Current and Future Technology Use in the Hospitality Industry (May 2008)

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Current and Future Technology Use in the Hospitality Industry

American Hotel and Lodging Association (AH&LA)

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Executive Summary

In mid 2007 the Technology & E-Business Committee of the American Hotel & Lodging Association (AH&LA), in an attempt to identify the technology information gaps for its hotel operations membership, embarked on a survey of its members. The committee members submitted potential questions for the study and as a result of this collaboration a draft survey was presented to the committee at its November, 2007 meeting. In early 2008 with the help of students and faculty from the William F. Harrah College of Hotel Administration at the University of Nevada, Las Vegas, the email survey was launched. This report describes the results of that survey.

The purpose of this research was to survey the membership of the AH&LA, specifically its hotel operators, to determine its level of knowledge of currently available information technology (IT) systems, gauge the understanding of future IT requirements in the hotel industry, and gain an understanding of the IT needs of the hotel industry in the near term. Approximately 6,000 surveys were distributed via email and 244 responses were received. This equates to a response rate of about 4.1%.

The respondents were primarily mangers (61%) and directors (11%) of hotel operations (81%) with more than ten years experience in the industry (76%). They represent mainly mid-range (61%) and luxury (23%) hotels. The ratio of independent (46%) to chain (54%) properties was roughly equal.

A survey was chosen to obtain a broad sample of AH&LA members, because it was the most effective method of data collection. The email survey provided researchers with faster data collection times and more geographic flexibility with virtually no costs. With other target groups this method might be limited if the respondents are not skilled in using computers or email software or if they regard the survey email as spam. However, since the participants were AH&LA members, most of whom deal with technology issues as part of their jobs, the limitations of an email survey were mitigated.

The important statistical findings can be summarized as follows:

- There was overwhelming agreement that IT is important for;
    - Increasing employee efficiency (79.9%)
    - Increasing customer satisfaction (82.4%)
    - Generating revenue (71.3%)
- There was no agreement on whether technologies or systems contribute as engines for lowering expenses.
- More than 50% of the respondents identified "enhancing customer experiences" as an important near term IT goal.
- Approximately 40% of the respondents identified revenue generation as an important near-term IT goal.
- Respondents could not agree on whether IT would benefit back-of-house (BOH) systems more than it would enhance customer experiences; over 40% expressed no strong opinion on the matter.
- According to the respondents, Wi-Fi services were, by far, the IT system that they believe customers most care about (82%).
- In-room entertainment systems and provision of airline check-in kiosks were cited as important to customers by 48% and 38% of respondents, respectively.
- Hoteliers felt that they have met these previous two customer needs in proportion to perceived concerns: 86% of hotels responding reported offering Wi-Fi, 36% reported offering airline check-in kiosks, and 47% offered in-room entertainment.
- Wi-Fi and in-room entertainment systems should be nearly universal within five years; 20% of respondents not currently offering Wi-Fi plan to offer it within the next five years and 31% plan to offer in-room entertainment within five years.
- Chain properties and properties targeting business travelers are more likely to use and plan to use self-service technologies than other types of properties.

Regarding operational improvements facilitated by IT:

- Two-thirds of respondents reported that they had a branded hotel website.
- Over 70% reported using the internet and Wi-Fi networks to improve operations.
- Nearly half reported using on-line purchasing systems.
- Nearly 40% stated that they use energy management systems. Another 28% of respondents expect to be using energy management systems within the next five years; therefore we expect the use of these systems to be ubiquitous in the near term.

Regarding IT security:

- IT system security was seen as a large concern, with two-thirds of respondents naming it as one of the most important issues in the near future.
- About half of respondents also expressed concern over their ability to interface with existing systems.
- Low return on investment of IT systems was a common perception.
- The concern with security was also evident in the fact that over 95% of all respondents had at least one IT security system in place with over 90% using anti-virus systems and three-fourths or more using hardware and software firewalls.
- Properties with IT departments are more likely to use and plan to use a wide array of information system security systems.

Other significant results:

- Compared to those properties with IT departments, those without their own IT departments believed to a significantly greater degree that IT systems would not improve BOH functions more than the customer experience in the future (Table 23).
- Comparing properties that outsource at least some IT resources, those who were outsourcing agreed that IT had played an important role in lowering expenses over the last five years (Table 24).
- Those respondents who felt their IT budgets were sufficient reported that they felt IT to be far more important for enhancing customer experiences than did those whose IT budgets were not perceived as sufficient.
- The survey results indicate that IT is seen by hotel operators to be very important for the purposes of increasing employee efficiency, enhancing the customer experience, and generating revenue.

Review of Important Literature

The purpose of this research was to determine the level of knowledge of currently available information technology (IT) systems, to gauge hoteliers' understanding of future IT requirements in the hotel industry that can benefit hotel management professionals, and gain an understanding of the IT requirements of the hotel industry in the near future. During the past decade, IT has significantly changed the way the lodging industry plans, controls and manages operations. For example, the hotel industry is beginning to utilize kiosks and other self-service technologies (Carlin, 2007). Use of self-service technologies in the hotel industry has grown considerably, especially in the areas of self check-in, in-room check-out, and foodservice kiosks (Kasavana, March 2005). Between 2005 and 2006, mangers' belief in the importance of kiosks for their business increased by 8% (Carlin, 2006). Hotel managers have come to expect benefits from this technology in the form of enhanced customer services and operational efficiency.

Wireless technologies have also experienced an unprecedented growth despite the rising concerns about security issues (Kasavana, November 2005). Some of the most significant IT applications involve the use of mobile handheld devices, such as personal digital assistants (PDA), tablet PCs, and cellular phones. Additionally, one of the most common wireless technologies impacting the hotel industry is Wi-Fi. This allows hotel customers to access the Internet from a bar, restaurant, lobby or guest room (Bentley, 2005). Gatner Group reported that hotels remained the leading Wi-Fi hotspot locations in the world with more than 60,000 sites (Boehmer, 2005). Scholars expected that by 2007 wireless technology and related applications would be ubiquitous and would impact hotel service delivery, cost containment, and the overall customer experience (Singh & Kasavana, 2005).

In order to offer a variety of payment options, some hotel managers have adopted cashless payment systems via the use of radio frequency identification (RFID). RFID utilizes computer chips and antennas, allowing the chips to wirelessly communicate with a receiver. In the hotel industry RFID systems are being integrated with POS systems to process credit card and debit account transactions (Kasavana, March 2004). Some hospitality companies even accept biometrics, such as fingerprints, iris scans, facial scans or hand geometry analysis systems to increase physical or data security.

The area of in-room entertainment has seen dramatic improvements in recent years. This is in no small way attributed to the rapid growth of consumer technology. Not so long ago the level of in-room entertainment options in hotels was limited. In the past, most guests were willing to accept this because entertainment options themselves were limited. However, today's consumers have multiple entertainment options at their finger tips. Many hotel guests have come to think of their hotel room as a home away from home (Paret, 2004). As such they expect hotels to offer at least the same level of options for entertainment as they have at their homes. This increasing level of guest expectations has brought about a surge of methods for integrating consumer entertainment technologies into hotel rooms (Beldona, & Cobanoglu, 2007). As such the number of technological devices being utilized in hotels rooms for guest entertainment is becoming increasingly diverse.

As the use of technology has increased, so have the risks associated with it. One study reported that the most common threats to IT systems were virus attacks (71.4%), insider abuse of net access (57.1%), laptop theft (42.9%), and spoofing (39.3%) (Cobanoglu, 2007). In order to protect themselves as well as their guests from potential threats hotels are utilizing a variety of security options. The most widespread line of defense used by most hotels is anti-virus software (91.9%), followed by hardware and software firewalls (74.3% and 73.0%, respectively). In addition, a significant portion of hotels (68.5%) also utilize some form of physical security (Cobanoglu & DeMicco, 2007).

Based upon the multiplicity of IT applications utilized in the hotel industry it would be beneficial to be aware of the level of knowledge and understanding hotel operators have of these applications. It would also be of benefit to be able to determine areas in which hotel operators believe IT is meeting the operators' expectations and the areas where it needs improvement. By finding the gap between what hoteliers expect of various technologies and their level of knowledge regarding those systems, this research will help the Technology and E-Commerce Committee of the AHLA to provide pertinent information to help support hotel operators in making better decisions in terms of selecting proper IT applications for business success.

Results

Respondent Profile

The respondents were experienced hoteliers with more than ten years experience in the industry (76%). They were primarily mangers (61%) and directors (11%) in hotel operations (81%), although 21% identified themselves as owners, CEOs, or presidents of their operations (Tables 13-15). The properties they work for were mainly mid-range (61%) and luxury (23%) hotels. The ratio of independent (46%) to chain (54%) properties was roughly equal (Tables 16-17).

Fifty-three percent of respondents reported that they were with chain hotels that would be considered mid-range properties with an average of 175 rooms (range 3-3,000, median 107) (Tables 16-17). Figures 1 through 3 show the demographic breakdown for the respondents. Additional data is shown in the appendices of this report (Tables 1-21).

Figure 1: Job Titles (n=241)

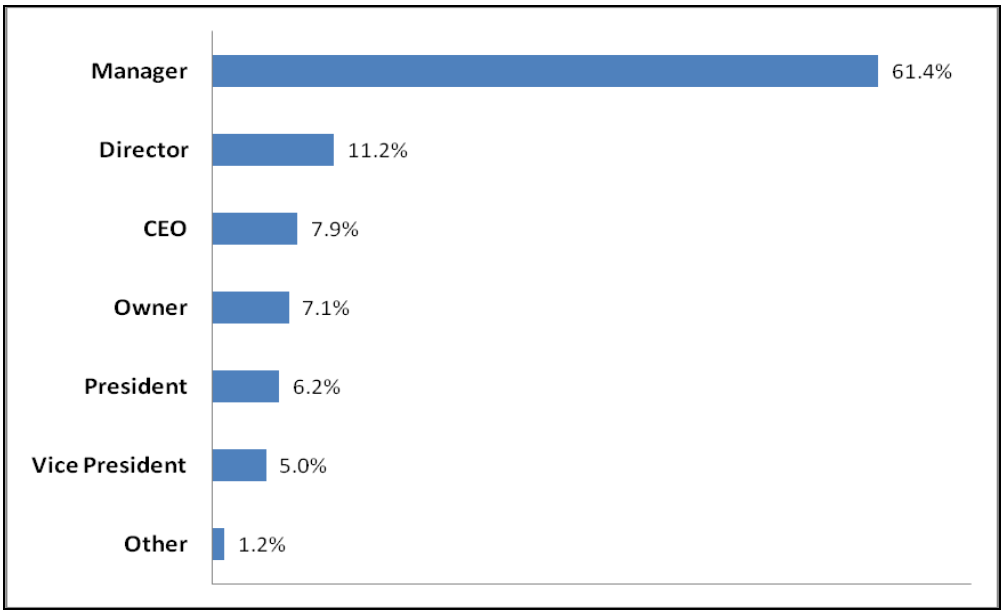


Figure 2: Respondents' Department (n=222)

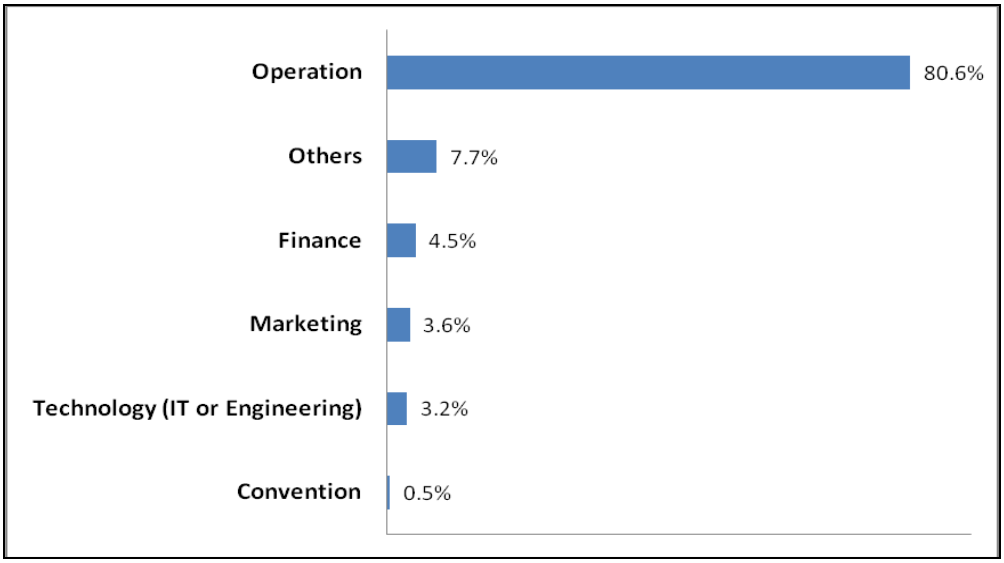
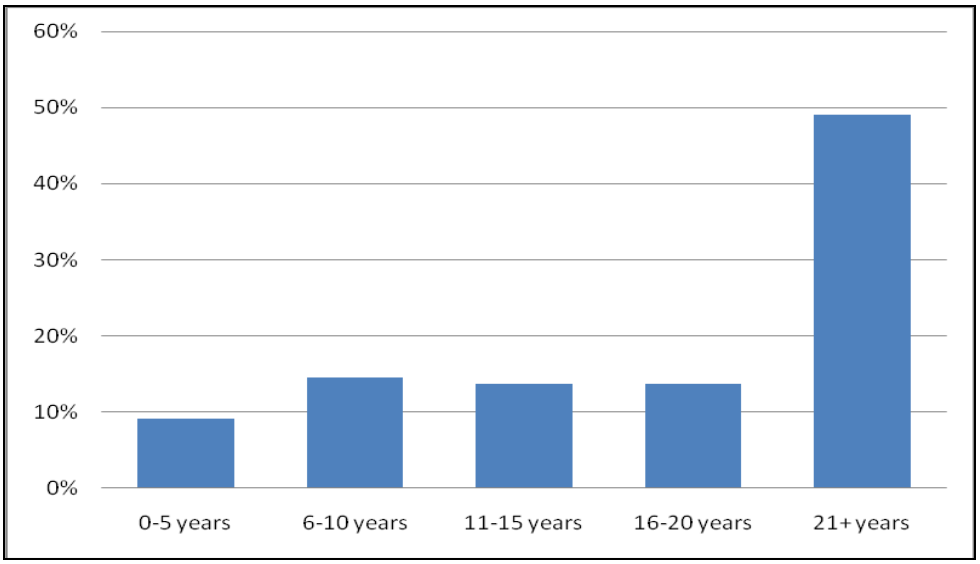


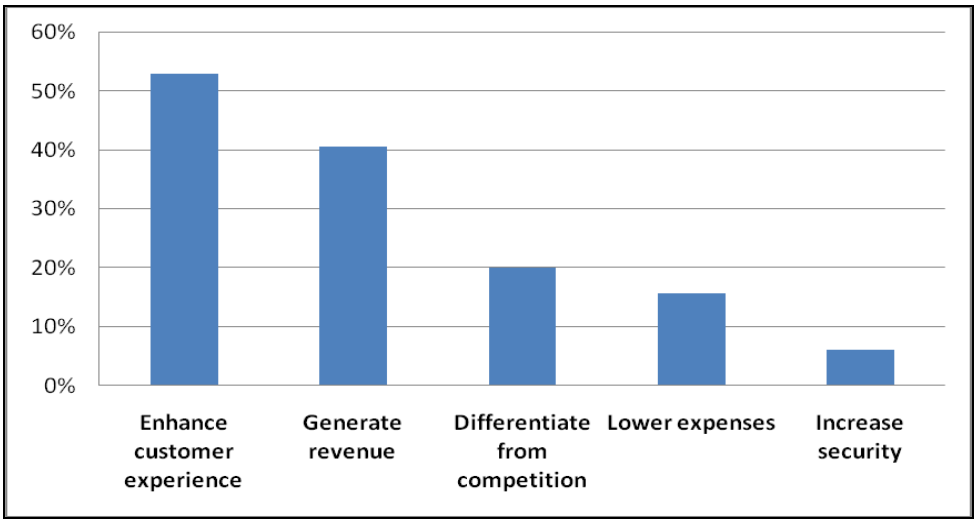
Figure 3: Number of years working in the industry (n=241)



Technology Goals

Figure 4 shows the goals for technology that hoteliers identified as important during the next five years. Fifty-three percent of the respondents (n=244) thought the most important goal for hotel technology over the next five years would be enhancing the customer experience. This was shown to be a shift in belief over the previous five years. The second identified goal was to use technology to help generate revenue (41%), followed by the ability of technology to differentiate properties from their competition (20%), lower expenses (16%), and increase security (6%). Three respondents believed all of these goals were important. Other goals included increasing efficiency, integrating more departments and procedures, and development of back office software for smaller properties.

Figure 4: Most important IT goals next 5 years

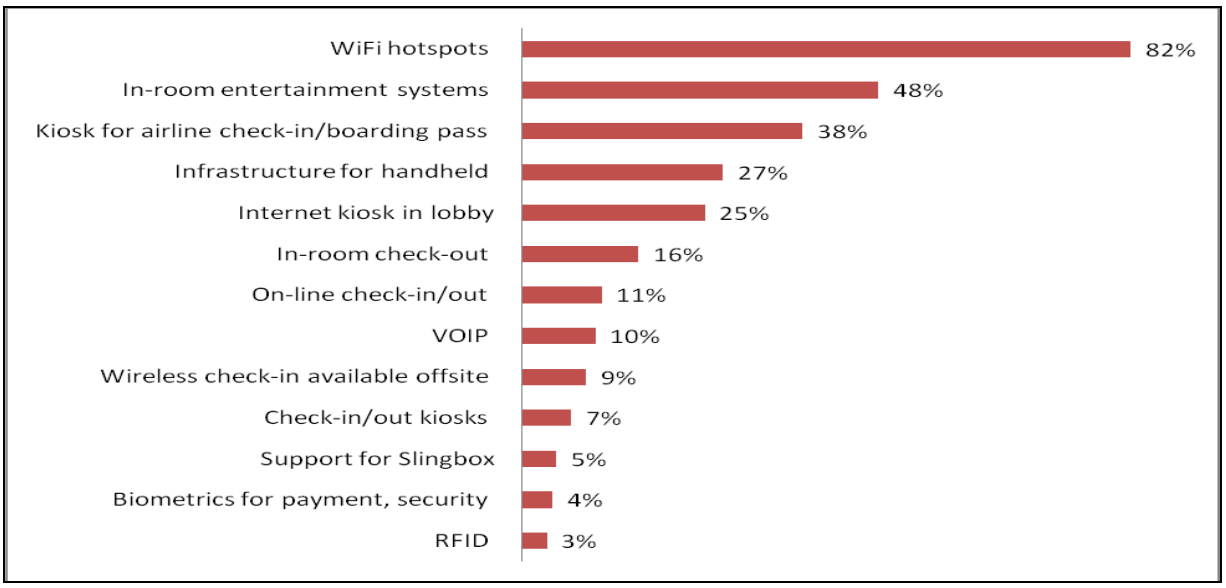


Enhancing the Customer Experience

The most important goal identified by the hoteliers was to use technology to enhance the guest experience. When asked which technologies they believed that customers most care about, Wi-Fi hotspots were named most frequently (82%, n=244), followed by in-room entertainment systems (48%), kiosks for airline check-in and boarding pass printing (38%), infrastructure for handheld devices (27%), and Internet kiosks in the lobby (25%). Figure 5 shows the most common technologies identified, however the following technologies were also mentioned as

important: reservations, on-line reservations, temperature/environment controls in rooms, secure DSL and Wi-Fi, on-demand (or tank-less) water heaters, and free wireless throughout the hotel.

Figure 5: Hoteliers' perception of the technology customers most care about



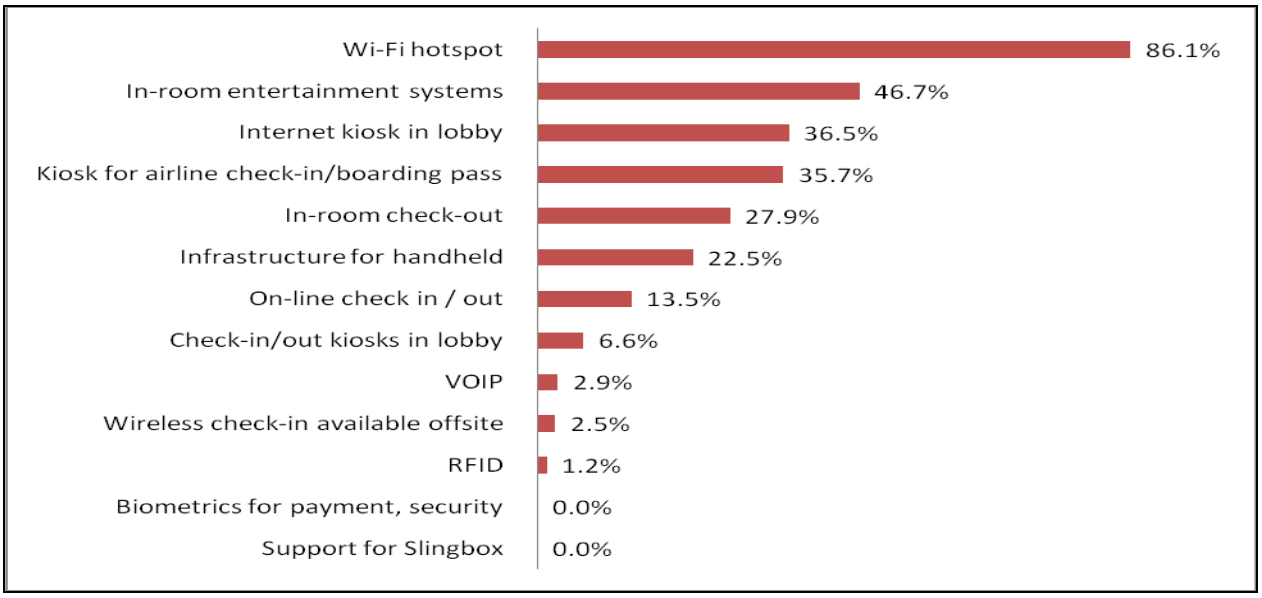
The importance of some of these technologies was reflected in the technologies currently in place in many properties. Wi-Fi hotspots were the most frequently offered guest service technology (86.1%, n = 244), followed by in-room entertainment systems (46.7%), Internet kiosks in the lobby (36.5%), and kiosks for airline check-in/boarding pass printing (35.7%) (Figure 6). Some respondents were offering in-room check-out and online check-in/out (27.9 % and 13.5%, respectively). Other reported technologies were: online reservations, temperature control in room (e.g., gas fireplace and A/C), customized profiling on an individual basis, laptops to borrow, lobby computers with Internet access and printer, on-demand (or tank-less) water heaters, free wireless and hardwire Internet connection throughout the hotel, LCD TVs, fitness centers and business centers, iPod docking stations, biometrics for staff members' time and attendance records, and business centers with free computers, printers and fax machines.

Wi-Fi was of equal importance to chain hotels and independents and the current installation of this technology reflects that belief with 87% of the chain hotels and 84% of independent hotels reporting that they have Wi-Fi installed. With regard to kiosks for airline check-in/boarding passes, hoteliers from chain properties were more likely to think that their

guests care about these kiosks than respondents from independent properties (Table 44). This finding was supported when examining current installations of kiosks for airline check-in/boarding passes with 65% of chain properties and 35% of independent proprieties reporting that they currently have this technology installed. In addition chain properties are currently more likely to offer check-in/out kiosks in their lobby, online check-in/out, in-room check-out, and internet kiosk in lobby as opposed to independent properties (Tables 45-49).

Additional analysis of the hotels that specifically target business travelers found that they currently are more likely to offer on-line check in/out, in-room check-out, and kiosks for airline check-in/boarding pass printing as opposed to properties that do not target business travelers (Tables 54-56). These services are consistent with the type of amenities and convenience factors that business travelers prefer.

Figure 6: Percentage of properties currently offering each technology

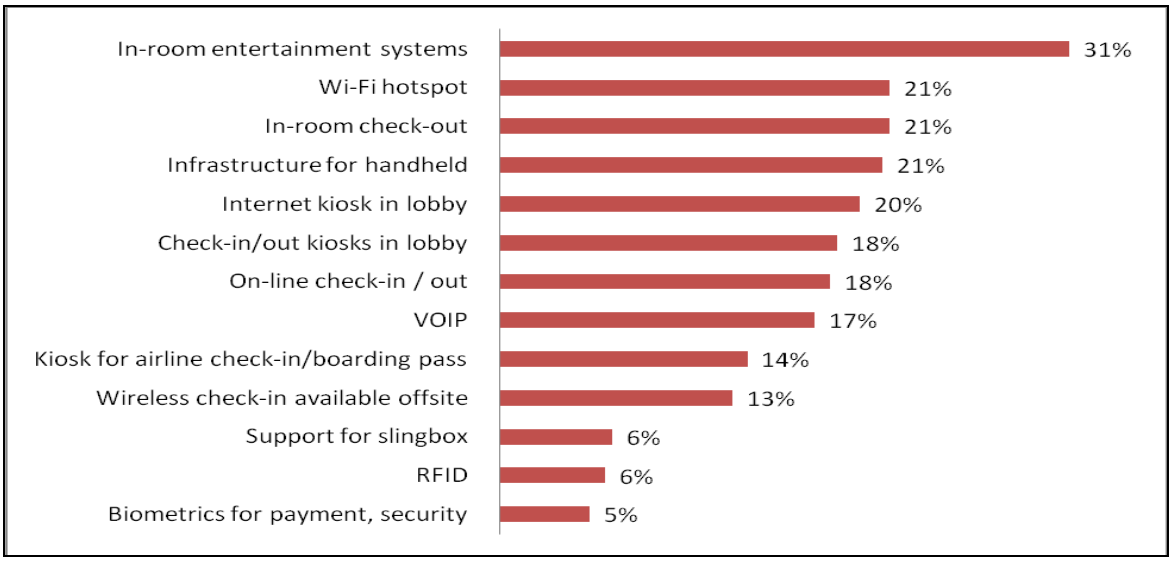


When looking at technologies that are planned to be implemented within the next five years (Figure 7), in-room entertainment systems were the first on the list (31%, n=244), followed by Wi-Fi hotspots, infrastructure for handheld devices and in-room check-out (21%, per category), and check-in/out kiosks in lobby and on-line check-in/out (20% and 18%, respectively). Other planned technologies were: Internet reservations, in-room temperature controls, two-way web-based property management systems, food and beverage services from

TV, Internet or phone, a wider array of entertainment access in rooms, multi media connectivity of personal devices, and business centers with free computers, printers and fax machines.

Again, looking at the difference between independent and chain properties the previous trend continues. Within the next five years more chain properties, not currently offering these services, plan to offer check-in/out kiosks, in-room check-out, and kiosks for airline check-in. (Tables 50-52) When looking at properties that target business travelers as opposed to those that do not it was found that properties which specifically target business travelers are more likely to have plans to offer check-in/out kiosks, and airline check-in/out kiosks (Tables 57-58). As previously mentioned these services are consistent with the preferences of business travelers. It was also found that properties that target families are more likely to have plans to offer check-in/out kiosks than properties that do not specifically target families (Table 60). These findings suggest that properties see these types of technologies as investments that will be necessary in the future.

Figure 7: Percentage of properties planning to offer each technology within 5 years



Operational Issues

The next three "most important IT goals" listed by the hoteliers after enhancing the guest experience have a common theme. Operational goals for IT include technology to generate revenue, lower expenses, and differentiating one property from another.

About 80% of the respondents (n=244) answered that technology was important for increasing employee efficiency in their operations. However, none thought that technology was not important. Seventy-one percent considered that their existing technologies have significantly contributed to generating revenue during the last five years. However, a few (13%) believed that technology did not contribute to revenues. In terms of lowering expenses, 30% believed that installed technology had played an important role during the last five years; 24% responded that it had not. But many of the respondents (46%) had no strong opinions regarding their technology's impact on lowering expenses (Figures 8-10).

Figure 8: Importance of technology for employee efficiency

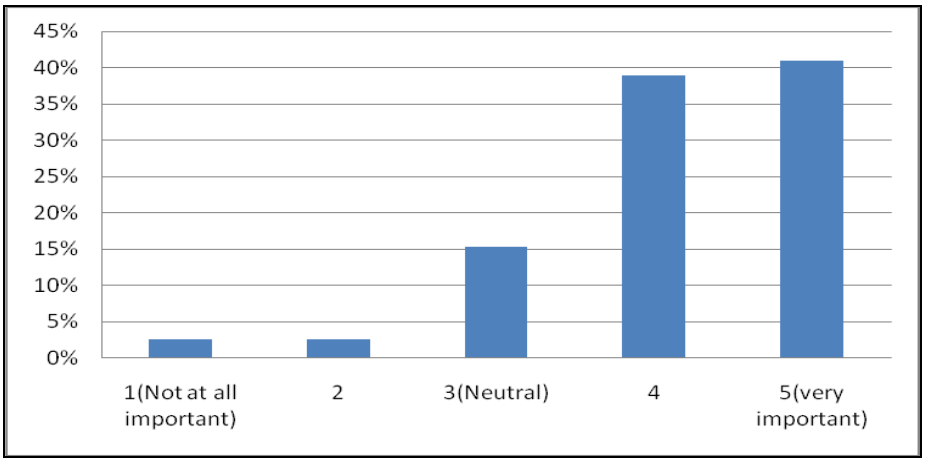


Figure 9: Importance of installed technology for generating revenue last 5 years

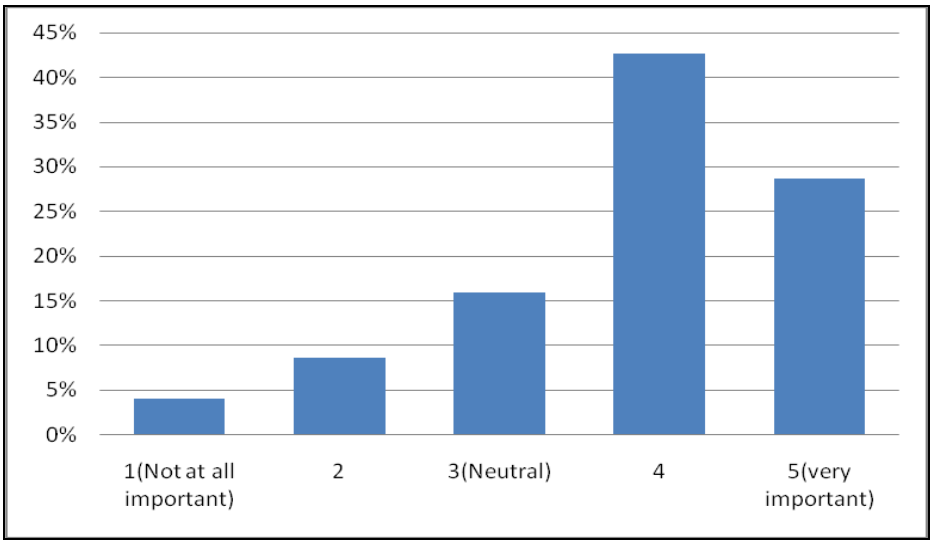
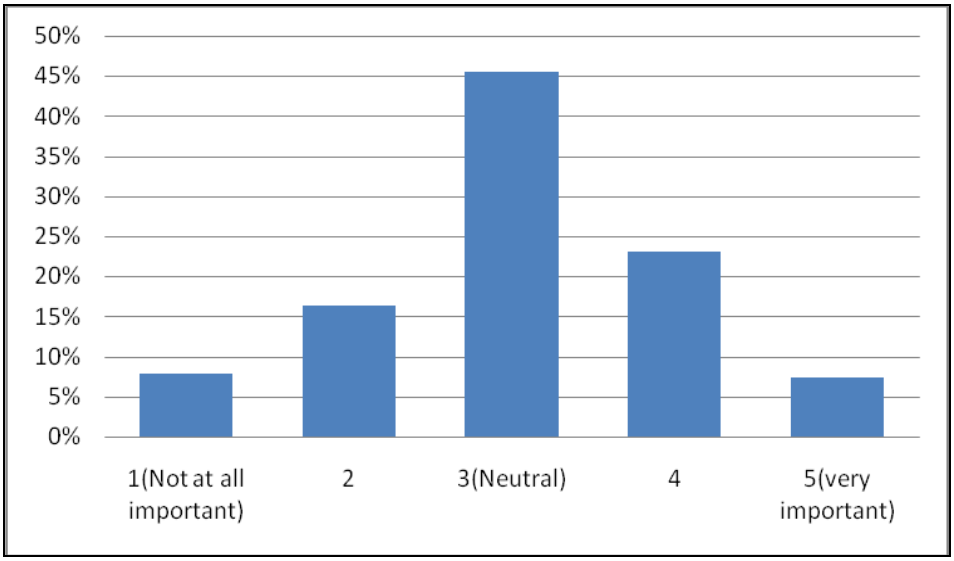
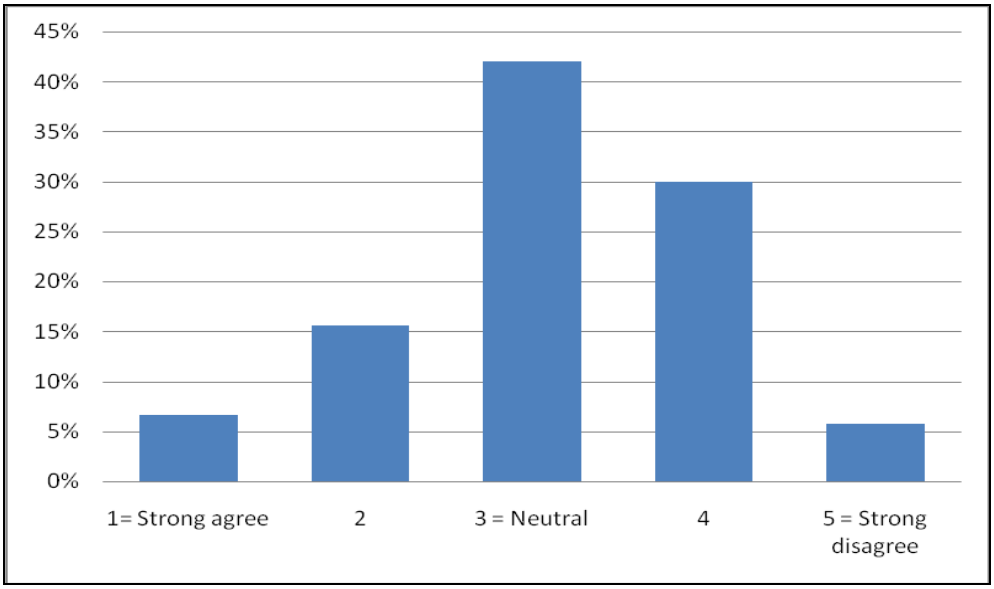


Figure 10: Importance of installed technology for lowering expenses last 5 years



Thirty-five percent (n=243) of the respondents disagreed or strongly disagreed that, over the next five years, technological innovations will contribute more to improve back of the house operations than to change customer experience, with most (41.8%) showing a neutral opinion, and 22% agreed or strongly agreed on this view (Figure 11).

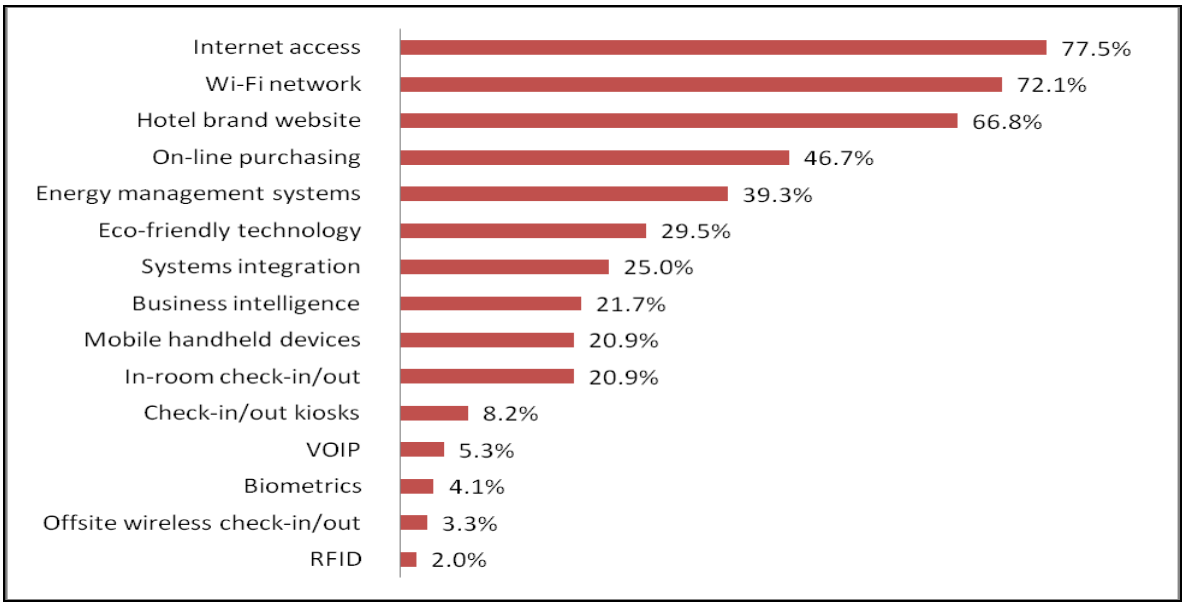
Figure 11: IT will contribute more to improve back-of-the house operations than to change customer experience next 5 years



With respect to technologies that hotels currently use to improve their operations (Figure 12), Internet access represented the most frequently used technology (77.5%, n=244), followed by Wi-Fi networks (72.1%), hotel's branded website (66.8%), online purchasing (46.7%), and energy management systems (39.3%). Other technologies thought to improve operations were: video security system, room revenue management, concierge request via Internet and email, and a high-tech business center.

A comparison of independent and chain properties revealed that chain properties are currently more likely to use check-in/out kiosks to improve operations than independent properties (Table 53). Likewise, a comparison of properties that target business travelers and those that do not found that properties that target business travelers currently are more likely to use check-in/out kiosks to improve operations than those properties that do not target business travelers (Table 59).

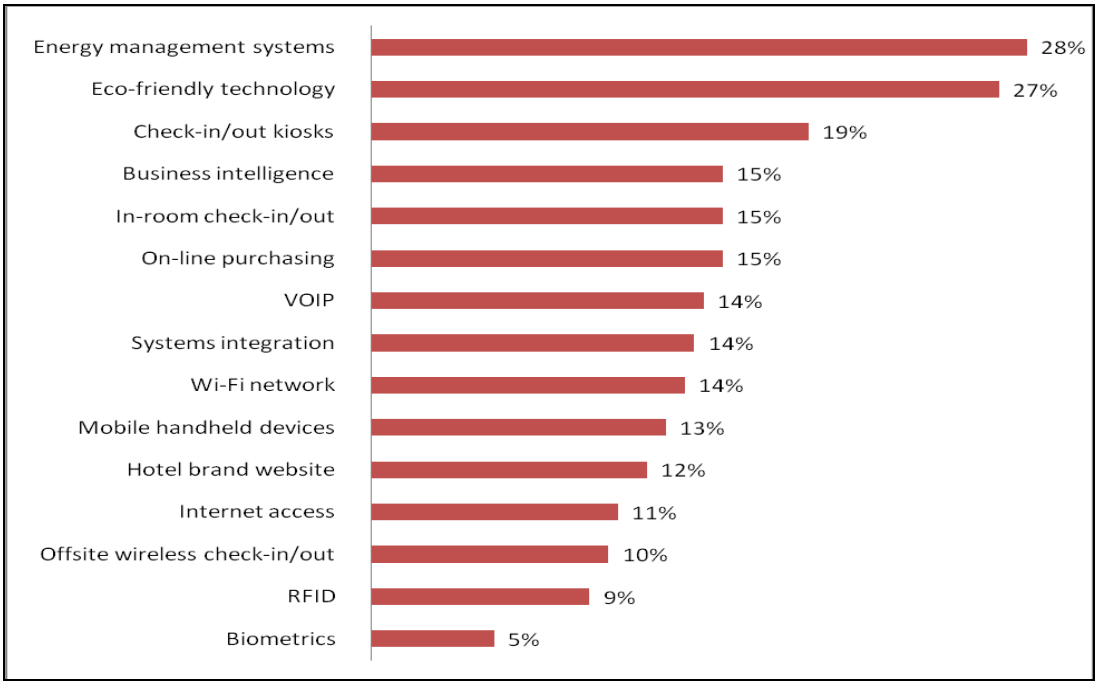
Figure 12: Percentage of properties currently offering each technology to improve operations



Over the next five years, properties plan to implement the following technologies to improve operations: energy management systems (28%, n=244), followed by eco-friendly technology (27%) and check in-out kiosks (19%). In addition, other technologies identified as

those that would improve operations were an upgraded booking engine and an updated brand website (Figure 13).

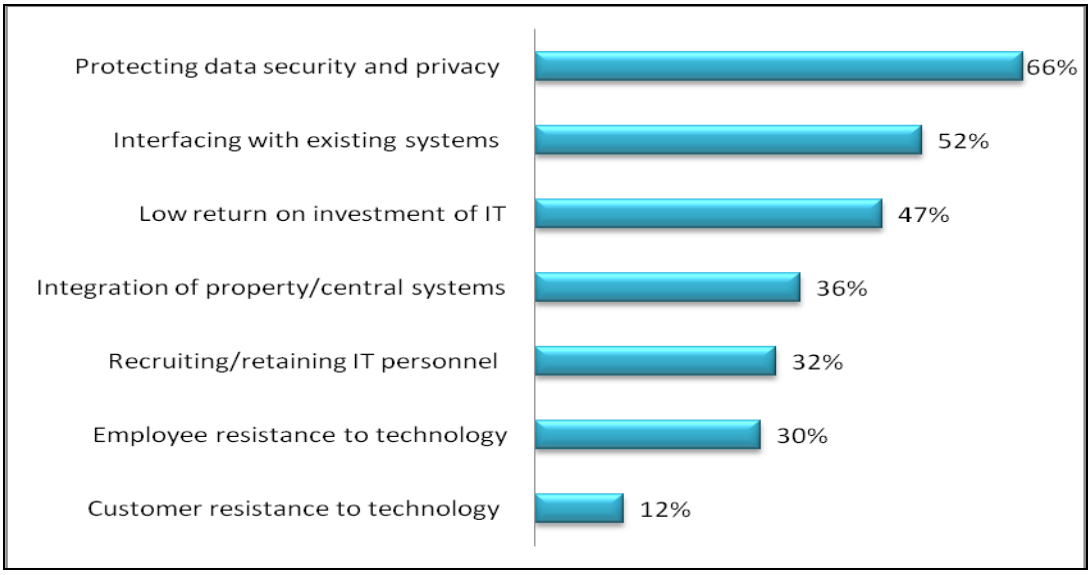
Figure 13: Percentage of properties planning to offer each technology to improve operations within 5 years



Focusing on green technology, this study discovered that hotels that outsource some IT functions are more likely to use energy management systems to improve operations than those who do not outsource (Table 26). It was also revealed that luxury properties are currently more likely to use eco-friendly technology to improve operations than those that are not luxury-oriented (Table 27).

Protecting data security and privacy represented the most important issue related to installing new technologies (66%, n=244), followed by interfacing with existing systems (52%), low return of investment of IT (47%), and integration of property/central systems (36%). A few respondents (12%) reported customer resistance to new technology as a critical issue (Figure 14). Other important issues listed by hoteliers included: maintenance, consistency of High Speed Internet Access (HSIA) in rural or coastal areas, size of the broadband, and the expense of adding technology.

Figure 14: The most important issues related to utilizing new technologies next 5 years



Data Security and Privacy

With data protection and privacy identified as the most important issue, anti-virus security systems represented the most frequently used security system (92.2%), followed by hardware firewalls, software firewalls, physical, and encrypted log-in security systems. A few respondents were using biometrics and honeypot security systems. When thinking about security systems they might plan to use, intrusion detection was the most frequently identified system (15.6%), followed by vulnerability assessment scanning (13.5%), Internet scanning (13.1%), anti-virus (11.5%), digital ID server (11.5%), and non-reusable password (9.8%) (Figures 15–16).

Figure 15: Percentage of properties currently using each security system

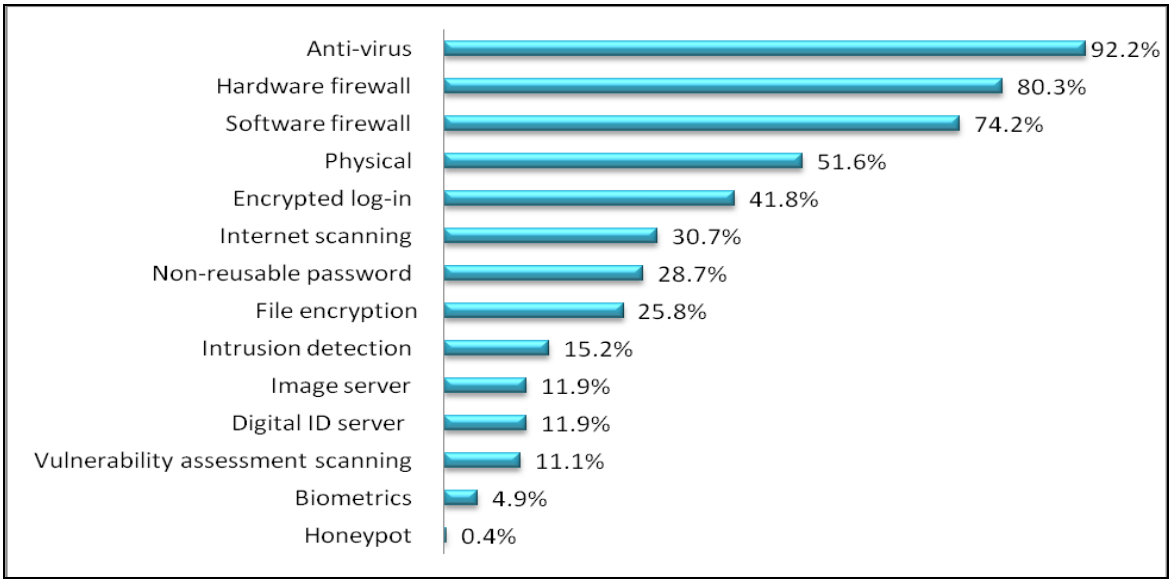
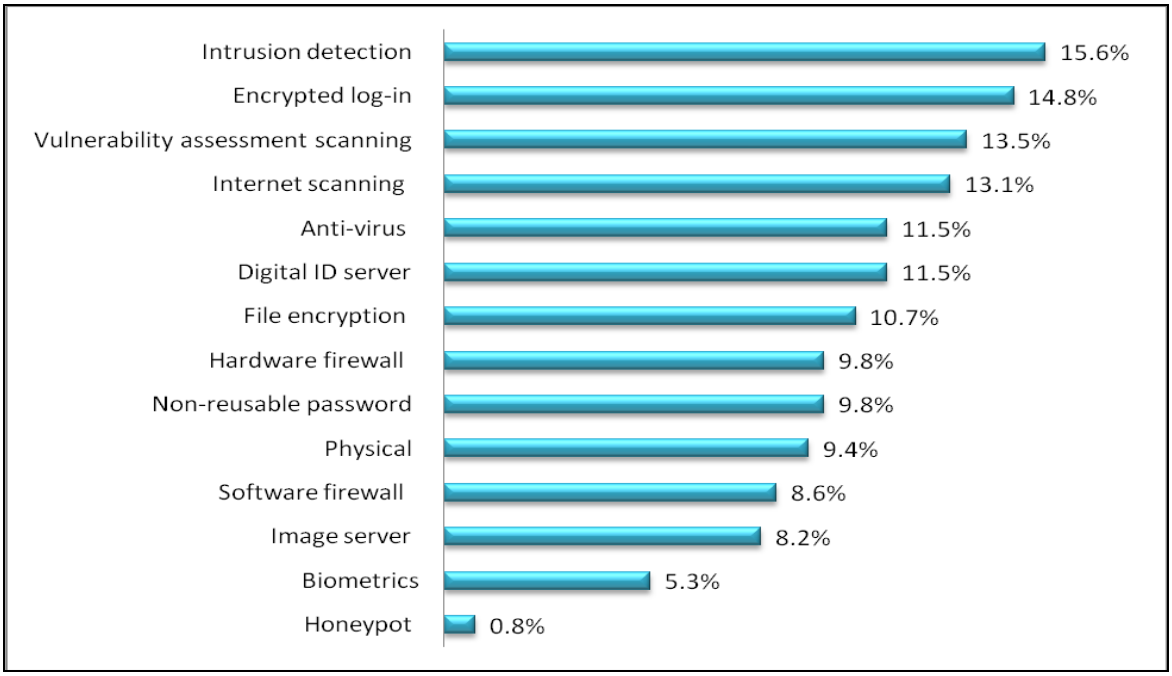


Figure 16: Percentage of properties planning to use each security system next 5 years

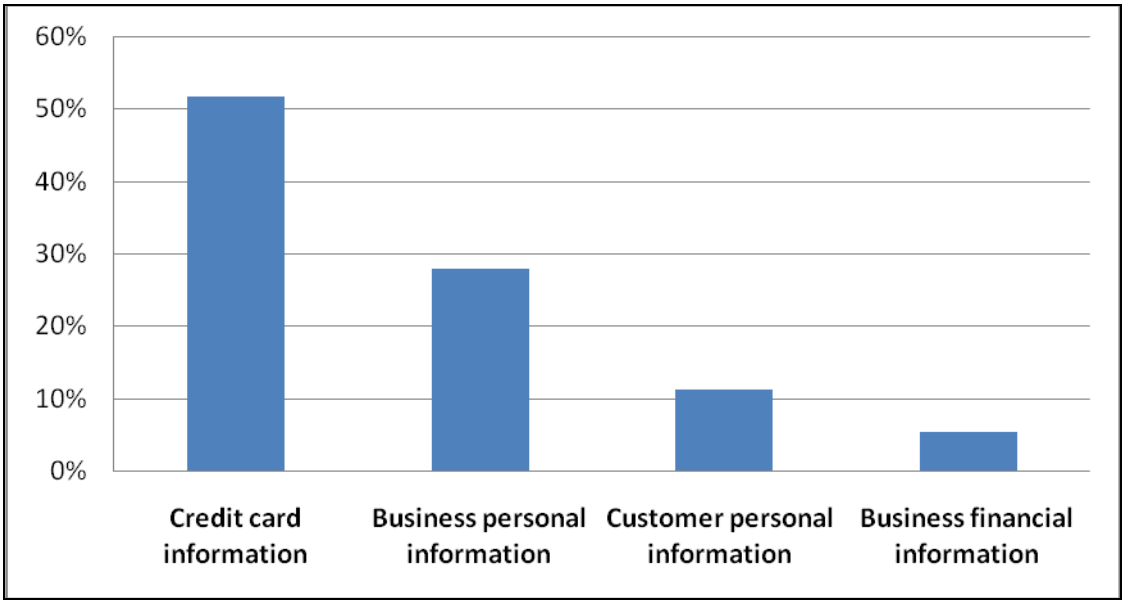


When comparing hotels with their own IT departments to those without, it was found that those with IT departments were more likely to use a wide array of information systems security systems, including: hardware and software firewalls, physical security, encrypted log-ins, file encryption, vulnerability assessment scans, intrusion detection systems, and digital ID servers. This dichotomy was found to hold true for the IS security systems hotels plan to use as well, Properties with their own IT departments were more likely to plan to use software firewalls, encrypted log-ins, image servers, file encryption, internet scanners, vulnerability assessment scanners, intrusion detection systems, and digital ID servers (Tables 28 – 43).

Interestingly, when controlling for independent versus chain properties, it was found that independent hotels with IT departments were most likely to plan to use many of IS security systems, including image servers, file encryption, Internet scanners, vulnerability assessment scanners, intrusion detection systems, digital ID servers, and biometrics.

When asked about the most important information to be protected, credit card information was selected by 51% of the respondents (n=244). Business personal information was chosen by 27.9% and the customers' personal information and business financial information were ranked as most important by fewer respondents (11% and 5.3%, respectively) (Figure 17).

Figure 17: The most importance information to be guarded



Supplementary Analysis: Analysis of Variance (ANOVA)

From the descriptive analysis, we observed various answers to each question. To explore any possible relationship between major factors and the respondents' demographic factors, Analysis of Variances (ANOVA) was performed. Respondents' opinions about the impact of technology in the previous five years (employee efficiency, guest experience, increasing revenue, and lowering expenses) and their expectations of IT contribution to improve back of house operations over the next five years were selected as dependent variables.

With respect to the proposition that technological innovations will contribute more to improve back of the house operations than to change customer experience, the mean value of chain hotels answers (3.28) was significantly higher than those of independent hotels answers (2.95, *1= strongly agree to 5= strongly disagree*). This result indicates that managers of chain hotels' expectations about IT contribution to improve their back of house operations are lower than those of independent hotels. The mean value of responses from managers of hotels without their own IT departments (3.21) was significantly higher than those from hotels with IT departments (2.93; *1= strongly agree to 5= strongly disagree*). This result indicates that respondents whose properties do not have their own IT departments believed that new technologies will not have a greater impact on improving back-of-the house operations than the customer experience over the next five years (Table 22-23).

The respondents who were outsourcing IT resources showed significantly less positive opinions than those who were not outsourcing regarding the importance of installed technology for lowering expenses (mean value of hotels outsourcing = 2.93; mean value of hotels not outsourcing = 3.21; *1= not at all important to 5= very important*) (Table 24). The respondents with sufficient IT budget more strongly agreed on the importance of technology for enhancing guest experience over the past five years (mean value of hotels with insufficient budget = 4.22; mean value of hotels with sufficient budget = 3.88; *1= not at all important to 5= very important*) (Table 25).

Conclusion

From the perspective of the hoteliers, using technology to enhance the guest experience and increase revenue will be the focus in the future. Technologies that are important to the guests such as Wi-Fi access, entertainment systems that reflect their lifestyles, and technologies that simplify their stays such as kiosks to print airline boarding passes are viewed as important, especially among hoteliers whose properties are chain hotels or who cater to business travelers. There is also an indication that hoteliers felt that the use of technology should somehow pay for itself in terms of its impact on the bottom line. That said, the focus on enhancing the guest experience might then imply that those technologies that are viewed to be "enhancements" must then also generate revenue.

Issues that were salient were data security, with a strong focus on credit card information security. This suggests that the membership is aware of the current concerns with regard to payment card industry data security standards (PCI). In the discussion of budgets, most thought their IT budgets were sufficient. This would seem to underscore the lack of understanding of the potential cost/risk of PCI compliance. Interestingly, though, properties that had their own IT departments were far more likely to use a wider array of IT security systems, meaning this risk is most likely the greatest at properties without their own IT departments.

The second most important issue listed was a long standing problem, that of systems integration. It appears that years of work in this area by a myriad of groups such as HITIS, HEDNA, and HTNG has not yet impacted hotel operations to the extent that was hoped. From the perspective of operators, the systems' data is apparently not integrating in a way that is useful.

Very interesting to the investigators was that 61% of the hoteliers responded that their IT budgets were sufficient, and nearly 4% had more than they needed. A closer look at the organizational responsibilities of the group shows that the vast majority were some level of management (61%), senior executives (30%), or owners (7%) and may not be involved with day-to-day IT operations. This may explain the perspective that technology should increase revenue or impact in the bottom line in some significant and obvious ways.

Also of interest was the observation that luxury properties were significantly more likely to use eco-friendly technologies. This, in all likelihood, is a function of both the greater revenues these properties generate and the composition of their customer bases.

An examination of the results of this survey will help the Technology & E-Business Committee of the American Hotel & Lodging Association continue its work to identify and help to fill the technology knowledge gap for the AH&LA membership. By identifying issues such as data privacy and security, cost, and guest experience enhancement, the committee will work to help the membership understand those technologies most likely to help them with their operational goals. While each property may have different technology objectives, good information will help them make informed decisions.

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Appendix A (Descriptive Analysis)

Table 1: General opinions about importance of technology (n=244)

	Frequency	Percent of n
	Importance of technology for employee efficiency	
1(Not at all important)	6	2.5%
2	6	2.5%
3(Neutral)	37	15.2%
4	95	38.9%
5(very important)	100	41.0%
	Importance of technology for enhancing guest experiences last 5 yrs	
1(Not at all important)	0	0%
2	9	3.7%
3(Neutral)	34	13.9%
4	128	52.5%
5(very important)	73	29.9%
	Importance of installed technology for generating revenue last 5 yrs	
1(Not at all important)	10	4.1%
2	21	8.6%
3(Neutral)	39	16.0%
4	104	42.6%
5(very important)	70	28.7%
	Importance of installed technology for lowering expenses last 5 yrs	
1(Not at all important)	19	7.8%
2	40	16.4%
3(Neutral)	111	45.5%
4	56	23.0%
5(very important)	18	7.4%

Table 2: Most important IT goals next 5 yrs (n=244)

	Frequency*	Percent of n
Lower expenses	38	16%
Enhance customer experience	129	53%
Generate revenue	99	41%
Differentiate from competition	49	20%
Increase security	15	6%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were allowed.*

Table 3: IT will contribute more to improve back of the house than to change customer experience next 5 yrs (n=243)

	N	Percent (%)	Valid Percent
1(= Strong agree)	16	6.6	6.6%
2	38	15.6	15.6%
3 (= Neutral)	102	41.8	42.0%
4	73	29.9	30.0%
5 (= Strong disagree)	14	5.7	5.8%
Valid Total	**243**	**99.6**	**100.0%**
Missing	1	.4	

Table 4: Technology services customers most care about (n=244)

	Frequency*	Percent of n
Infrastructure for handheld	66	27%
Wi-Fi hotspots	200	82%
Check-in/out kiosks	16	7%
On-line check in / out	26	11%
VOIP	24	10%
RFID	8	3%
In-room check-out	38	16%
Kiosks for airline check-in/boarding pass	92	38%
Internet kiosks in lobby	60	25%
Wireless check-in available off site	21	9%
Biometrics for payment, security	10	4%
Support for Slingbox	11	5%
In-room entertainment systems	117	48%

**Note: The total frequency is larger than the total sample size (244) because three choices were requested.*

Table 5: Number of properties currently offering each technology (n=244)

	Frequency*	Percent of n
Infrastructure for handheld	55	22.5%
Wi-Fi hotspot	210	86.1%
Check-in/out kiosks in lobby	16	6.6%
On-line check-in / out	33	13.5%
VOIP	7	2.9%
RFID	3	1.2%
In-room check-out	68	27.9%
Kiosk for airline check-in/boarding pass	87	35.7%
Internet kiosks in lobby	89	36.5%
Wireless check-in available offsite	6	2.5%
Biometrics for payment, security	0	0.0%
Support for Slingbox	0	0.0%
In-room entertainment systems	114	46.7%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were allowed.*

Table 6: Number of properties planning to offer each technology within 5 years (n=244)

	Frequency*	Percent of n
Infrastructure for handheld	51	21%
Wi-Fi hotspot	52	21%
Check-in/out kiosks in lobby	45	18%
On-line check-in / out	44	18%
VOIP	42	17%
RFID	14	6%
In-room check-out	52	21%
Kiosk for airline check-in/boarding pass	33	14%
Internet kiosk in lobby	48	20%
Wireless check-in available offsite	31	13%
Biometrics for payment, security	12	5%
Support for Slingbox	15	6%
In-room entertainment systems	76	31%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were requested.*

Table 7: Technology related to improve operations:
Number of properties currently using each technology (n=244)

	Frequency*	Percent of n
Check-in/out kiosks	20	8.2%
Internet access	189	77.5%
Wi-Fi network	176	72.1%
VOIP	13	5.3%
RFID	5	2.0%
Mobile handheld devices	51	20.9%
Business intelligence	53	21.7%
Offsite wireless check-in/out	8	3.3%
Biometrics	10	4.1%
In-room check-in/out	51	20.9%
Energy management systems	96	39.3%
Hotel brand website	163	66.8%
On-line purchasing	114	46.7%
Eco-friendly technology	72	29.5%
Systems integration	61	25.0%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were requested.*

Table 8: Technology related to improve operations:
Number of properties planning to use each technology over the next five years (n=244)

	Frequency*	Percent of n
Check-in/out kiosks	46	19%
Internet access	26	11%
Wi-Fi network	33	14%
VOIP	35	14%
RFID	23	9%
Mobile handheld devices	31	13%
Business intelligence	37	15%
Offsite wireless check-in/out	25	10%
Biometrics	13	5%
In-room check-in/out	37	15%
Energy management systems	69	28%
Hotel brand website	29	12%
On-line purchasing	37	15%
Eco-friendly technology	66	27%
Systems integration	34	14%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were requested.*

Table 9: The most important issues related to utilizing new technology next five years (n=244)

	Frequency*	Percent of n
Protecting data security and privacy	160	66%
Integration of property/central systems	87	36%
Customer resistance to technology	29	12%
Employee resistance to technology	74	30%
Recruiting/retaining IT personnel	79	32%
Low return on investment of IT	114	47%
Interfacing with existing systems	127	52%

**Note: The total is larger than the total sample size (244) because multiple choices were allowed in this question*

Table 10: Number of properties currently using each security system (n=244)

	Frequency*	Percent of n
Anti-virus security systems	225	92.2%
Hardware firewall security systems	196	80.3%
Physical security systems	126	51.6%
Software firewall security systems	181	74.2%
Non-reusable password security systems	70	28.7%
Encrypted log-in security systems	102	41.8%
Image server security systems	29	11.9%
Biometric security systems	12	4.9%
File encryption security systems	63	25.8%
Internet scanning security systems	75	30.7%
Vulnerability assessment scanning security systems	27	11.1%
Intrusion detection security systems	37	15.2%
Digital ID server security systems	29	11.9%
Honeypot security systems	1	0.4%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were allowed.*

Table 11: Number of properties planning to offer each security system next 5 years (n=244)

	Frequency	Percent of n
Anti-virus security systems	28	11.5%
Hardware firewall security systems	24	9.8%
Physical security systems	23	9.4%
Software firewall security systems	21	8.6%
Non-reusable password security systems	24	9.8%
Encrypted log-in security systems	36	14.8%
Image server security systems	20	8.2%
Biometric security systems	13	5.3%
File encryption security systems	26	10.7%
Internet scanning security systems	32	13.1%
Vulnerability assessment scanning security systems	33	13.5%
Intrusion detection security systems	38	15.6%
Digital ID server security systems	28	11.5%
Honeypot security systems	2	0.8%

**Note: The total frequency is larger than the total sample size (244) because multiple choices were allowed.*

Table 12: Number of respondents who answered each information as the most important information to be guarded (n=244)

	Frequency	Percent of n
Credit card information	126	51.6%
Business personal information	68	27.9%
Customer personal information	27	11.1%
Business financial information	13	5.3%

Table 13: Job title

	Frequency	Valid Percent (n=241)
Owner	17	7.1%
CEO	19	7.9%
President	15	6.2 %
Vice President	11	5.0%
Director	26	11.2%
Manager	132	61.4%
Other	38	1.2%
Total	241	100.0%

Table 14: Working department

	Frequency	Valid Percent (n=222)
Operation	179	80.6%
Others	17	7.7%
Finance	10	4.5%
Marketing	8	3.6%
Technology (IT or Engineering)	7	3.2%
Convention	1	.5%
Total	222	100.0%

Table 15: The number of years a respondent has worked in the hotel industry

	Frequency	Valid Percent (n=241)
0-5 years	22	9.1%
6-10 years	35	14.5%
11-15 years	33	13.7%
16-20 years	33	13.7%
21+ years	118	49.0%
Total	241	100.0%

Table 16: Property classification

	Frequency	Valid Percent (n=239)
Economy	11	4.6%
Mid-range	142	59.4%
Luxury	56	23.4%
Others	30	12.6%
Total	239	100.0%

Table 17: Chain or independent hotel

	Frequency	Valid Percent (n=235)
Independent	109	46.4%
Chain	126	53.6%
Total	235	100.0%

Table 18: Target market

	Frequency	Percent of n (n=244)
Business travelers	166	68.0%
Conventioneers	75	30.7%
Leisure travelers	198	81.1%
Family travelers	140	57.4%

Table 19: Has Own IT department

	Frequency	Valid Percent (n= 234)
IT department	72	30.8%
No IT department	162	69.2%
Total	234	100.0%

Table 20: Outsourcing IT functions

	Frequency	Valid Percent (n=234)
Outsourcing	107	48.0%
Not outsourcing	116	52.0%
Total	223	100.0%

Table 21: IT Budget sufficiency

	Frequency	Valid Percent (n=205)
Not sufficient	72	35.1%
Sufficient	125	61.0%
More than sufficient	8	3.9%
Total	205	100.0%

Appendix B (ANOVA)

Table 22: Mean difference and ANOVA table (Independent hotel vs. Chain hotel)

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
IT will improve back of house more than customer experience next 5 yrs **(1=strong agree 5=strong disagree)**	**Independent**	109	**2.95**	1.049	.100	2.76	3.15	1	5
	Chain	125	**3.28**	.858	.077	3.13	3.43	1	5
	Total	234	3.13	.963	.063	3.00	3.25	1	5

		Sum of Squares	df	Mean Square	F	Sig.
IT will improve Back of House more than customer experience next 5 yrs **(1= strong agree to 5=strong disagree)**	Between Groups	6.183	1	6.183	6.832	**.010***
	Within Groups	209.971	232	.905		
	Total	216.154	233			

**p<0.05*

Table 23: Mean difference and ANOVA table (IT Department vs. No IT Department)

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
IT will improve back of house more than customer experience next 5 yrs **(1= strong agree to 5=strong disagree)**	**IT Dept**	72	**2.93**	1.039	.122	2.69	3.17	1	5
	No IT Dept	161	**3.21**	.925	.073	3.07	3.36	1	5
	Total	233	3.12	.968	.063	3.00	3.25	1	5

		Sum of Squares	df	Mean Square	F	Sig.
IT will improve back of hose more than customer experience next 5 yrs **(1= strong agree to 5= strong disagree)**	Between Groups	3.918	1	3.918	4.240	**.041***
	Within Groups	213.473	231	.924		
	Total	217.391	232			

**p<0.05*

Table 24: Mean difference and ANOVA table (Not outsourcing vs. Outsourcing)

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
Importance of installed technology for lowering expenses last 5 yrs **(1= low to 5=high)**	**Outsourcing**	107	**2.93**	1.034	.100	2.73	3.12	1	5
	Not Outsourcing	116	**3.21**	.965	.090	3.03	3.38	1	5
	Total	223	3.07	1.006	.067	2.94	3.20	1	5

		Sum of Squares	df	Mean Square	F	Sig.
Importance of installed technology for lowering expenses last 5 yrs **(1= low to 5=high)**	Between Groups	4.416	1	4.416	4.427	**.037***
	Within Groups	220.436	221	.997		
	Total	224.852	222			

**p<0.05*

Table 25: Mean difference and ANOVA table (Insufficient vs. Sufficient IT budget)

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
Importance of technology for enhancing guest experiences last 5 yrs. **(1=low to 5=high)**	**Insufficient**	72	**3.88**	.821	.097	3.68	4.07	2	5
	Sufficient	133	**4.22**	.689	.060	4.10	4.34	2	5
	Total	205	4.10	.754	.053	3.99	4.20	2	5

		Sum of Squares	df	Mean Square	F	Sig.
Importance of technology for enhancing guest experiences last 5 yrs. **(1=low to 5=high)**	Between Groups	5.497	1	5.497	10.094	**.002***
	Within Groups	110.552	203	.545		
	Total	116.049	204			

**p<0.05*

Appendix C. Cross tabulation (Green Technology)

Table 26: Hotel currently uses energy management systems to improve operations * Respondent property outsources IT functions

		Hotel currently uses energy management systems to improve operations		
		No	Yes	Total
Respondent property outsources IT functions	No	79 68.1%	37 31.9%	116 100.0%
	Yes	58 54.2%	49 45.8%	107 100.0%
	Total	137 61.4%	86 38.6%	223 100.0%

X^2 (1, N=223) = 4.538, p=0.033; Pearson's R=0.143

Table 27: Hotel currently uses eco-friendly technology to improve operations * Respondent property classification is luxury

		Hotel currently uses eco-friendly technology to improve operations		
		No	Yes	Total
Respondent property classification is Luxury	Not Luxury	137 74.9%	46 25.1%	183 100.0%
	Luxury	34 60.7%	22 39.3%	56 100.0%
	Total	171 71.5%	68 28.5%	239 100.0%

X^2 (1, N=223) = 4.217, p=0.04; Pearson's R= 0.133

Appendix D. Cross tabulation (Security Systems)

Table 28: Respondent property has own IT department * Hotel currently uses hardware firewall security systems

		Hotel currently uses hardware firewall security systems		
		No	Yes	Total
Property has own IT department	No	37 22.8%	125 77.2%	162 100.0%
	Yes	5 6.9%	67 93.1%	72 100.0%
	Total	42 17.9%	192 82.1%	234 100.0%

X^2 (1, N = 234) 8.551, p = 0.003; Pearson's R = 0.191

Table 29: Respondent property has own IT department * Hotel currently uses hardware physical security systems

		Hotel currently uses physical security systems		
		No	Yes	Total
Property has own IT department	No	86 53.1%	76 46.9%	162 100.0%
	Yes	23 31.9%	49 68.1%	72 100.0%
	Total	109 46.6%	125 53.4%	234 100.0%

X^2 (1, N = 234) 8.954, p = 0.003; Pearson's R = 0.196

Table 30: Respondent property has own IT department * Hotel currently uses software firewall security systems

		Hotel currently uses software firewall security systems		
		No	Yes	Total
Property has own IT department	No	45	117	162
		27.8%	72.2%	100.0%
	Yes	11	61	72
		15.3%	84.7%	100.0%
	Total	56	178	234
		23.9%	76.1%	100.0%

X^2 (1, N = 234) 4.278, p = 0.039; Pearson's R = 0.083

Table 31: Respondent property has own IT department * Hotel currently uses encrypted log-in security systems

		Hotel currently uses encrypted log-in security systems		
		No	Yes	Total
Property has own IT department	No	104	58	162
		64.2%	35.8%	100.0%
	Yes	30	42	72
		41.7%	58.3%	100.0%
	Total	134	100	234
		57.3%	42.7%	100.0%

X^2 (1, N = 234) 10.340, p = 0.001; Pearson's R = 0.210

Table 32: Respondent property has own IT department * Hotel currently uses file encryption security systems

		Hotel currently uses file encryption security systems		
		No	Yes	Total
Property has own IT department	No	129	33	162
		79.6%	20.4%	100.0%
	Yes	44	28	72
		61.1%	38.9%	100.0%
	Total	173	61	234
		73.9%	26.1%	100.0%

X^2 (1, N = 234) 8.870, p = 0.003; Pearson's R = 0.195

Table 33: Respondent property has own IT department * Hotel currently uses vulnerability assessment scanning security systems

		Hotel currently uses vulnerability assessment scanning security systems		
		No	Yes	Total
Property has own IT department	No	150	12	162
		92.6%	7.4%	100.0%
	Yes	57	15	72
		79.2%	20.8%	100.0%
	Total	207	27	234
		88.5%	11.5%	100.0%

X^2 (1, N = 234) 8.870, p = 0.003; Pearson's R = 0.194

Table 34: Respondent property has own IT department (1 no, 2 yes) * Hotel currently uses intrusion detection security systems

		Hotel currently uses intrusion detection security systems		
		No	Yes	Total
Property has own IT department	No	143	19	162
		88.3%	11.7%	100.0%
	Yes	54	18	72
		75.0%	25.0%	100.0%
	Total	197	37	234
		84.2%	15.8%	100.0%

X^2 (1, N = 234) 6.595, p = 0.010; Pearson's R = 0.168

Table 35: Respondent property has own IT department (1 no, 2 yes) * Hotel currently uses digital ID server security systems.

		Hotel currently uses digital ID server security systems		
		No	Yes	Total
Property has own IT department	No	147	15	162
		90.7%	9.3%	100.0%
	Yes	58	14	72
		80.6%	19.4%	100.0%
	Total	205	29	234
		87.6%	12.4%	100.0%

X^2 (1, N = 234) 4.763, p = 0.029; Pearson's R = 0.143

Table 36: Respondent property has own IT department * Hotel plans to use software firewall security systems

		Hotel plans to use software firewall security systems		
		No	Yes	Total
Property has own IT department	No	153	9	162
		94.4%	5.6%	100.0%
	Yes	60	12	72
		83.3%	16.7%	100.0%
	Total	213	21	234
		91.0%	9.0%	100.0%

X^2 (1, N = 234) 7.533, p = 0.006; Pearson's R = 0.179

Table 37: Respondent property has own IT department * Hotel plans to use encrypted log-in security systems

		Hotel plans to use encrypted log-in security systems		
		No	Yes	Total
Property has own IT department	No	143	19	162
		88.3%	11.7%	100.0%
	Yes	55	17	72
		76.4%	23.6%	100.0%
	Total	198	36	234
		84.6%	15.4%	100.0%

X^2 (1, N = 234) 5.407, p = 0.020; Pearson's R = 0.152

Table 38: Respondent property has own IT department * Hotel plans to use image server security systems

		Hotel plans to use image server security systems		
		No	Yes	Total
Property has own IT department	No	153	9	162
		94.4%	5.6%	100.0%
	Yes	61	11	72
		84.7%	15.3%	100.0%
	Total	214	20	234
		91.5%	8.5%	100.0%

X^2 (1, N = 234) 6.028, p = 0.014; Pearson's R = 0.160

Table 39: Respondent property has own IT department * Hotel plans to use file encryption security systems

		Hotel plans to use file encryption security systems		
		No	Yes	Total
Property has own IT department	No	150	12	162
		92.6%	7.4%	100.0%
	Yes	58	14	72
		80.6%	19.4%	100.0%
	Total	208	26	234
		88.9%	11.1%	100.0%

X^2 (1, N = 234) 7.313, p = 0.007; Pearson's R = 0.177

Table 40: Respondent property has own IT department Hotel plans to use internet scanning security systems.

		Hotel plans to use internet scanning security systems		
		No	Yes	Total
Property has own IT department	No	146	16	162
		90.1%	9.9%	100.0%
	Yes	56	16	72
		77.8%	22.2%	100.0%
	Total	202	32	234
		86.3%	13.7%	100.0%

X^2 (1, N = 234) 6.436, p = 0.011; Pearson's R = 0.166

Table 41: Respondent property has own IT department * Hotel plans to use vulnerability assessment scanning security systems

		Hotel plans to use vulnerability assessment scanning security systems		
		No	Yes	Total
Property has own IT department	No	147	15	162
		90.7%	9.3%	100.0%
	Yes	54	18	72
		75.0%	25.0%	100.0%
	Total	201	33	234
		85.9%	14.1%	100.0%

X^2 (1, N = 234) 10.195, p = 0.001; Pearson's R = 0.209

Table 42: Respondent property has own IT department * Hotel plans to use intrusion detection security systems

		Hotel plans to use intrusion detection security systems		
		No	Yes	Total
Property has own IT department	No	142	20	162
		87.7%	12.3%	100.0%
	Yes	54	18	72
		75.0%	25.0%	100.0%
	Total	196	38	234
		83.8%	16.2%	100.0%

X^2 (1, N = 234) 5.868, p = 0.015; Pearson's R = 0.158

Table 43: Respondent property has own IT department * Hotel plans to use digital ID server security systems

		Hotel plans to use digital ID server security systems		
		No	Yes	Total
Property has own IT department	No	149 92.0%	13 8.0%	162 100.0%
	Yes	57 79.2%	15 20.8%	72 100.0%
	Total	206 88.0%	28 12.0%	234 100.0%

X^2 (1, N = 234) 7.763, p = 0.005; Pearson's R = 0.182

Appendix E. Cross tabulation (Self-Service Technology)

Table 44: Respondent property is chain hotel/independent hotel * Customers care most about airline check-in/boarding pass

		Customers care most about airline check-in/boarding pass		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	78 53.1%	31 35.2%	109 46.4%
	Chain	69 46.9%	57 64.8%	126 53.6%
	Total	147 100.0%	88 100.0%	235 100.0%

X^2 (1, n=235) = 7.040, p=0.008; Pearson's R = 0.173

Table 45: Respondent property is chain hotel/independent hotel * Hotel currently offers check-in/out kiosks in lobby

		Hotel currently offers check-in/out kiosks in lobby		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	108 49.1%	1 6.7%	109 46.4%
	Chain	112 50.9%	14 93.3%	126 53.6%
	Total	220 100.0%	15 100.0%	235 100.0%

X^2 (1, n=235) = 10.163, p=0.001; Pearson's R = 0.208

Table 46: Respondent property is chain hotel/independent hotel * Hotel currently offers on-line check in/out

		Hotel currently offers on-line check in/out		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	105 51.7%	4 12.5%	109 46.4%
	Chain	98 48.3%	28 87.5%	126 53.6%
	Total	203 100.0%	32 100.0%	235 100.0%

X^2 (1, n=235) = 17.101, p=0.000; Pearson's R = 0.270

Table 47: Respondent property is chain hotel/independent hotel * Hotel currently offers in-room check-out

		Hotel currently offers in-room check-out		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	90 52.6%	19 29.7%	109 46.4%
	Chain	81 47.4%	45 70.3%	126 53.6%
	Total	171 100.0%	64 100.0%	235 100.0%

X^2 (1, n=235) = 9.858, p=0.002; Pearson's R = 0.205

Table 48: Respondent property is chain hotel/independent hotel * Hotel currently offers airline check-in/boarding pass

		Hotel currently offers airline check-in/boarding pass		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	80 52.3%	29 35.4%	109 46.4%
	Chain	73 47.7%	53 64.6%	126 53.6%
	Total	153 100.0%	82 100.0%	235 100.0%

X^2 (1, n=235) = 6.147, p=0.013; Pearson's R = 0.162

Table 49: Respondent property is chain hotel/independent hotel * Hotel currently offers internet kiosk in lobby

		Hotel currently offers internet kiosk in lobby		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	79 52.7%	30 35.3%	109 46.4%
	Chain	71 47.3%	55 64.7%	126 53.6%
	Total	150 100.0%	85 100.0%	235 100.0%

X^2 (1, n=235) = 6.584, p=0.010; Pearson's R = 0.167

Table 50: Respondent property is chain hotel/independent hotel * Hotel plans to offer check-in/out kiosks within five years

		Hotel plans to offer check-in/out kiosks within five years		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	99 51.3%	10 23.8%	109 46.4%
	Chain	94 48.7%	32 76.2%	126 53.6%
	Total	193 100.0%	42 100.0%	235 100.0%

X^2 (1, n=235) = 10.478, p=0.001; Pearson's R = 0.211

Table 51: Respondent property is chain hotel/independent hotel * Hotel plans to offer in-room check-out within five years

		Hotel plans to offer in-room check-out within five years		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	93 50.3%	16 32.0%	109 46.4%
	Chain	92 49.7%	34 68.0%	126 53.6%
	Total	185 100.0%	50 100.0%	235 100.0%

X^2 (1, n=235) = 5.283, p=0.022; Pearson's R = 0.150

Table 52: Respondent property is chain hotel/independent hotel * Hotel plans to offer airline check-in kiosks within five years

		Hotel plans to offer airline check-in kiosks within five years		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	100 49.5%	9 27.3%	109 46.4%
	Chain	102 50.5%	24 72.7%	126 53.6%
	Total	202 100.0%	33 100.0%	235 100.0%

X^2 (1, n=235) = 5.638, p=0.018; Pearson's R = 0.155

Table 53: Respondent property is chain hotel/independent hotel * Hotel currently uses check-in/out kiosks to improve operations

		Hotel currently uses check-in/out kiosks to improve operations		
		No	Yes	Total
Property is chain hotel/independent hotel	Independent	107 49.5%	2 10.5%	109 46.4%
	Chain	109 50.5%	17 89.5%	126 53.6%
	Total	216 100.0%	19 100.0%	235 100.0%

X^2 (1, n=235) = 10.687, p=0.001; Pearson's R = 0.213

Table 54: Respondent property targets business travelers * Hotel currently offers on-line check in/out

		Hotel currently offers on-line check in/out		
		No	Yes	Total
Respondent property targets business travelers	No	73 34.6%	5 15.2%	78 32.0%
	Yes	138 65.4%	28 84.8%	166 68.0%
	Total	211 100.0%	33 100.0%	244 100.0%

X^2 (1, n=244) = 4.962, p=0.026; Pearson's R = 0.282

Table 55: Respondent property targets business travelers * Hotel currently offers in-room check-out

		Hotel currently offers in-room check-out		
		No	Yes	Total
Respondent property targets business travelers	No	64 36.4%	14 20.6%	78 32.0%
	Yes	112 63.6%	54 79.4%	166 68.0%
	Total	176 100.0%	68 100.0%	244 100.0%

X^2 (1, n=244) = 5.613, p=0.018; Pearson's R = 0.152

Table 56: Respondent property targets business travelers * Hotel currently offers airline check-in/boarding pass

		Hotel currently offers airline check-in/boarding pass		
		No	Yes	Total
Respondent property targets business travelers	No	60 38.2%	18 20.7%	78 32.0%
	Yes	97 61.8%	69 79.3%	166 68.0%
	Total	157 100.0%	87 100.0%	244 100.0%

X^2 (1, n=244) = 7.907, p=0.005; Pearson's R = 0.180

Table 57: Respondent property targets business travelers * Hotel plans to offer check-in/out kiosks within five years

		Hotel plans to offer check-in/out kiosks within five years		
		No	Yes	Total
Respondent property targets business travelers	No	72 36.2%	6 13.3%	78 32.0%
	Yes	127 63.8%	39 86.7%	166 68.0%
	Total	199 100.0%	45 100.0%	244 100.0%

X^2 (1, n=244) = 8.809, p=0.003; Pearson's R = 0.190

Table 58: Respondent property targets business travelers * Hotel plans to offer airline check-in kiosks within five years

		Hotel plans to offer airline check-in kiosks within five years		
		No	Yes	Total
Respondent property targets business travelers	No	73 34.6%	5 15.2%	78 32.0%
	Yes	138 65.4%	28 84.8%	166 68.0%
	Total	211 100.0%	33 100.0%	244 100.0%

X^2 (1, n=244) = 4.962, p=0.026; Pearson's R = 0.143

Table 59: Respondent property targets business travelers * Hotel currently uses check-in/out kiosks to improve operations

		Hotel currently uses check-in/out kiosks to improve operations		
		No	Yes	Total
Respondent property targets business travelers	No	77 34.4%	1 5.0%	78 32.0%
	Yes	147 65.6%	19 95.0%	166 68.0%
	Total	224 100.0%	20 100.0%	244 100.0%

X^2 (1, n=244) = 7,285, p=0.007; Pearson's R = 0.173

Table 60: Respondent property targets family travelers * Hotel plans to offer check-in/out kiosks within five years

		Hotel plans to offer check-in/out kiosks within five years		
		No	Yes	Total
Respondent property targets family travelers	No	91 45.7%	13 28.9%	104 42.6%
	Yes	108 54.3%	32 71.1%	140 57.4%
	Total	199 100.0%	45 100.0%	244 100.0%

X^2 (1, n=244) = 4.256 p=0.039; Pearson's R = 0.132