

Despite the rapid growth in the quality and volume of hospitality graduate research and education in recent years, little information is available in the extant body of literature about the program choices of hospitality management graduate students, information that is crucial for program administrators and faculty in their attempts to attract the most promising students to their programs. This paper reports on a study among graduate students in US hospitality management programs designed to understand why they chose to pursue their degrees at their programs of choice. Given the large numbers of international students presently enrolled, the study additionally looked into why international hospitality management students chose to leave their home countries and why they decided to pursue a graduate degree in the US. Based on the findings, implications for hospitality administrators and faculty in the US and abroad are discussed and directions for future research are presented.

Keywords: hospitality management, graduate education, graduate hospitality student, international hospitality graduate student; graduate program choice

Introduction

The future of hospitality management education and research lies with its graduate programs, primarily those offering research-based M.S. and Ph.D. degrees. Students enrolled in these programs are the future professors and researchers of the field and will carry on the legacy of today's generation of academics who moved hospitality management education from its infancy in the fifties and sixties to its present-day stature of prominence.

In recent years, the field of hospitality management education has changed dramatically: there has been an increase in the number of hospitality programs in the U.S. and abroad and a dramatic growth in the level and volume of hospitality research (Ottenbacher,

Harrington & Parsa, 2009; Tsang & Hsu, 2011). The latter is exhibited by the increased number of hospitality management publications and the fact that several prominent hospitality researchers have moved beyond the field and made considerable inroads into the main stream literature such as business, psychology and marketing. An interesting example of how hospitality graduate education has grown in recent years is the Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism. The event grew from an informal get-together that was hosted by one university and attended by a handful of graduate students to a major conference attracting hundreds of graduate students and faculty and that is hosted and supported by all the major hospitality management programs (Van Hoof & Mattila, 2010). Besides its role as one of the two major venues for graduate hospitality students to present their research (the other being the I-CHRIE Annual Conference), the conference has gained prominence as the place where programs present job opportunities and where students market their personal and professional qualifications.

In contrast to information that is available on the status and growth of hospitality research, information on hospitality graduate programs, the suppliers of future research talent, is relatively scarce (Connolly & McGing, 2006; Enz, Renaghan, & Geller, 1993; Evans, 1990; Huang & Brown, 1996; Khwaja & Bosselman, 1990; Partlow, 1990) and this article attempts to address this by presenting an overview of US-based graduate hospitality programs. Of particular interest to the study were issues related to program composition (student gender and nationality), admission and graduation rates, graduate students' careers after graduation, financial support provided to students and the sources of those funds, program residency requirements, program length, program delivery methods and the specific features and qualities that distinguished one program from the next in the eyes of their administrators.

Research Objective

As stated the study was interested in generating an overview of research-based hospitality graduate programs in the U.S, those programs offering M.S. and Ph.D. degrees. Specifically, the study was interested in answering the following five questions:

1. What is the enrollment profile of a typical U.S. hospitality graduate program?
2. What are the admission requirements of U.S. hospitality graduate programs?
3. What kind of financial support is provided to hospitality graduate students?
4. What are the job opportunities for graduate students after graduation?
5. What do program directors consider to be the unique and distinguishing features of their programs?

Methodology

A questionnaire was developed for administrators of U.S.-based graduate programs offering M.S. and Ph.D. degrees. The programs were selected based on the most recent *Guide to College Programs in Hospitality, Tourism, & Culinary Arts* as published by International Council on Hotel, Restaurant, and Institutional Education (I-CHRIE). A review of this guide yielded a total of 31 U.S. based graduate programs which granted the M.S. (Master of Science) and/or Ph.D. (Doctor of Philosophy) degrees. The study excluded programs granting professional master degrees.

An initial draft of the survey was reviewed by experts and subjected to a pilot-test. After a review of the comments and some minor adjustments, the final version of the questionnaire consisted of four parts. Part one of the survey inquired about student enrollments in the M.S. and Ph.D. hospitality management programs. Part two looked into admission requirements. Part three contained several questions related to the graduate students' futures beyond graduation. The final part of the survey investigated the financial support that programs provided to their graduate students. A final, open-ended, question asked the respondents to identify what they perceived to be the unique identifying features of their programs. The questionnaire was then input into Qualtrics survey software for data collection.

After obtaining Institutional Review Board approval for the study, the administrators of the graduate hospitality programs were invited to participate in the study by personal e-mail. After the initial e-mail, a second, personalized reminder was sent out ten days after the initial invitation and a third reminder was sent out a week after that. To increase the final response rate, two of the researchers then called non-respondents to encourage them to participate. At the end of 2011, a total of twenty-seven program directors had completed the survey, yielding a response rate of 87.1%.

Findings

Program enrollments, admissions and graduation rates

Among the 27 programs that were part of the study, there were eight that only offered the M.S. degree, three that only offered the Ph.D. degree, with the remaining sixteen programs offering both degrees. Descriptive analysis showed that, among the programs granting M.S. degrees, there was a large variation in student enrollments. On average, there were about 60 M.S. students (Mean=60.2, Std. = 82.27) enrolled in U.S. based M.S. programs at the time of study. Those programs admitted 31 M.S. students (Mean=31.3, Std. =51.15) and graduated 20 M.S. students (Mean=20.3, Std. =26.88) annually. A closer look at the data found that the main reason for the unusually high variation in size among programs was the fact that the six largest M.S. programs had student bodies ranging from 100 to 346, whereas the five smallest M.S. programs enrolled only 2 to 10 students.

Among programs granting Ph.D. degrees, on average there were 14 students (Mean=13.9, Std. =11.90) enrolled at the time of study. Annually, programs admitted four Ph.D. students (Mean=3.9, Std. =3.10) and graduated 3 Ph.D. students (Mean=2.5, Std. =2.17) annually. There were five programs in the U.S. that enrolled more than 20 students, with sizes ranging from 22 to 42 students. The five smallest Ph.D. programs enrolled between 1 and 5 students (See Table 1).

Student Profiles: Origin and Gender

M.S. Programs

Of great interest to administrators is information on student demographics, specifically student origin (domestic vs. international) and gender (male vs. female). Across the M.S. programs domestic students made up 57% of the student body and there were considerably more female students (61%) than male students (39%) enrolled (See Table 2).

Because of the dominant position of the six largest M.S. programs their statistics were analyzed separately. It was found that within those six large programs domestic students made up 59% of the total student body and 41% of the students came from overseas. With regard to gender, the enrollments were 56% female and 44% male.

The study then re-examined M.S. program enrollments without the six large M.S. programs. Among the remaining smaller programs, 51% of the total student body was domestic and 49% was international. As far as gender was concerned, these programs reported that 70% of the total M.S. student body was female and 30% was male.

Table 1   Program enrollments, admissions and graduation rates

		N	Mean (Std. Deviation)	Min.	Max.
MS Program	Total Enrollment	24	60.2 (82.27)	2	346
	Annual Admission	24	31.3 (51.15)	1	250
	Annual Graduation	24	20.3 (26.88)	0	100
Ph.D. Program	Ph.D. enrollments	19	13.9 (11.90)	1	42
	Annual Admission	19	3.9 (3.10)	0	13
	Annual Graduation	19	2.5 (2.17)	0	7

Ph.D. Programs

The directors of the Ph.D. programs reported that 56% of their students was international and 44% of them was domestic. They also enrolled more females than males: 55% of the students were females and 45% were males (See Table 2).

Table 2   Student Profiles - Origin and Gender

MS Students in M.S. Programs	Domestic	57.3
	International	42.7
	Female	60.6
	Male	39.4
Ph.D. Students in Ph.D. Programs	Domestic	44.1
	International	55.9
	Female	55.0

Male	45.0

Program duration and residency requirements

M.S. Programs

It took the average M.S. hospitality management student less than two years (Mean=1.7) to finish his/her course work. Three-quarters (75%) of the M.S. programs allowed students to pursue their M.S. degrees on a part-time basis and 54% of the programs had some form of residency requirement, with 21% of all programs requiring full-time residency. Slightly more than half (54%) of the M.S. programs did not allow their students to take course work on-line.

Ph.D. Programs

Ph.D. program directors reported that it typically took their students close to 3 years (Mean=2.7) to finish their programs of study, with answers ranging from 2 to 4 years. Almost half (47%) of the Ph.D. programs allowed students to pursue their degrees on a part-time basis. A large majority of the Ph.D. programs (68%) had residency requirements for their students and 47% of the Ph.D. programs required full-time residency. A majority (68%) of the programs did not allow their students to take course work on-line.

Financial support to graduate students

MS Programs

A large majority of the M.S. programs offered partial (58%) to full (16%) financial support to their students. When asked specifically about the kind of financial support their students were provided, 70% of the programs responded that they provided some form of tuition waiver, 50% supported their students with cost of living stipends and 60% supported students with some travel support.

The study also asked M.S. programs to identify the sources of the financial support they provided to their students. Ninety percent (90%) of the programs reported using university funds as one of the sources, 85% of the programs identified research grants of faculty members as funding sources, 50% of the programs reported that their funds for student support partially came from endowments and 20% responded that the financial support came from industry support.

Ph.D. Programs

All of the respondents reported that they offered some kind of financial support to their Ph.D. students: 84% of the Ph.D. programs offered full financial support and 16% of the programs partially funded their students. When asked about the kind of financial support they provided their students, all of the respondents stated that that they provided tuition waivers, 84% supported students with cost of living stipends, 84% offered some travel support and 42% of the programs offered other kinds of financial support.

When asked about the sources of the financial support they provided to their students, 89% of the respondents reported using university funds, 84% of the programs identified using research grants of faculty members, 42% of the programs reported that their funds came partially came from endowments and 16% responded that financial support came from industry support.

After Graduation

MS Students

This study was particularly interested in determining student placements after graduation and asked the respondents to focus on their recent graduates in particular. The study found that 89% of <u>domestic</u> M.S. students had found jobs in the US, 4% had found jobs abroad, and 4% of domestic M.S. graduates had not found positions upon graduation. It was reported that 3% of the domestic M.S. graduates had decided to continue on to a Ph.D. program, either at their current university (2%) or at another university (1%) (See Table 3)

   Among <u>international</u> M.S. hospitality management graduates, 65% had found positions in their home countries, 20% had found jobs in US and 1% had found jobs in other countries. Slightly more than 3% of the international M.S. graduates had decided to continue on in the Ph.D. program at their current university, while 7% had moved on to a Ph.D. program at other universities , with about 5% of the international M.S. graduates not finding positions at all (See Table 3).

   When asked why the international M.S. graduates had returned home, the respondents suggested that they had returned because there were better opportunities in their home countries (33%), their visas had expired (22%), they could not find jobs in the US (17%) or for family reasons (11%).

Table 3:   Career Directions of M.S. Students after Graduation

<u>Domestic</u>

		%
Found jobs in the US		89.1
Found jobs abroad		3.8
Did not find a position		4.7
Continued on your Ph.D. program		1.8
Continue on Ph.D. program at another university		0.9
	Total:	100

	%
Found jobs in the U.S.	20.1
Found jobs in the home country	65.1
Found jobs abroad, not home country	0.5
Continued on in a Ph.D. program at another University	6.9
Continued on your Ph.D. program	3.2
Did not find a position	4.2
Total:	100

Ph.D. Students

As for Ph.D. graduates, almost all (95%) of the <u>domestic</u> students had found jobs in the US and 5% had found jobs abroad. This meant that there were no <u>domestic</u> Ph.D. graduates who had not found positions upon graduation (See Table 4), an important potential marketing tool for hospitality graduate programs.

Among <u>international</u> Ph.D. graduates, 48% had found jobs in their home countries, 35% had found jobs in the US and 10% had found jobs in other countries. Only 7% of the international Ph.D. graduates had not found positions (See Table 6). The international Ph.D. graduates who had gone home upon graduation had done so mainly because they preferred returning home (36%) or they had not been able to find jobs in the US (27%). Some had returned due to government contracts (18%) or because they had already secured jobs in their home countries (18%) prior to graduation.

Table 4:   Career Directions of Ph.D. Students beyond Graduation

Domestic

	%
Found jobs in the US	95.2
Found jobs abroad	4.8
Did not find a position	0
Total:	100

International

	%
Found jobs in the US	34.5
Found jobs in the home country	48.3
Found jobs abroad, not home country	10.3
Did not find a position	6.9
Total:	100

Unique Program Features

Finally, when asked what they considered to be the most unique feature about their graduate programs, only 5 out of the 27 program directors responded that it was faculty expertise. Seven respondents mentioned a strong industry connection as a distinguishing feature and six directors suggested it was a particular concentration that they offered. Other features that were mentioned more than once included location (3 programs), a strong Ph.D. cohort (3 programs) and the availability of an on-line program (2 programs).

Discussion

In looking at the results in greater detail, some interesting details came to light. The study found considerable discrepancies between the number of students admitted and the number of students graduating. At the M.S. level, the study found that U.S. hospitality programs admitted about 31 students a year and graduated an average of 20 students. Similarly, the respondents shared that they admitted 4 Ph.D. students every year on average, yet graduated only 3. The obvious question that arises here is: do 35% of the M.S. students and 25% of the Ph.D. students admitted not complete their degree requirements? Although these numbers compare favorably to national attrition rates for Ph.D. students in general of 50% or more (Council of Graduate Schools, 2007), losing about one-third of the graduate students to attrition still represents a tremendous waste of financial resources, human energy and intellectual effort.

In the M.S. programs, female students made up a majority of the student bodies (61% vs. 39%) and M.S. programs enrolled more domestic (57%) than international (43%) students. This enrollment picture was reversed in the Ph.D. programs with regard to student origins: the study saw more international (56%) than domestic (44%) enrollments. Yet, here too, there was a dominance of female students (55% female vs. 45% male).

It was important to see that almost all the Ph.D. graduates had found research/teaching positions, either in the U.S. or abroad, at a time when many universities were still trying to cope with the economic downturn and the ensuing budget cuts. All domestic Ph. D. graduates and almost all (93%) international Ph.D. graduates had found jobs. It was found that only 7% of international Ph.D. graduates had not found positions. Similarly, a large majority of M.S. graduates had found employment upon graduation. Of concern was the fact that very few M.S. students continued their studies at the Ph.D. level. Less than 3%

of <u>domestic</u> M.S. students and only around 10% of <u>international</u> M.S. students had continued their studies in their own or another Ph.D. program. Whereas many faculty members see the M.S. degree as a stepping stone to the Ph.D., most M.S. students apparently do not share that opinion and do not continue their graduate studies.

Limitations & Future Research

The study reported here had some limitations. First, the sample used in the study was derived from a subset of all hospitality graduate programs in the US: only those granting the research-based M.S. and Ph.D. degrees in hospitality management were included. The results cannot be generalized to the entire field of hospitality graduate education as many graduate programs have a professional rather than a research focus. Future research efforts can be focused on a comparison between professional and graduate hospitality programs.

The study only looked into programs that were U.S. based. Yet, as Formica (1996) suggested, the practices of hospitality education are very different across cultures. According recent ranking research of hospitality and tourism programs (Severt, Tesone, Bottorff & Carpenter, 2009), many high-quality hospitality programs are now located outside of U.S and future research efforts can be focused on an analysis of those programs and on a comparison of graduate hospitality education across cultures.

Moreover, it would be of great benefit to the field and to program administrators to determine how and why students choose one program and one university over others. More than a decade ago, Huang & Brown (1996) provided early insights into this topic when they looked into school choice, career expectations, and academic adjustment of first-year international graduate students in U.S. hospitality graduate programs; a continuation of that effort would be highly beneficial to the field. Similarly, as mentioned earlier, an investigation into graduate student attrition would be worthwhile.

Attrition rates in hospitality were lower than for graduate studies in the US overall, which was good news on the one hand, yet it also begs several other questions as to why that might be the case. Is hospitality graduation easier or less demanding? Are faculty members more engaged and more committed to making sure students complete their studies? Are hospitality programs perhaps attracting better or more dedicated students? Are the lower attrition rates perhaps related to the gender and nationality compositions on the program? All of these are interesting questions for future research as well.

Conclusion

Hospitality graduate education has grown dramatically in recent years and despite the recent cuts in university and program funding, new programs are still being developed. This study found that US-based hospitality graduate programs vary greatly with regard to duration, size, funding, education format, residency requirements.

In true hospitality fashion, program administrators around the country were very forthcoming in providing information about their programs and the researchers greatly appreciate their collaboration. Even though programs compete for the same highly-talented students, they are ultimately jointly responsible for the future of hospitality management education and research. It is a relatively small community and students educated at one

institution will become faculty members at another. The better these students are prepared, the better off all programs are.

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Loss of Electricity and Refrigerated Foods: Avoiding the Danger Zone

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Abstract

Recent events such as Winter Storm [Hurricane] Sandy and Hurricane Katrina have demonstrated that local food supplies must last as long as possible. Current recommendations are to dispose of all refrigerated food four hours after the power is lost. The purpose of this study was to determine if it is possible to safely hold food longer than four hours without power. The results indicate that the food can be held for up to six hours if the door is not opened. If ice is added to the refrigerator, then it will take the food approximately 10 hours to reach 5°C (41°F).

Keywords: refrigerated foods, danger zone, food safety

Introduction

Perhaps nothing reminds us of how vulnerable our food supply is as much as when disaster strikes. On October 29th, 2012 Hurricane Sandy hit New Jersey and much of the East Coast of the United States. Its effects were felt in 17 states, knocking out electrical power to more than 8 million homes and causing an estimated $25 billion in damages (Webley, 2012). Residents in New York and New Jersey were without power for weeks. On August 29th, 2005 Hurricane Katrina hit New Orleans, causing more than $81 billion in damages (Knabb, Rhome, & Brown, 2005). The residents who remained in the city stranded by flood waters were without food, water, or shelter (NOAA-NCDC, 2005). It does not take a disaster of the magnitude of Sandy or Katrina to disrupt an area's food supply. On August 14, 2003 residents of the northeastern U.S. and parts of Canada experienced a blackout when problems occurred with the power grid. In all, ten million Canadians and 45 million Americans were affected by the blackout. It took utility crews more than 48 hours to fully restore power to parts of New York and Toronto (Kile et al., 2005).

In each of these situations, large numbers of people were without electricity for days, sometimes weeks, on end. In these circumstances, it is not always possible for the government, whether federal, state, or local, to immediately 'come to the rescue' of all its citizens. Nor is it reasonable to expect that it should. Residents of any given area should be aware of what potential disasters could befall them, and prepare accordingly. For most, this means keeping a supply of water and food adequate to sustain them for several days or longer. This is, however, becoming increasingly difficult to do as we become more dependent on refrigeration (and its need for electricity) as a means for storing and preserving food.

Owners of foodservice operations face unique challenges during disasters. Foodservice operations typically store significant quantities of perishable food in their refrigerators, which could become a large financial loss if immediate steps are not taken to

protect it. Additionally, restaurateurs could potentially use their food as a source of disaster mitigation, provided that they can be sure that the food has been kept safe. When the power goes out without a back-up power source, the food has been effectively removed from temperature control. In accordance with the U. S. Food and Drug Administration (FDA) (2009) Food Code, food removed from temperature control can only be held for four hours. An exception to this rule would be if the food's temperature was below 5°C (41°F) when the power went out and the temperature never exceeded 21°C (70°F), then it can be held for no more than 6 hours. Neither time constraint will be of much help in the disasters described above. It is very important that temperatures below 5°C (41°F) for cold food storage be maintained as long as possible to provide safe food for those trapped by the disaster until help arrives. The first step to doing this is to understand the holding characteristics of refrigerators. This study looks at a commercial two-door reach-in refrigerator. The goal is to define its holding characteristics and develop guidelines for extending its ability to hold food below 5°C (41°F) for the longest time possible.

Literature review

The first step to safely holding cold food during a disaster is to understanding the need to keep food safe; in other words, what are we trying to protect it from? The short answer is microorganisms, in particular bacteria. Bacteria reproduce through binary fission, or cell division. The rate of reproduction depends in part on the ambient temperature, and at optimum temperatures most will reproduce every twenty minutes, although some can be as quickly as eight minutes (ICMSF 1996). This means that a single bacterial cell dividing every twenty minutes will produce over 4,000 cells in a four hour period, and over a billion after ten hours. It is therefore crucial to maintain temperatures that do not promote bacterial growth. Many of the most common bacteria of concern during a disaster are mesophiles (NRAEF, 2008).   While mesophiles prefer a range from 30°C (86°F) to 45°C (113°F), they can grow in temperatures as low as 5°C (41°F) (FDA, 2001). The top seven most commonly identified pathogenic bacteria caused 99.7 percent of all reported foodborne outbreak in 2007 for which the causative agent was confirmed (CDC, 2010). The top seven pathogenic bacteria, in order, were: *Salmonella* ssp., *Clostridium perfringens*, *Escherichia coli*, *Campylobacter* ssp., *Shigella* ssp., *Staphylococcus aureus*, and *Bacillus cereus*. The minimum growth temperature for this group of bacteria is 5°C (41°F) (FDA, 2001). For example, *Salmonella* spp does not grow at all at temperatures below 42°F (NRAEF, 2008); however, like most bacteria they do not die at low temperatures, rather they remain preserved and viable for long periods of time (USDA-FSIS, 2008), meaning that when the temperature becomes favorable they will resume the reproduction process. For this reason, the FDA (2009) recommends that food that has been removed from temperature control be disposed of after 4 hours. Therefore, the best way to protect people from foodborne illnesses related to those bacteria would be to maintain the food at temperatures below 5°C (41°F).

Properly functioning commercial refrigerators will maintain the proper temperature provided they have electrical power. In most disasters, electricity is not available unless provided by a backup generator. By surveying past disaster victims, Gerald (2005) determined that in Louisiana, hurricanes, which are the most common natural disaster affecting healthcare facilities, generally cause electrical power and natural gas services to be lost. Once power is lost, food temperatures in refrigerators will start to rise. There are many

factors that will affect how fast the temperature rises. To better understand of how heat enters the refrigerator and how it affects the temperature of the food, a brief discussion of the principles of heat transfer and the thermodynamic properties of foods is warranted.

The basic premise of heat transfer is that there is a driving force and a resistance. If the driving force exceeds the resistance, heat will be transferred. The equation that is used to describe overall heat transfer is $Q = A\Delta T/R$ (Geankoplis, 1983), where Q is the amount of heat being transferred, R is the resistance to the flow of heat through the refrigerator walls, A is the surface area of the refrigerator, and ΔT is the difference between the outside temperature and the temperature inside the refrigerator. The temperature difference is the driving force. The larger the temperature difference, the greater the rate of heat transfer and the greater the rate of temperature increase for the food within. While R is technically the term representing the resistance to heat flow, the area through which the heat is moving also affects the rate of heat transfer. Because of this, the surface area of the refrigerator (A) and the resistance to the flow of heat (R) can could be combined into a single term A/R that is effectively the resistance to heat transfer for the refrigerator. The larger the R-value of the refrigerator the greater the resistance to the flow of heat through its wall, the longer it takes for heat to enter the refrigerator and raise the temperature of the food. The R-value is primarily dependent on the type of insulation used and how thick it is. The standard per-inch R-values for refrigerators with a conventional steel outer shell, as accepted by the EPA, are as follows (Griffith & Arasteh, 1995): CFC blown foam, R-9.03; evacuated foam composite, R-11.14; gas-filled foam composite, R-9.71; evacuated-powder polymer barrier, R-18.80; and gas-filled polymer barrier, R-13.50. It is clear from these numbers that the vacuum designs (evacuated and gas-filled) provide for a superior R-value. However, the drawback of using these is that in the unlikely event of a puncture, the R-value drops to 3 or below.

The thickness of the wall and the surface area of the refrigerator also impact the rate of heat transfer. The thicker the wall the greater the resistance to heat flow. For example, if the wall thickness is doubled then the resistance to heat transfer will also be doubled, and the rate of the temperature increase of the contents of the refrigerator will be cut in half. The impact of the surface area can be equally as important. Since the shape of most commercial refrigerators is roughly the same, it is the ratio of the surface area to the volume within that is important. As the size of the refrigerator increases, then the area to volume decreases, as does the relative rate of heat transfer. For example, a one foot square cube has a surface area of six square feet and a volume of one cubic foot. If the size of the cube was increased so that each side measured two feet, then it would have a surface area of 24 square feet and a volume of eight cubic feet. The resulting ratio of surface area to volume would drop from 6:1 to 3:1. For that reason larger refrigerators are generally more efficient than smaller ones.

While the R-value for the materials that makes up the walls of the refrigerator are well documented, that is but one of the components of the overall R-value for the refrigerator. The overall R-value for the refrigerator is impacted by the seal around the door(s) and the resistance to heat transfer related to convection between the air and the walls of the refrigerator. Both terms present problems when trying to calculate the overall R-value for the refrigerator theoretically. The convection component is particularly difficult to theoretically estimate. Typically, ranges for convection coefficients found in many engineering handbooks can be quite wide, with the high end being two or more times as

large as the low end (Geankoplis, 1983). For that reason, the rate of heat entering a refrigerator is best estimated experimentally.

The rate of heat entering the refrigerator is only one of the factors that impacts the rate food temperatures will increase; the other is the food itself. As heat enters an object such as food in a refrigerator, the rate of temperature increase of that food depends on the heat capacity of the food and the mass of food. The rate of change in temperature of the food can be defined by the following equation: $Q = C_pM(T_{t+\Delta t} - T_t)$ (Geankoplis, 1983). Just as with the heat transfer equation, Q is the amount of heat moving into the food. The heat moving into all the food in the refrigerator is approximately equal to the amount of heat entering the refrigerator. The heat capacity of the food is represented by C_p. The higher the heat capacity of the food, the more energy (heat) it will take to raise its temperature. Foods are typically compared using specific heat rather than heat capacity. Specific heat refers to the ratio of the heat capacity of a substance to that of water; since it takes one calorie to raise one gram of water one degree Celsius, confusing the two terms does not lead to numerical errors (Harper, 1976). For most food materials, the specific heat of the non-water portion is approximately 0.5. As water is generally the major constituent, little error is caused by using the constant value of 0.5 (Harper, 1976). Examples of the specific heat of foods include: nuts (specific heat 0.28), beef and pork sausage (0.56), beef flank (0.56), and chicken (hens, 0.65) (Singh & Heldman, 2001).   M in the previous equation is the mass of the food in the refrigerator; the greater the mass contained in the refrigerator the longer it will take the temperature to rise. When C_pM are combined you have the thermal mass of the food in the refrigerator. The final set of terms, $(T_{t+\Delta t} - T_t)$ represents the actual increase in the temperature of the food after a set time (Δt).

With a basic understanding of the theory behind why the temperature of food in a refrigerator rises when the power goes out, it is possible to look at ways to delay the temperature rise of the food in the refrigerator. The first thing to look at would be slowing the rate of heat entering the refrigerator. Based on the heat transfer equation, this could be done one of two ways: increase the resistance to heat flow or decrease the driving force. Wrapping the refrigerator with insulating material would increase the resistance, but since most insulation is porous this could create some serious sanitation issues. Decreasing the temperature difference could be accomplished by reducing the temperature of the air in the room containing the refrigerator. Since a loss of power will affect the operator's ability to keep the kitchen cool, this approach also has problems. For this study, the focus for delaying the temperature increase was instead placed on the thermal mass of the food in the refrigerator. The goal of this study was to develop some guidelines for reducing the rate of temperature increase of the food in a refrigerator during a disaster by adjusting the thermal mass. The thermal mass was adjusted either by increasing the amount of food in the refrigerator or adding ice.

Methodology

This experiment was designed to determine how long after a loss of electrical power it takes for food to enter the 'temperature danger zone' (above 5°C, 41°F). Specifically it looked at how the mass of food contained within and the addition of a known amount of ice affects the time it takes for the food to enter the danger zone. For this study, water was

used to simulate food. Water was chosen for several reasons: it is cost effective, homogeneous, and its physical and thermal properties are well documented.

The time necessary for food to reach the temperature danger zone could vary by location of the food within the refrigerator. Food located on higher shelves could reach warmer temperatures sooner (warm air rises), and food further away from the door (in back) could remain colder longer (Laguerre et al., 2007). In addition to front-to-back, the distance from the side wall may also impact the rate of temperature rise. Therefore, shelf and location information was collected. The temperature difference between the food and the room is the driving force behind heat transfer, and therefore both temperatures were recorded. The amount of food contained within the refrigerator affects the thermal mass and was also recorded. For example, less energy (heat) is needed to raise the temperature of one cup of water by one degree than is needed to raise the temperature of one gallon of water by one degree. Finally, the starting temperature of the food was recorded for each trial.

Two variables were controllable as to their effect and were the treatments applied to this experiment. The two controllable variables were load level and the addition of ice. Load had three levels: full, 36 (12 per shelf) one-gallon milk jugs with filled with water for a total weight of 132 kg; two-thirds full, 24 (8 per shelf) one-gallon milk jugs with filled with water for a total weight of 88 kg; and one-third full, 12 (4 per shelf) one-gallon milk jugs with filled with water for a total weight of 44 kg. The addition of ice had two levels (ice added or ice not added). When ice was added, it was added in form of 14 (7 each on the top and middle shelves) half-gallon milk jugs each filled with 1.55 kg of ice for a total weight of 21.7 kg. To complete a full-factorial design, six iterations of the experiment were necessary.

The location of the water and ice jugs is shown in Figure 1. For the two-thirds full trials, Jugs 5 – 8 were removed from each shelf. For the one-third full trials, Jugs 2, 4, 5 – 8, 9, and 11 were removed from each shelf. When ice was added the placement was the same for all three loads of water.
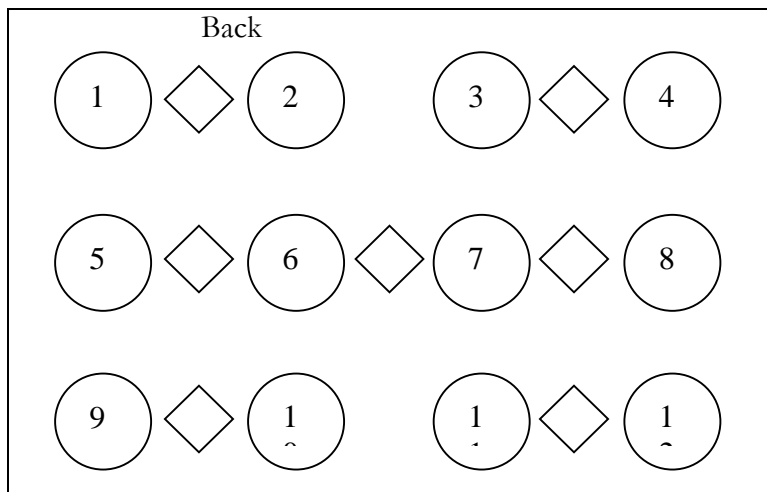
Figure 1. Placement water and ice containers. The water containers are shown as numbered circles and the ice containers are shown as diamonds.

       To measure the water temperatures, three Picolog TC-08 digital thermal recording devices with k-type PTFE-insulated probes with PTFE coated tips were used. A total of 20 probes were used to measure the water temperature. To measure the air temperature, three general purpose air probes were connected to one of the TC-08 meters. The water probes were attached to the outside surface of the water containers, at the midpoint vertically and horizontally on the side of the containers. Probes were connected to all the jugs in the front and back rows (Jugs 1-4 and 9-12) on the top and bottom shelves and Jugs 1, 3, 10, and 12 on the middle shelf. One air probe was placed outside the refrigerator to measure the room temperature and the other two were placed inside. One was placed in the center of the refrigerator even with the top shelf, and the second was placed in the center of the refrigerator even with the middle shelf. To estimate the rate of heat transfer into the refrigerator, it is important to know the temperature of all jugs in the refrigerator. Because of the number of probes available, it was not possible to measure the temperature of all jugs in the refrigerator for the full load trial. The temperatures of the jugs without probes were estimated based on the temperature of the other jugs on the same shelf.

       The refrigeration unit used for this experiment is similar to many used in the foodservice industry. The refrigerator is a seven-foot (84.5 inch exterior height) two-door reach-in with three shelves and an interior capacity of 49 cubic feet. Made by McCall (model 4-4045), the unit's cabinet body, doors, and evaporator coil housings are insulated with pressure-injected (blown) polyurethane foam.

       For all tests, the appropriate numbers of water jugs were place in the refrigerator and allowed to sit for 24 hour with the refrigerator running to equilibrate the jug temperatures. The test started with the unplugging of the refrigerator and continued for 24 hours with temperatures being recorded each minute for all probes. For the trials with no ice added the doors were not opened during the entire testing period. For the trials with ice added, the doors were opened one hour after the refrigerator was unplugged to add the ice; the doors were not opened again for the remainder of the trial.

       Data were analyzed using backward stepwise regression and the seven independent variables were analyzed for the full model. They were Shelf (top, middle, or bottom), IceNoIce (whether or not ice was added), Load (132 kg, 88kg, or 44 kg), Row (whether the container was in the front or back row), Side (whether the container was next to one of the side walls or not), TempOut (the ambient room temperature), and StartTemp (the starting surface temperature of the water container). All variables were analyzed as categorical variables with the exception of the starting temperature of the containers, load, and the dependent variable; the number of minutes to reach five degrees Celsius (41°F).

       To determine the best set of predictors (load, shelf, position front-to-back, position side-to-side, ambient room temperature, and starting temperature of the water) of the time it takes for food to reach 5°C (41°F), backward stepwise regression was used to analyze the data. The regression analysis was performed using SPSS version 16.0.

Results and Discussion

The average temperatures of the different trials are show in Figure 2. The figure clearly shows the impact of the load and the addition of ice. The spike in temperature at the one hour mark for the trials where ice was added was due to opening the door to add the ice. Because the sensors were attached to the outside of the containers, they showed an increase in temperature greater than that experienced by the product as a whole. Both increasing the volume of food and adding ice effectively increase the thermal mass of the contents of the refrigerator. As expected, as the thermal mass increases the rate of temperature rise decreases. Another factor that is clearly evident is the inherent harmonics of the sensing instruments.

Recorded temperatures fluctuated, making an accurate assessment of jug temperature difficult. As the noise recorded (generally about 0.25°C) was within the range of accuracy of the recording devices (1°C), it was decided that the data would be smoothed. The recording harmonic fluctuations cycled approximately every 40 minutes, the smoothing of the data was accomplished by using a moving average; each data point was re-coded as the mean temperature readings from the 20 minutes prior to the point through those 20 minutes after the point. The resulting data was considerably more linear, allowing for a more accurate assessment of temperatures and at what point 5°C (41°F) was reached. If the fluctuations still occurred at the 5°C (41°F) mark after smoothing the data (crossing 5°C, fluctuating lower, then crossing above the temperature a second time), the second data point was selected as the minute that the temperature was reached, because from that point on the temperature stayed at or above 5°C.
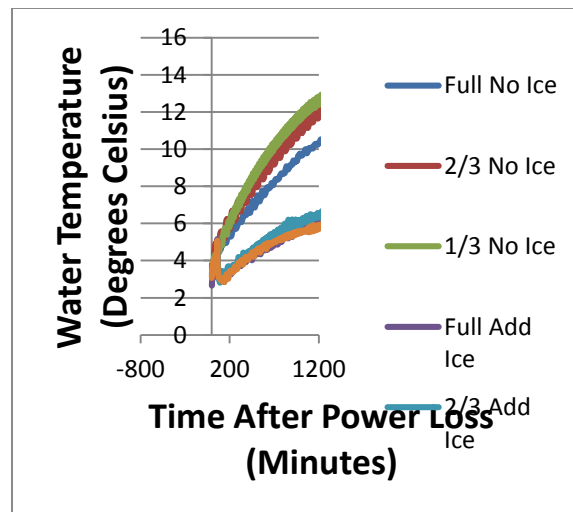

Figure 2. Water Container Temperatures After Loss of Power with No Addition of Ice Versus With Addition of Ice at Minute 60

Backward stepwise regression was run to determine the best explanatory model for this experiment. The dependent variable was the amount of time (in minutes) it took for the

water containers to reach 5°C (41°F). The independent variables were the seven variables described previously. As the outside room temperature and the starting temperature of the containers are both scales, they were treated statistically as continuous variables. The mass of the water contained within the refrigerator was entered in kilograms, and was treated as a continuous variable. The addition of ice, the shelf, positioning front or back, and position in proximity to side walls were all treated as categorical variables. The addition of ice and both positioning variables only had two levels each. Shelf had three levels, and was therefore modified by the creation of two dummy variables (number of levels minus one) during the statistical analyses to account for all three levels.

The results from the backward stepwise regression returned five models. The ANOVA table of the final, reduced model shows that the independent variables reliably predict the dependent variable (F=170.419, Sig.=0.000). The variables in the final model were top shelf (Shelf 3), the middle shelf (Shelf 2), addition of ice (Ice), and the starting temperature (StartTemp). The model was: time to 5°C (41°F) = 802.675 - 127.473(shelf3) + 80.127(shelf2) + 359.151(IceNoIce) - 184.109(Starttemp). As was expected by preliminary examinations of the data, the position side-to-side and front-to-back on a shelf did not impact temperature change when the door was closed. Two variables were mysteriously missing from the model: the room temperature and the amount of food in the refrigerator. Theoretically both variables should have been significant.

The reason why volume of food was not significant was that its effect was masked by the addition of the ice. The thermal mass of the ice was great enough to negate any impact from the varying levels of food in the refrigerator. When the load (amount of water) was regressed against time to 5°C (41°F) in the absence of the other variables it was significant. The same was true when it was run without the ice variable. This demonstrates the importance of adding ice to a refrigerator once the power goes out no matter how much food it contains.

The effect of the room temperature may also have been masked by conditions of the study. The temperature of the room was controlled and did not vary by more than 3°C (5°F). Additionally, the trials with the one-third loads had the lowest room temperatures. This means that the driving force (temperature difference between the room and the inside of the refrigerator) was smaller for those trials than for the other trials. This could have served to lessen the effect of both the room air temperature and the amount of food inside the refrigerator.

Conclusion and Implications

It is clear from Figure 2 that for the conditions tested as part of this study that disposing of all food in the refrigerator after fours may not be warranted. Even for the trials with no ice the temperature did not reach 21°C (70°F). Based on FDA (2009) rules for holding food, the food was safe to serve for up to 6 hours. The trials where ice was added maintained temperatures below 5°C (41°F) for approximately 10 hours. Combine this with the previous 6 hour FDA rule, and this could mean at least one, possibly two, additional meal periods could be served from the food before it needs to be discarded.

While not specifically tested as part of this study, it appears that the rate of heat absorbed by the ice changed over time resulting in an increase in the temperature of the food. Twenty-four hours after the power to the refrigerator was turned off there was still ice left in the refrigerator. Clearly, the ice lost its cooling power and needed replacing before it had all melted. It would appear that if the ice is replaced every 4 hours then the temperature would remain below 5°C (41°F) indefinitely. This leads to an important question: Where will the restaurant operator find ice in the middle of a disaster? The answer may be closer than one would think: the walk-in freezer. If there is enough warning the walk-in could be filled with containers of water that will freeze and provide the source of ice for some time. If there is no warning then other things in the freezer could serve basically the same function as ice. Frozen meat and vegetables could be placed in the refrigerator and serve much the same function as ice. As those items thaw, they can be removed, cooked, and served to the victims of the disaster.

It appears that with proper management it is possible to maintain safe food much longer than the recommended four hours (FDA, 2009). This is important to restaurateurs as they could potentially prevent significant financial losses. Additionally, knowing that their food was safe to serve, they could assist in mitigating the disaster by helping to feed the victims, especially if cannot leave the area and fresh supplies cannot be brought in for several days, as was seen in the aftermath of Hurricane Katrina.

To confirm the findings and develop more uniform parameters more studies in this area are needed; in particular, to overcome some of the limitations of this study. It is important to note that this experiment was conducted using one specific refrigerator. The unit was in good working order, and the door seals were in good repair. The results of this study can only apply to refrigerators that identically match the one used for this study, with similar environmental conditions. Limitations of this study included only using one type of refrigerator, having a relatively steady room temperature, and only using ice as the cooling medium. Future studies need to look at other types of refrigerators and environmental conditions. It is unlikely that the temperature of the room housing the refrigerator will remain constant during a power outage. In addition, future studies should look at adding different amounts of ice and at varying intervals. The behavior of other cooling medium such as frozen food and dry ice also needs evaluated. Finally, for this study the door remained closed for the entire time. The impact of opening the door to remove food for serving needs to be evaluated.

Finally, it needs to be emphasized that the point of this study was not to disprove or contradict FDA recommendations for maintaining food safety. Rather the goal was to augment existing information, and determine means for protecting food as long as possible.

The results of this study determined measures to extend the safe life of food using the FDA criteria for safety.

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Hotel guest e-questionnaires: implications for feedback and relationships

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Abstract

This paper examines the reliability and efficacy of hotel guest e-mail questionnaire compared to the paper questionnaire in the Asian Pacific context. Conducted in Perth, Singapore and Penang, cities with mature hospitality and tourism industries and a representation of chain and independent deluxe hotels, this exploratory qualitative study examines hotelier views of e-mail guest communication derived from content analysis of guest questionnaires format and content and in-depth interviews with senior hoteliers. The findings indicated that e-questionnaires manifested as e-mails, as a direct replacement of the paper questionnaire, appear to be premature given divergent hotelier views and shortcomings in e-mail response administration. If properly executed, e-mail can play an increasingly important adjunct role to the paper guest questionnaire as a part of a multi-channel approach. The balance/relationship between 'high tech' and 'high touch' needs to be maintained: the latter can enhance the latter but should not undermine it.

Keywords: hospitality, service quality, relationship, guest questionnaire

Introduction

The guest questionnaire is a hotel tradition and the mainstay of guest feedback elicitation in use by mainstream hotels. The literature shows hoteliers to have widely embraced e-mail as a communication tool (Murphy et al, 2003; Wei et al, 2001)**;** and there appears to be an emergent trend of it superseding the traditional, paper-based channel of guest-hotel communication. While prior studies in this area have primarily been of guest-to-hotel e-mail response quality (Pechlaner et al, 2002; Schegg et al, 2003, 2006; Matzler et al, 2005), this paper addresses hoteliers**'** views on two-way e-mail guest communication. It also explores relationship-building between hotel and guest by examining and comparing the cues contained

in paper and e-mail hotel guest questionnaires which encourage guests to provide feedback via paper, e-mail or hotel/chain website.

Guest communication in the hotel industry

The importance of communication in the hotel industry, given its characteristic people-centricity (Lewis and Chambers, 1989; Schneider and Bowen (1993) in Cheng and Brown, 1998; Thompson and Abbott, 1990) and high contact service setting (Bitran and Hoech, 1990) is widely acknowledged: effective internal and external communication is key to efficient day-to-day operations, and has long-term managerial implications (Garrett and Meyers, 1996; Susskind, 2001). Hotel-to-guest communication typically occurs via Marketing Communications (Gilbert et al, 1999) and during hotel employees' interactions with guests.

Guest-to-hotel communication mostly occurs when guests communicate with front-of-house staff, but also, traditionally, by way of guest questionnaire (also known as a 'comment card'). Hoteliers purport to place high importance on guest communication per se and the widespread use of guest questionnaires is reflected in the literature (Banker et al, 2005; Barsky and Labagh, 1992; Heung and Lam, 2003; Pullman and Cleveland, 2004; Tordjman, 2004; Wisner and Corney, 1999). The paper-based guest questionnaire would appear to be obligatory, given its ubiquitousness - guests expect to find a questionnaire in their guestrooms (Chipkin, 1999). It is a tool with which "the hotel industry is familiar" (Barsky and Labagh, 1992, p. 40) despite criticisms of low response rates (Dillman, 2000; Gabbie and O'Neill, 1996; Gundersen et al, 1996; Lewis and Chambers, 1989; information yields that often cannot provide actionable feedback for managers (Barsky and Nash, 2001; Gundersen et al, 1996; Jones and Ioannou, 1993); and poor representativeness (Barsky and Nash, 2001; Heymann and Schall, 2002; Lewis and Pizam, 1981; Meyer and Westerbarkey, 1996).

E-mail: a customer interface

Murphy et al (2007, p. 743) underscore the popularity of e-mail in the hospitality industry providing "a unique opportunity for personalized and intimate interactions with guests, thus enhancing *customer relationships*" (italics added); however they suggest its application by hotel operators is unsophisticated. Nevertheless, large hotel chains, such as Hilton and Marriott, have been reported in the press as phasing out paper questionnaires and surveys in their North American properties, replacing them with e-mail based derivatives (Alexander, 2006). Their action suggests they believe the technology is proven and the most hotel guest is receptive to it. This uptake is likely to be buoyed by reports that extol the virtues of e-mail. For example, two commercial studies on the effectiveness of e-mail communications found it to be an effective marketing tool (Nelson, 2006). Grönroos et al (2000, p. 250) highlight the interactive nature of e-mail which, as a major part of the communication element of the Internet offering, "illustrates the dialogue that can occur between the service provider and the customer". This dialogue, according to Schegg et al (2003), can be facilitated in hotels by websites and e-mail. Apart from a customer interface function, e-mail also provides opportunities for marketers to create and maintain dialogue with customers (Grönroos et al, 2000; Newell, 2000).

Other studies, however, indicate the pace of uptake to be varied. In Turkey, Aksu and Tarcan (2002) found the dedicated e-mail channel for guest complaints to be in its infancy;

and similarly in Switzerland, Frey et al (2003) discovered variability at the implementation stage. Murphy et al (2006) found that the sophistication of e-mail application by Swiss hotels is also variable.

Changing of the guard: paper to e-questionnaire

Susskind (2006) found in his study of communication-channel preferences of restaurant guests that written communication directed at management (letter, e-mail or web) was preferred over questionnaire/comment card to convey a complaint, suggesting the migration to e-questionnaires may be underpinned by a perception that the virtual variant is more effective than the traditional paper counterpart. However, studies have shown e-mail responses to be ineffectual (Murphy and Tan, 2003; Schegg et al, 2003), and operationalization deficient (Canadian Broadcasting Corporation, 2007; Fux et al, 2006; Schegg et al, 2006). This indicates the need for an assessment of the question: how do hoteliers at the property level perceive e-mail communication with their guests in terms of proactively obtaining guest e-mail addresses and utilizing them as part of their managerial modus operandi? This is particularly pertinent given that technologically sophisticated guests are generally more demanding, requiring an immediate response via e-mail (Mattila and Mount, 2003). This resonates with recent findings that timeliness is a key element of the customer's attitude toward the hotel, leading to customer satisfaction and establishing customer loyalty (Jones et al, 2007; Zehrer and Pechlaner, 2006). According to Alexander's (2006) newspaper article, fast response was the underlying reason for Marriott to switch to e-mail. Tardy or inconsistent e-mail response would therefore be off putting guests who may wish to volunteer feedback. As a consequence, a hotel would potentially lose the opportunity to seize upon negative critical incident knowledge that would mitigate switching behaviour in guests (Colgate et al, 2007). Notwithstanding the limitations of the static service-encounter-based variant of the critical incident technique (Roos, 2002) applying to paper and e-questionnaires, these tools continue to be relevant and useful to hotel management.

Hotelier-Guest Relationships

Hoteliers use the term 'relationship' to characterise an interaction between the customer and the service-providing employee (King, 1995; King and Garey, 1997). Price and Arnould (1999) show the parochial usage of the term relationship to be confounding, while McColl-Kennedy et al (2003) assert it is subjective, due to the variations of relationships available to consumers. Hoteliers continue to use the generic term despite its complexity (Louvieris et al, 2003). Literature directed at operators (Gutek 1995, 1997; Gutek et al. 2002; Magnini and Honeycutt Jr., 2005) indicates the need to differentiate between the different 'relationships' occurring between customer and service provider. Perhaps the use of the term has been perpetuated by the media as demonstrated by a declaration made by a travel industry pundit that e-mail is a facilitator of customer relationship (Hareveldt in Sharkey, 2003).

Roos (2002), however, points out, that relationships between customers and service providers extend beyond face-to-face encounters, as new technology has been increasingly used to control and support service encounters. Relationships, pseudo-relationships, encounters and enhanced encounters apply to the hotel industry (Gutek, 1995, 1997; Gutek et al, 2002). More recently, Riley (2007) notes that 'relationship encounters' is a tourism and

hospitality phenomenon. Therefore, the question arises: is a relationship in hotels a misnomer? The frequent posting movement phenomenon by hoteliers, especially those with hotel chains (Clark, personal interview, 2005; Al-Bala'a, personal interview, 2007), strongly suggests such hoteliers not to have relationships per se, but rather enhanced encounters or 'commercial friendships' (Price and Arnould, 1999).

Notwithstanding the semantic issues, Lin's (2007) study of customer satisfaction in Taiwan used a comprehensive perspective serving to highlight the importance of the interaction between service provider and customer. He found the interpersonal-based service encounter to be better than the technology-based service encounter in functional quality; while the technology-based service encounter is better than the interpersonal-based service encounter in technical quality. He also found functional quality has a positive and significant effect on customer satisfaction; service quality has a positive and significant effect on service value; and service value has a positive and significant effect on customer satisfaction. Therefore the service encounter has a positive and significant effect on relationship involvement; and relationship involvement has a positive and significant effect on customer satisfaction.

There has, however, been no indication that hotels in Asia Pacific have followed the path taken in North America in the matter of the continued widespread use of paper guest questionnaires. Given that e-mail evaluation is in its infancy (Murphy et al, 2007), it was appropriate to conduct an exploratory study in the Asia Pacific region on the uptake of this emerging trend. The objectives were:
1) To explore hotelier attitudes toward e-mail as a communication channel with guests;
2) To determine if hoteliers elicit guests' e-mail addresses in their existing paper questionnaire and, if so, is this a prelude to engender subsequent e-mail communication; and
3) To discuss to what extent e-mail communication between the hotelier and guest engenders a "relationship".

Methodology

Two methods were used to achieve the objectives:
a) Content analysis of hotel questionnaires used by hotels in Perth, Penang and Singapore obtained by convenience sampling ($n = 71$) to ascertain guest e-mail information gathering initiatives via prompts and/or data fields. Selection criteria included:
   1. Hotel category which was high to mid-range in accordance with the World Tourism Organisation model of minimum hotel standards (cited in Lawson, 1995);
   2. Target respondents (guests staying in the hotel);
   3. Placement of questionnaire (in-room: situated anywhere within the confines of the guestroom); and
   4. Principal language (English).

The primary researcher made 'cold calls' at hotels and requested from the Front Desk personnel an in-room guest questionnaire, that is the questionnaire provided to guests who are registered and staying at the hotel. If a hotel placed more than one questionnaire in the

guestroom and the items were not duplicates, both questionnaires were included in the sample. Food and beverage outlet questionnaires intended for diners and city guests were not collected. The sampling was not random so the findings are not generalizable.

b) GM interviews conducted in Perth, Penang and Singapore (*n* = 22) to explore hotelier attitudes toward e-mail communication with guests and efficacy in complaint handling. Access to the respondents was through personal contacts of the primary researcher. Criterion purposive sampling was used to overcome the anticipated unavailability of respondents due to the peak holiday season. The selection criteria were as follows:

1. General Manager or Hotel/Property Manager position. If unavailable, the Executive Assistant Manager (EAM), Rooms Division Manager (RDM), or Front Office Manager (FOM) would be acceptable if suitably qualified.
2. Employment at a 3-star rated hotel or above.

Results of Content Analysis

The analysis of the cues in the pro-forma content of the questionnaires notifying guests that e-mail communication was available using prompts or solicitation of guest e-mail addresses revealed:
a) Variable attitudes towards e-mail data collection; and
b) Variable usage of e-mail according to hotel affiliation (independent versus chain).

a) Variable attitudes towards e-mail data collection

Half (50.7%) of the sample (n=71) had a dedicated guest e-mail field in the questionnaire. In contrast, 80.3% contained a standard mailing address field while 40.9% had a telephone number field. This data suggests that, while some hoteliers considered e-mail as a viable mode of hotel-to-guest communication channel, it had not been fully embraced across the board at that time (2005). Further, although some questionnaires did not contain a mailing address field, they did prompt the guest for a room number which would have allowed the hotelier to trace such details from the mandated, hotel property management system guest history collected at guest registration. Data such as e-mail address, however, is discretionary and optional. One hotel did not solicit the e-mail field as a direct communication link per se, but as a means to distribute their 'e-mail special offer updates'. Only five questionnaires (7%) contained a fax number field indicating a general abandonment of old technology. While hoteliers would appear to discard old technology readily, they seem less ready to adopt new technology, contradicting the observation made that global hoteliers were quick to embrace e-mail demonstrating their attitudes to be synchronous with the pace of information technology (Wei et al, 2001).

Of the sample, only 26.8% had provided their hotel e-mail address on the questionnaire, thereby indicating that, while hoteliers may consider e-mail as form of hotel-to-guest communication channel, they do not accord the same viability to it as a guest-to-hotel channel. This sits well with the findings of Luck and Lancaster (2003) which showed that hotel groups in the UK used the Internet to provide information to, rather than to gather information from, their guests. While the hotel would be able to respond to an e-mail from a guest simply by

using the 'reply' function of its e-mail application, it did not facilitate or encourage a guest to e-mail feedback in lieu of using the paper questionnaire. Further observations appeared to show a random approach to the utilization of e-mail:

- Of those questionnaires that appeared to solicit guests' e-mail addresses (*n = 34*), 38.2% contained the hotel e-mail address. It can be surmised then that, among those hoteliers who find the e-mail a viable way to contact their guests, some do not necessarily consider this form of communication as a viable one for their guest to contact the hotel.
- A few hotels (*n = 5*) provided their e-mail addresses on their questionnaires without soliciting the guest e-mail address. This suggests some hoteliers may wish to provide a guest with the option of contacting the hotel by e-mail and therefore be seen as reactive rather than proactive in establishing an e-communication link.
- An e-mail address, (privacy@examplehotelchain.com) was provided by one hotel from a large international chain, allowing guests to contact the chain with any queries regarding data confidentiality of the questionnaire/survey; therefore it was not intended to solicit guests' e-mail addresses for purposes of initiating communication or to respond to non-privacy related enquiries.

The data show e-mail addresses provided by the hotel relate mostly to:

1) Room Bookings (e.g. reservations@hotelx.com;stay@examplehotelchain.com), and
2) General Information (e.g. info@hotely.com; hotelz@examplehotelchain.com; emailus.country@examplehotelchain.com; country@examplehotelchain.com).

One hotel did not indicate to whom the e-mail should be directed**,** but clearly identified the location and chain (am@city.examplehotelchain.com.au), while another incorporated only the first three letters of the hotel name and the chain name in its e-mail address (pen@xyzhotels.com.sg). One chain hotel questionnaire used a general manager-specific e-mail address (gm@examplehotelchain.com.sg) which would be directed to the incumbent general manager, but this was property specific and unique because questionnaires belonging to sister hotels did not apply this convention. Therefore, in all, with one exception, no attempt was made to forge a direct link with the hotelier, indicating its perfunctory role. The conclusion to be drawn is that hotels wish to foster a pseudo-relationship with their guests, further evidenced by inadequate e-mail addresses and website domain name matching (Hashim and Murphy, 2007). The practice of permitting variations in chain hotel e-mail addresses between and within brands may suggest an attempt to create differentiation which may overcome the impersonality associated with an inflexible corporate identity. The motivation for this differentiation could be an attempt to foster a closer association with guests within different market segments. However, it might just indicate a casual attitude towards e-mail communication. The possibility of using the general manager's direct e-mail, although operationally impractical, cannot be discounted even though it is questionable that a logistical issue would outweigh the benefits of personalization (Schaefer and Dillman, 1998).

Given the tendency for customers to view "individual service providers erroneously as if they are the organization" (Wollard and Rocco, 2006), it would seem appropriate that hotel general managers would want to establish a clearly definable contact within the hotel for guests to e-mail for matters other than room reservations, particularly concerning complaints.

b) Variable usage of e-mail according to hotel affiliation (independent versus chain)

The findings indicate a disparate attitude toward e-mail between chain and independent hotels. Of the 26 questionnaires with dedicated guest e-mail fields, eight belonged to independent hotels (23.5%) with the remainder being either managed or franchised chain hotels. Both large and medium/small chains appeared to demonstrate an equal tendency to obtain e-mail data from guests.

The following can be surmised from the data:

- Chains are more inclined to communicate with guests via e-mail. This may be due to the resources possessed by a large organisation allowing for data management. This practice, however, may reflect the chain ethos but not necessarily represent that of the franchisee.
- The usage of e-mail is a chain characteristic, irrespective of the size and type of chain.
- Independent hoteliers may be slow in the uptake of e-mail as a guest-to-hotel communication channel. This slow uptake could be due to the mindset of the hotelier vis-à-vis technology (Rowe and Ogle, 2007). The link between hotelier predisposition to technology and technology output is furthered by the argument of Winata and Mia (2005) that the use of information technology for communication (ITC) enhances inherent management processes and decision styles in an organisation, thereby insinuating ITC adoption is highly dependent on the mentality of the manager. Pechlaner et al (2002) report that hoteliers' attitudes toward the Internet impacted on the type of e-mail response.

GM Interviews

The in-depth interviews revealed diversity in hotelier attitudes towards e-mail as a vehicle for hotel-guest communication:

a) General inclination to use e-mail evidenced by no less than 15 respondents who stated unequivocally they had and would use e-mail to communicate with guests. The willingness to use e-mail, however, might not be wholehearted, as one respondent said:

> ….*not a lot of people actually put their email address on there… but if they have bothered to put an email address on there, I would suggest that the thought was that they were expecting an email…*(Respondent # 17).

b) Increased e-mail traffic with guests as emphasized by respondent # 3:

> *Quite a lot of people put their email address these days so it's generally one of the two (e-mail and telephone)… very rarely do I actually mail a letter these days.*

c) The impersonal nature of e-mail, respondent # 5 declaring that, notwithstanding having used telephone and e-mail responses, *due probably to my age, I still feel e-mail is a little bit impersonal still… I still prefer the written letter.* This sentiment was shared by respondent # 17 who, while maintaining that *a proper document with a letterhead on it is most probably the way to go*, grappled with *what is the difference between a letter and an email… a letter is generated again on a typewriter or from a computer, it is not as if it is the days when somebody actually sat down and wrote by hand.*

d) Technological issues:

Some conservative hoteliers may not be entirely comfortable using new technology due to its impersonal connotations; therefore they present with adoption issues compatible with the perception of a tendency for resistance to change in the industry, with some members being the last to adopt new technology. Lam et al, (2007) suggest that hotelier mindset influences the uptake and adoption of IT; therefore, if the hotel manager is uncomfortable with the technology, the possibility exists of a 'trickle down' effect. Hotelier conservative attitudes may not be reflective of personal views on technology but rather, as respondent # 10 implied by saying his mother *still writes letters – there are millions of people in the world who are still like that*, which is indicative of guest attitudes toward technology.

Murphy et al, (2006) recently exhorted hoteliers to "establish and train (their) staff on email policies" although the necessity of basic e-mail procedures was previously identified (Murphy et al, 2006; Schaefer and Dillman, 1998). A lingering discomfort with e-mail usage felt by some hoteliers remains, despite it being widely available since the mid-90s (Wei et al, 2001), and considered a guestroom amenity (Shundigg, 1997; Wolchuck, 1997). Could this be attributed to a concern that the inclusion of an e-mail field on the paper questionnaire would create clutter or be a garnish?

Relationship

Two respondents referred to the term 'relationship' during the course of the interview. One respondent indicated that a relationship was a longer term interaction thereby indicating an appreciation for the definitional distinction between service encounter and relationship, but apparently not as further discrimination between relationship and pseudo-relationship:

> To *me it's all about relationship building and that relationship is built over perhaps not so much as always on an official basis…. on a casual basis, we get to know the people a little bit better* (respondent #10)

The respondent, however, implied personal relationships to be important in the hotel industry, and that he would *invite people in for dinners,… do entertaining, correspondence through e-mails, etc.*

This appears to contradict the view of one respondent that relationships with guests could be problematic when lamenting that *becoming too closely attached* (can manifest in) *some customers* (to) *start bullying the staff* (respondent #6).

One respondent underscored the importance of commercial friendship by stating *what I believe what makes you comfortable is if you know the guy that is there. You know the GM or the FOM or the concierge or the housekeeper or something, then everything else is a lot easier to follow* (Respondent # 20) so countering the pseudo-relational orientation of the sampled questionnaires.

Conclusion

E-mail communication is widely embraced globally as shown by studies such as that on Swiss SMEs (Schubert and Leimstoll, 2004) and Australian travel agencies (Vasudavan and Standing, 1999). According to Werthner and Ricci (2004), the tourism industry is the leading application in the business-to-consumer (B2C) arena. Based on the findings of this study, the hotel sector would appear to lag behind the other sectors in highlighting the B2C orientation of e-commerce in the treatment given to e-mail communication. This appears to contradict the findings of a study by Wei et al (2001) of international hotel executives which found 97.5%

of hotels at which the respondents worked to use e-mail; and also e-mail to be commonly used for contacting guests (66.1%).

A bandwagon effect apparently occurs in the hotel sector concerning the uptake of e-mail as a primary method of hotel-guest communication, given recent studies show poor quality in feedback. This concurs with the view of Murphy et al (2003) who contend hoteliers have been party to the internet bandwagon effect, with some not fully realizing the potential of e-mail as a business-communication tool, despite hosting websites.

Questionable efficacy of e-mail-based communication channel as a platform for relationship building is noted. **'**Relationship', in the context of the hotelier lexicon, is the interaction between hotelier and guest, and may not constitute a relationship per se, or as defined by Gutek and Welsh (2000) as interactions involving situational adaptation, mutual trust and knowledge, and an expectation of continuity. The degree of relationship is not clearly distinguished in the hotel industry, being commonly used interchangeably with service encounter. Perhaps this occurs because the distinction between the two becomes blurred as it could be in "boundary open" transactions which Arnould and Price (1993) describe as those "resembling a meeting between friends", commonplace in the hotel context. Given the cynical view from a customer perspective, the relationship may actually be spurious (Liljander and Roos, 2002) with companies "pretending it's a relationship" (Gutek and Welsh, 2000, p. 3). A perception is thereby connoted that the actions taken by the establishment are mercenary, manipulative and plastic, requiring a concerted effort to project genuineness being paramount. This cannot be undermined by initiatives that could be considered impersonal or mechanical; these surely further eroding the tenuous relationship which the hospitality industry strives to develop. What appears to be a notion of relationship occurs between the service provider, in this case the hotel chain or a hotel as a business entity, and the customer, viz the guest.

However in some cases, a personal relationship which can be described as a compound bond of social, cultural, ideological and psychological aspects (Liljander and Strandvik, 1995) may form between hotelier and guest, becoming long-term, despite career movement attributable to the use of chain domain e-mail addresses, provided the individual hotelier remains with a particular chain. Hence the relationship extends beyond being centred on relational benefits, such as special treatment (Gwinner, Gremler and Bitner, 1998) accessed when a guest 'knows' the hotel general manager.

The adoption of the e-questionnaire as a direct replacement of the paper questionnaire can arguably be premature given the indicators that: response mechanisms are in their infancy, the disparate hoteliers' attitudes are ambivalent, a uniform convention on e-mail etiquette is deficient, and the intrusion of legality issues (Mills, Clay and Mortensen, 2000). It would appear that, although the hotels sampled had, similar to that noted by Frey et al (2003) in their study of Swiss hotels, gone beyond the initiation phase of having websites and e-mail, there had been marginal movement toward the implementation phase by which time policies governing operational administration should be in place. This delayed implementation is untenable, given that the procedure consists of the "seemingly simple task of answering e-mail(s) promptly, politely and personally" (Frey et al, 2003). E-mail, despite its lack of maturity as a guest communication channel, if properly executed, plays an important function as an adjunct to the paper questionnaire, and as a component of a multi-channel approach (Schijns, 2004).

The small sample of questionnaires and GMs represents the main limitation of this paper thereby necessitating a cautious approach in making generalisations of e-questionnaires in Asia Pacific hotels. The findings suggest the adoption of e-questionnaires as a direct replacement of the paper questionnaire is premature given divergent hotelier views and shortcomings in e-mail response administration. However, if properly executed, e-mail can play an increasingly important adjunct role to the paper guest questionnaire as a part of a multi-channel approach.

Future research

A longitudinal content analysis of hotel guest questionnaires would reflect the extent of change in hotelier acceptance of e-mail as a hotel-guest interface. Further data gathering is needed to investigate response mechanisms in the event of property rebranding, property closure or key personnel change. Sample responsiveness by applying the EMSQ model (Murphy et al, 2007b) to determine the effect of the 'warmth' factor on feedback elicitation and relationship building should be tested.

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