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Where is IT going? An Overview of Technology Decision Makers' Perceptions in the U.S. Lodging Industry

Introduction

The U.S. Lodging industry is recognized as a dynamic subset of the hospitality industry. Such dynamic traits of the lodging industry consist of gaps between uncertain room demand and static room supply, an observed fluctuant room rate over time, and high hotel operation costs (Singh, Dev, & Mandelbaum, 2014; Croes & Semrad, 2012; Enz & Canina, 2006; Corgel, 2004). Over 18,000 U.S. hotel chains with more than 2,200,000 rooms belong to this dynamic industry (Garrido, 2013; Smith Travel Research, 2013). In this highly competitive environment, hotel managers should inevitably pay attention to their guests' needs in order to survive (Bilgihan, Cobanoglu, & Miller, 2010; Sammons, Moreo, Benson, & Demicco, 1999). Nowadays, most hotel organizations, regardless of properties' size, segment, or geographic location, adopt advanced technologies as a value-added service since such technologies serve as a competitive advantage (Bilgihan et al., 2010; Collins & Cobanoglu, 2008). Indeed, various research studies have revealed that technology plays a critical role for enhancing contemporary travelers' satisfaction during their stays (Bilgihan et al., 2010; Cobanoglu, Berezina, Kasavana & Erdem, 2011; Collins & Cobanoglu, 2008).

In spite of the growing body of evidence that technology plays as an important driver for successful hotel business, no study has offered a detailed examination of the patterns and trends based on the perspective of the technology decision makers (i.e. CIO, Director of Technology, etc.). By investigating and documenting the current stage of various lodging firms' decision-making processes and investments in technology, this study offers an opportunity to review technology trends and issues in this highly dynamic environment.

Purpose of the Study

The state of the lodging industry, since the recession, is looking brighter with near record high profits reported in 2012. Despite the good news on profits, revenue growth has been moderate (STR, 2013). Moreover, some leading experts of the lodging industry point out to the on-going uncertainty across the lodging segments (Wade, 2014). The 2014 outlook for the globallodging industry reflects a competitive environment with strategic opportunities and threats for all entities involved.

One of the key purposes of technology is to decrease uncertainty. In order to assist hotelexecutives in their decision-making process, the main purpose of this study is to examine perceptions and opinions of decision makers about issues and trends in information technology (IT) within the lodging industry context. By documenting the opinions and perceptions of lodging technology decision makers, this study offers a technology benchmark for lodging organizations in the U.S. while providing an overview of current technology issues and trends that are perceived to be impacting the industry.

Brief Overview of Methodology and Results

Based on a review of related literature and discussions with subject matter experts, a questionnaire was designed to assess the lodging industry technology trends and issues. The study was set up as an online questionnaire and distributed during fall 2012 to hotel executives who are subscribers of a leading hospitality technology magazine via personalized e-mails. One hundred and ninety-seven completed surveys were returned over a period of seven weeks, representing a total of 25,879 hotel properties. The respondents reported that their respective organizations managed and/or owned over 49,000 hotel properties. According to the 2012 Lodging Industry Profile report by AH&LA, there were over 52,000 properties in the U.S. Thus,the representation of properties in this study is quite considerable.

The readership of the HT magazine, a trade journal that focuses on hospitality technologynews, was selected as the study population since they represent the most knowledgeable professionals when it comes to decisions and opinions regarding technology. The qualifications of those who participated in the study is evident in the below mentioned numbers. The respondents had over 1000 years of combined professional experience in the lodging industry with over 70% having attained a college degree or higher level of education. Almost half of the respondents were executives with their primary responsibility being Information Technology.
About a quarter of the respondents were CEO's, owners, and General Managers. The remainingquarter included a mix of diverse professionals in accounting, revenue management, sales and marketing, and operations such as F&B. One half of the participants in the study reflected perspectives and decisions at the corporate level while the remaining participants primary responsibility was at the property or regional level.

Both full and limited-service hotels were represented in the study, with the following break-down across the segments: 14% luxury, 35.1% upscale, 31.6% midscale, and the remaining (19.3%) in economy or multiple brands across segments. Ownership and managementmodels were represented as follows: multi-unit properties affiliated with different brands (26.3%), multi-unit properties operated by a management company (24.6%), multi-unit properties affiliated with the same brand (7%), multi-unit properties owned by the brand (5.3%),single-unit property not affiliated with any brand (24.6%), single-unit property affiliated with a brand (8.8%), and others (3.5%).

Budgets & Investment Priorities

When strategically and properly utilized, information technology can provide lodging firms with a sustained competitive advantage. Consequently, there is growing evidence that the budget for information technology spending in the hotel industry has risen over the past years. An effective way of assessing priorities is through a review of budgets. Participants of this studywere asked to report (or estimate) their organization's 2014 IT budget per single location along with the Corporate IT Budget (if applicable). Figures 1 and 2 below depict the 2014 IT budgets across the segments of the lodging industry based on the responses provided.

Figure 1. Budget ($) Per Single Location by segment

Industry segment	Mean	Median	Minimum	Maximum
Luxury	592,000	300,000	110,000	2,000,000
Upscale	286,153	250,000	20,000	700,000
Midscale	148,014	17,500	1,000	900,000
Economy	135,000	135,000	20,000	250,000
Multiple brands across segments	1,190,000	1,550,000	25,000	2,000,000
Average	470,233	450,500	35,200	1,170,000

Figure 2. Corporate IT Budget ($)by Segment

Segment	Mean	Median	Minimum	Maximum
Luxury	22,200,000	7,500,000	1,200,000	80,000,000
Upscale	1,520,000	325,000	70,000	10,000,000
Midscale	446,800	30,000	1,000	2,000,000
Economy	250,000	250,000	250,000	250,000
Multiple brands across segments	1,340,000	1,500,000	500,000	50,000,000
Average	**6,326,700**	**1,921,000**	**404,200**	**28,450,000**

In Figure 1 above, IT Budget per single location is broken-down by segments representing full and limited-service hotels in the lodging space. The reported IT budget per single location for multiple brands (across segments) ranged from $25K to $2 million per single location with an average at $1.19 million. IT budget per single location for the luxury segment hotels, as expected, leads other segments, ranging from $110K to $2 million. The wide range in the luxury budget is larger than what has been reported in previous years. The average IT budgetfor this segment is close to $600K compared to $280K last year. This figure is larger than the industry average of $470K across all segments. With no outliers observed during the analysis, it can be assumed that there will be significant IT investment across the luxury segment in 2014.

The single location IT budget for upscale properties was, on average, about $286K. For Midscale properties this amount was $148, while at $135K for the Economy segment. The wide range of variation in the reported minimum and maximum for budgets across these segments is consistentwith previous years' studies. Overall, there is clear evidence in increased allocation of funds for the IT budget across the industry. However, to get a better picture of the IT budget by segment, itwas essential to gather information on Corporate IT budgets as well.

At the corporate level, as shown in Figure 2, the budget differences among segments were even more pronounced. The reported average Corporate IT budget for each segment was:
$22.2 million for Luxury, $1.5 million for Upscale, $446K for Midscale, and $250K for the Economy segment. It should be noted that the reported averages vary from year to year based onthe profile of the organizations represented by the participants in this study and these averages are easily influenced by outliers. Also, the economy segment is rather under-represented in the study. In order to get a better sense of IT budget allocations, we asked each respondent to share their annual IT budget as a percentage of their total revenue. Overall, this figure was reported tobe 2.64%.

Where is the Budget Going?

In order get a good pulse of the industry, we have traced the IT dollars to see which IT areas they are being spent on. First, we asked our respondents to estimate the percentage of their2014 IT budget that has been or will be spent on list of key IT areas. These IT areas were previously established by industry experts. We also asked respondents to indicate approximatelywhat percentage of their IT budget are Capital Expenditures (investing in innovation) versus Operation Expenditures (maintaining systems and license fees). Figure 3 shows the distribution of funds on these areas. Despite the drum beat for innovation and repeated news article themes on the importance on investing in the technology infrastructure, operation expenditures representalmost 60% of the IT budget while capital expenditures remain at around 40%.

Figure 3. Where the budget is going

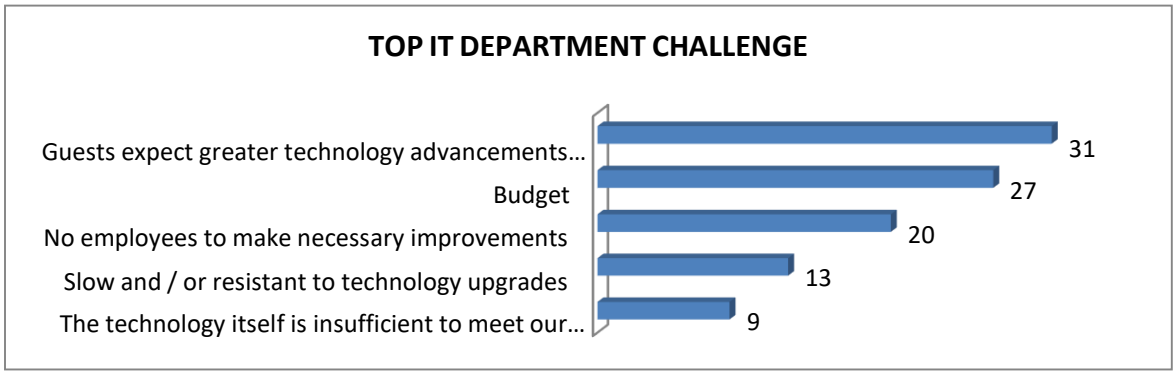
Where the budget is going (in %)	**2014**
Customer Relationship Management	6.04%
Revenue Management	6.23%
Workforce Management	6.57%
Payment Security/PCI Compliance	7.81%
Point of Sale System	8.24%
Other (staff and misc.)	11.00%
Networking/Bandwidth/Connectivity	17.35%
Guest Room Technology	17.37%
Property Management System	19.39%
Total	**100.00%**

The third highest spending in 2014 will be focused on Networking, Bandwidth and Connectivity. This is an indication that hotel executives are well aware of the importance guestsplace on being connected and that these areas are in need of improvement and updates. PropertyManagement Systems, when combined with guest room technologies and bandwidth/connectivity/networking represent half of the technology spending.

Information Technology is an important asset for all lodging companies and an integral part of the strategic management process. Large-scale information technology projects are considered as a major capital investment for any hotel operation. Respondents were asked aboutthe biggest obstacles currently facing their respective IT departments (Figure 4). In the past, budget has consistently been the top IT challenge departments faced. High guest expectations have outpaced budget limitations as the number one challenge.

The fact that one third (31%) of the respondents stating 'the guests expect greater technology advancements than hotels IT departments can reasonably keep pace with' may grow critics of Moore's law silent. Technology gadgets we have in our living rooms seem to enter into the hotel space a lot faster than they did in the past. Considering the small percent of the overall revenue IT budget represents, 27% respondents indicating budget to be a top challenge is not surprising. The third top challenge of IT departments (20%) was reported to be the lack of employees to make the necessary improvements.

Figure 4. Top IT Department Challenge



When asked about which overall strategic goals respondents' respective companies are focusing on (Figure 5), over two third (66.7%) of them indicated that they are adding bandwidth to address guest expectations. This supports the findings highlighted earlier in Figure 3 and confirms that offering connectivity to guests is indeed a top priority. Half of the respondents (49.1%) reported focusing on preparing for changes in payment technology as well as leveragingmobile solutions for customer facing applications; once again, putting connectivity in the forefront while acknowledging the need to upgrade to keep up with the changing payment security standards. Over 40% of the respondents reported focusing on securing guests' data and migrating solutions to the cloud, hence, supporting the widely reported top-trend news of the last12 months. Given the trends in emerging distribution channels, not surprisingly, 35% indicated developing a digital strategy to address changes in e-commerce. In spite of the popularity of enabling connectivity for the guests, only one out of three respondents reported focusing on to

leverage mobile solutions for employee facing applications. Considering the ever-increasing number of digital natives entering the workforce, including hospitality, leveraging mobile solutions for the employees may see an increase in terms of priority in the coming years.

Figure 5. What overall strategic goals is your company focusing on?

Overall Strategic Goals	**%**
Adding bandwidth to address guest expectations	66.7%
Preparing for changes in payment technology	49.1%
Leveraging mobile solutions for customer facing applications	49.1%
Creating a secure framework for all guest data	42.1%
Migrating solutions to the cloud	40.4%
Developing a digital strategy to address changes in ecommerce	35.1%
Leveraging mobile solutions for employee facing applications	33.3%

Besides identifying strategic IT goals, we wanted to determine the strategic role IT plays in lodging organizations by documenting how IT is perceived within these organizations. Thus, respondents were asked to review a number of IT Strategy statements previously formulated by subject matter experts and indicate if these statements are true for their respective organizations. In terms of IT strategies, 58% of the respondents stated that their organizations are seeking to be an innovator in business practices. The desire to be innovative often leads to heightened priority for IT strategies and it is welcomed news to see that there is some perceived momentum on innovation. Yet, only 42% of respondents felt that their respective organizations were seeking to be an innovator in the application of technology. This points out to a potential perceptual disconnect between technology and business practices. Further, only half of the respondents believe that the impact of senior IT leadership is equivalent to the perceived impact of non-IT leadership at their workplace. This could potentially indicate organizational culture issues in terms of how IT is perceived mainly as a support-center. Less than half of the respondents believed that IT staff was given opportunities for professional growth or involvement in non-IT tasks. A disappointing 18% of respondents reported that their organization's mission statement includes a reference to technology. The findings listed in Figure 6 points out to underlying issuesin terms of the perceived strategic role and importance of IT department and staff within lodgingorganizations.

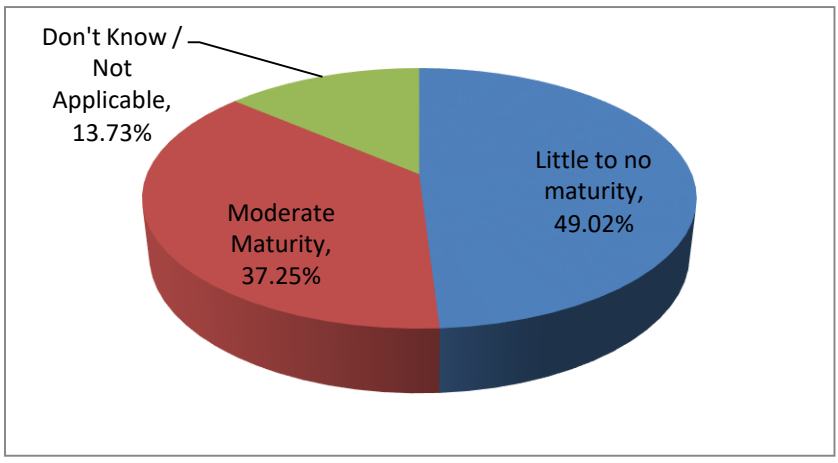
Figure 6. "IT Strategies" Which of the following statements are true at your organization?

IT Strategies	%
My organization seeks to be an innovator in business practices	58%
The perceived impact of senior IT leadership is equivalent to the perceived impact of non IT leadership in my workplace	50%
IT staff is given opportunities for continuing education via a formal program	42%
IT staff members are leveraged for project management tasks outside of traditional IT scope	42%
Our organization seeks to be an innovator in the application of technology	42%
Our organization has dedicated IT staff that operate in and report primarily to a non IT department head (e.g. marketing, operations, etc.)	34%
Our organization's mission statement includes a reference to technology	18%

Big Data Maturity

Technology is increasingly enabling hoteliers to effectively document transactions and track the behavior of guests. Through effective use of above-property and advanced enterprise systems, the lodging industry is capable of capturing more data about their guests than ever before. For the purposes of this study, Big data" was defined as information assets that are high in volume, velocity, and variety that, when captured, stored and analyzed through advanced techniques, can provide enhanced insight and decision making. The survey respondents were provided with the above definition and then asked what level of maturity their respective organizations have around processing and using Big Data to make decisions. The results are shown in Figure 7. Not only Big Data is complex as a process, there is no consensus as to what itmeans for the lodging industry. This is mirrored in the responses provided: Almost have of thosesurveyed reported little to no maturity when it comes to using Big Data for making decisions.

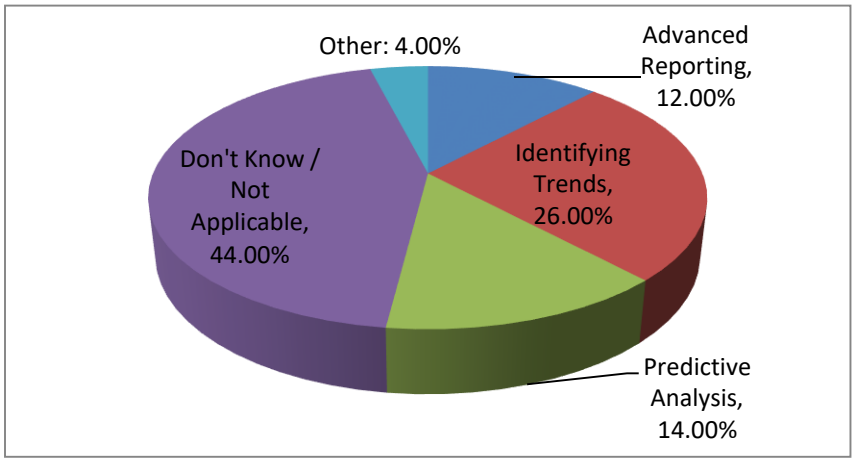
Figure 7. Big Data Maturity



Respondents were also asked how they used Big Data. Given that this is not an established technology concept for many in the lodging industry, the responses were not

surprising. 44% said they did not know, while 26% stated that it used for identifying trends. Justover a quarter of the respondents reported using Big Data for advanced reporting and predictive analysis. If Big Data is indeed the next frontier for innovation, the lodging industry needs to catch up fast to keep up with this influential technology trend.

Figure 8 - How Big Data is Used



Besides Big Data, Cloud Computing has been a topic of discussion in many recent hospitality conferences and conventions. The opportunities Cloud Computing presents became quickly evident as it is now perceived as a utility for many, especially as a SaaS. The study participants were asked if their organizations were using (or planning to use) private, public or a hybrid approach for Cloud. About equal numbers of respondents stated using private and public,with slightly less reporting the use of a hybrid approach. Few respondents indicated concerns about the ownership of data and access issues due to down-time. For the most part, the responsesindicated a better understanding of cloud technologies than Big Data.

The participants were also asked about the application they are currently running or planning to move into the cloud. Figure 9 shows the responses provided. Having plans to move an application to the cloud in 18 months wise, POS had a considerable lead over other applications with 27% of the respondents indicating plans to do so. Concierge service and eventmanagement applications seem to be the least likely applications to be moved into the Cloud. Itis safe to conclude that there is clear interest in Cloud applications but the trends is still at its early adoption stage.

Figure 9. What applications are you currently running or planning to move into the Cloud?

Question	%Do not use and no plan to move in the near future	Currently running on Cloud	Have plans to move within 18 months	Have plans to move AFTER 18 months	%Total Responses
Property management systems (PMS)	48	33	17	2	100
Revenue management systems (RMS)	51	35	12	2	100
Email	35	50	13	2	100
Central reservations systems (CRS)	55	33	8	4	100
Point of Sale (POS)	54	17	27	2	100
Customer Relationship Management (CRM)	47	41	10	2	100
Sales and catering	53	31	12	4	100
Concierge services	68	21	9	2	100
Event management applications	63	23	8	6	100
Other	67	33	0	0	100

Conclusion & Implications

This study has attempted to examine and document perceptions and opinions of hotel executives about issues and trends in information technology. Respondents have a wide variety of titles including CEOs, owners, and general managers of numerous different properties in lodging industry. The results of this study provide empirical evidence to substantiate current technology issues and trends within the lodging context. The results shows that hotel executiveshave recognized the importance of connectivity between hotel guests and hotel technologies.

Findings in this study offers an opportunity to examine the status quo of technology's influenceon the U.S. lodging industry. It is the authors hope that this benchmark study will serve as a platform from which future studies of greater depth and specificity may be undertaken.

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