An Analysis of Information Technology Publications in Leading Hospitality Journals

By Rosanna Leung and Rob Law

In response to the recent wide-scale applications of Information Technology (IT) in the hospitality industry, this study analyzed articles in leading hospitality research journals, including the International Journal of Hospitality Management, Cornell Hotel and Restaurant Administration Quarterly, and the Journal of Hospitality & Tourism Research published in the period 1985 to 2004. A total of 1,896 full-length papers were published in these journals during the study period. Excluding book reviews, research notes, and comments from editors and readers, 130 full-length IT-related papers were identified. These papers were then grouped into six defined categories of IT. The findings revealed that during the entire study period, the largest number of publications were in general business applications, whereas the highest growth rate from the first decade to the second decade were in articles on networking.

Introduction

As a tool for producing products and providing services, IT can be defined as "the use of computing and communication technology to maximize benefits to all clients" (Kirk and Pine, 1998). Although the hospitality industry is not technologically oriented, the information- intensive nature of the industry requires that IT be used to assist daily operations and business decision-making. It would be disadvantageous to organizations to be unaware of recent changes in technology and its relations to customer service (Cline and Warner, 1999). In addition, investment in IT has become an indispensable business activity in the hospitality industry. IT has been identified as not only enabling, but also inducing changes(Werthner and Kline, 1999). Frew (2000) mentioned that the hospitality and tourism industries have emphasized IT since late 1970s, and that IT has developed rapidly since then. During that time, computer operations have changed from involving heavy training to a compulsory subject in universities. Furthermore, knowing about past developments helps researchers and practitioners to understand historical patterns and to predict future trends in the development of IT and to raise the value of research. Specifically, Frew advocated that:

> "If the past 20 years have seen an emphasis on information technology (IT) per se, then the past five years have witnessed the truly transformational effect of the communications technologies ... there can be little doubt that the next 20 years will see ICT bring about a metamorphosis in the industry."

The importance of IT in hospitality has also been stated by other researchers. For instance, Buhalis (1998) argued that IT plays an important role in strategic and operational management, as it also provides opportunities and challenges for the industry. The use of IT in the hospitality industry has changed dramatically over the past few decades, shifting from a backstage supporting role to its current role as an interactive platform for guests (Nyheim, *et al.*, 2005). Hence, the hospitality industry constantly needs new technologies and innovative ideas.

As stated, the hospitality industry now requires the extensive use of IT to support their daily operations and managerial decision-making. In order to get the latest information about technology, hospitality managers choose to read articles in trade magazine as well as research journals. A natural instinct of trade magazines is to publish information that shows the sponsors in a favorable light, and that is therefore potentially biased. Articles in research journals, however, can function as an important channel providing rigorously refereed findings and unbiased viewpoints on analyses and evaluations of technology. Academic researchers have published many empirical and theoretical papers on the development of technology. These publications have helped suppliers of technology suppliers by saving them

a large amount in development funds. Similarly, hospitality managers can apply the new academic findings to their business environments in order to enhance operational efficiency, reduce costs and, more importantly, improve the quality of their services. In other words, academic researchers strive for new knowledge that can be directly or indirectly applied to the hospitality industry. Analyzing research endeavors in leading hospitality research journals can, therefore, reflect the growth and trend of IT applications in the hospitality industry. Despite the need for such an analysis of published IT articles, there have been only a very small number of studies in which such an attempt has been made. In other words, it remains largely unknown to what extent various types of IT have been of interest to academic researchers in the past 20 years during which the global hospitality industry has experienced rapid growth. Baker and Riley (1994) put forward a similar argument that the literature in service industries has been unable to establish the relationship between the use of technology and its impact on productivity. To obtain a more in-depth understanding of such a potential gap between the industrial setting and academic research, it is important to carry out a content analysis of published articles.

The primary objective of this paper is to analyze the progress of different types of IT research papers published in leading hospitality journals in the period 1985 to 2004. Having introduced the background of this study in the previous paragraphs, the following section of this paper reviews related literature on publications in research journals. The section after that describes the methodology used in this study. Next is a section presenting the empirical findings. The last section of this paper concludes the study, and discusses its implications.

Literature Review

It is generally agreed that research journals are a channel for the dissemination of high-quality and rigorously reviewed articles in specific academic fields (Sheldon, 1889). Schmidgall and Woods (1993) performed an analysis of the ratings of different publication channels and found that research journals are the most important such channel. Thus, academic journals play an important and significant role in the world of research. These journals also reveal the direction and nature of research in a field, as they are essential for generating and disseminating new knowledge (Perchlaner, *et al.*, 2004). Heck and Cooley (1998) further stated that the development of literature can reveal the degree of maturity of the field and the codification of contributions, which subsequently influence perceptions within the academic and industrial communities. In addition, universities largely believe that the quality of their research output will directly enhance the reputation of their programs, and that this will eventually help them to get support from industry (Eder and Umbreit, 1988).

In the past twenty years, the number of hospitality and tourism journals has increased significantly. In the early 1980s, there were only 24 journals in the fields of hospitality and tourism, but this number increased to more than 100 in 2002 (Hsu and Yeung, 2003). Although the increasing number of academic journals reflects the active participation of researchers in hospitality and tourism, the quality of such journals is also an important concern for educators, researchers, and practitioners. Pechlaner *et al.* evaluated twenty-two tourism and hospitality journals for practical relevance, scientific relevance, overall reputation, readership frequency, and their importance for professional careers. Similarly, Ferreira *et al.* (1994) performed a survey involving directors of 120 institutes that offered four-year hospitality programs in the United States on their views of 15 hospitality journals. Recently, Law *et al.* (2005) carried out a survey with 520 scholars from 195 universities around the world to seek their perceptions of the quality of 88 hospitality and tourism journals.

Some hospitality researchers have performed content analyses on hospitality journals. For instance, five hospitality journals that were published in 1983 to 1989 (Balogu and Assante, 1999) and in 1990 to 1996 (Crawford-Welch, 1992) were examined for subject areas and

research techniques. Chon *et al.* (1989) conducted a content analysis on the hospitality management literature appearing in four journals from 1967 to 1986. These studies examined the journals for different research areas and the types of research methodology adopted. A similar study was performed by Bowen and Sparks (1998), which categorized hospitality marketing into nine sub-categories and analyzed the content and research methodologies from eight major hospitality journals in the period 1990 to the first half of 1997.

Kluge (1996) reviewed the literature on IT in hospitality curriculum. This research examined a total of 102 IT articles related to hospitality curriculum in seven journals. These articles were grouped into 12 subject areas in relation to IT in education, curriculum development, and educational contents. In addition, Kirk and Pine categorized IT research into six areas including IT development, technologies, types of technologies, technology transfers, future predictions, and methodological approaches. However, the broad extent of this categorization made it difficult to analyze specific technological changes. Frew conducted a survey in relation to information and communications technologies from a database that originated from a specific research project that analyzed the content of IT publications using 15 keywords during the period 1980 to 1999. It is interesting to note that the some general keywords were also used in the study, such as hotel, computing, and reservations. Another study performed by O'Connor and Murphy (2004) analyzed articles in IT publications published in 12 research journals over a period of 19 months. The study classified the IT publications into three main areas, including IT and distribution, IT and pricing, and IT and hospitality customers. Although the findings of the study period were appealing, the time span of the investigation appeared to be too short, making it difficult to draw any conclusions on changing trends.

As advocated by Khan and Olsen (1988), young and developing fields need more rigorous research. Nonetheless, there seems to be no clear direction on what has been done, and therefore, what needs to be done in IT research in hospitality. Along with its rapid development, IT is expected to bring dramatic changes to the hospitality and tourism industries (Frew). Hence, it is important to give an overview of what has been done in IT research in the context of hospitality. As a last comment, many prior content analyses of research journals have concentrated on authorship rankings, analyzing research methodologies, and keyword analyses. These studies, however, do not offer enough information on specific types of technological usage.

Methodology

This study aims to investigate the changes in IT publications in the leading research journals in hospitality in the period 1985 to 2004. Based on previous studies (*Op. Cit.* and Howey, *et. al., 1999)*, the three leading hospitality research journals have been identified as being *International Journal of Hospitality Management (IJHM),* the *Cornell Hotel and Restaurant Administration Quarterly (CQ),* and the *Journal of Hospitality & Tourism Research (JHTR)*. This study only analyzed full-length papers, and excluded book reviews, research notes, abstracts, comments from editors and readers, conference reports/reviews, rejoinders, and viewpoints. This study analyzed research papers that were published between 1985 to 2004. During this period, the hospitality industry experience rapid changes and development. Within the period under study, it should be noted that the *JHTR* underwent a couple of name changes, to the *Hospitality Education & Research Journal* from 1985 to 1989, the *Hospitality Research Journal* from 1990 to 1997, and the *Journal of Hospitality & Tourism Research* since 1998. For consistency, these journals are all referred to in this paper as *JHTR*.

Buhalis (1998) categorized the components of technology into four different categories: networking, information management, intelligent applications, and user interface. These four categories basically cover the various aspects of technology, but not general business

applications. In addition to the inclusion of the modified categories as presented by Buhalis, two new dimensions of general business applications (GBA) and miscellaneous were added. The components in GBA were based on the respective studies by Sheldon (1997) and Inkpen (1998), which included software and applications used by the industry along with guest-operated devices.

To ensure that the proposed categories fully covered industrial IT components, the list was reviewed and validated by a group of seven industrial professionals. Four of the professionals were hotel IT managers, each with more than ten years of working experience in the industry; two were IT managers in travel agencies with at least five years of working experience; and the last one was a systems specialist who had worked for a property management system vendor for more than 15 years. Table 1 shows the six categories and the corresponding attributes.

Table 1: Six categories of information technology components

Networking - ISO/OSI - Internet - SGML - World Wide Web - Hyper Text Markup Language - XML - Cryptography - GSM - WAP - ATM ←→ IPv6 - System Architectures - Client-server - Distributed and mobile computing	**Information Management** - Database, relational, object-oriented - Multimedia - Data modeling - Data mining and warehousing - CRM - Unified Modeling Language (UML) - Programming languages - Information search - Computer Supported Cooperative Work (CSCW) - Authoring tools - Participatory design
Intelligent application - Artificial intelligence - Logics - Optimization - Simulation - Statistics - Knowledge discovery and data mining - Learning systems - Agents - Artificial life	**User Interface** - What You See Is What You Get (WYSIWYG) - Multimedia - Windowing - User modeling - Natural language processing - Metaphors - Visualization - Adaptive interfaces
General Business Application - Property Management Systems (PMS) and Interfaces - Point-of-Sales Systems (POS) - Restaurant Management systems - Call accounting Systems (CAS) - In-room Systems - Computerized reservation Systems (CRS) - Self-Service kiosk Systems - Reservation Systems - Yield Management Systems	- Food and Beverage Systems - Back-office Systems - Sales and Marketing Systems - Travel Information Systems - Global Distribution Systems (GDS) - Tourism information Systems - Destination Information Systems - Video-conferencing - Telecommunications
Miscellaneous - Any topics that do not fit into one of the above five categories	

The identified IT-related publications were then grouped into the appropriate categories as presented in Table 1. It is necessary to mention that the contents of certain articles did fall into more than one category.

Findings and Discussions

Analysis according to Journals

In total, 1,896 full-length research papers were published in all three research journals during the period from 1985 to 2004. *CQ* had published the most full papers (n=901), followed by the *JHTR* with 576 papers, and *IJHM* with 419 papers, the smallest number.

Among the three research journals, *CQ* had the highest ratio of published IT papers. Within the study period, *CQ* published 68 IT research papers out of a total of 901 papers (7.55%); followed by *JHTR* and *IJHM*, which published 37 and 26 IT papers from a total of 576 and 419 research papers, respectively (6.42% and 5.97%). (Table 2)

Table 2: IT publications in leading research journals

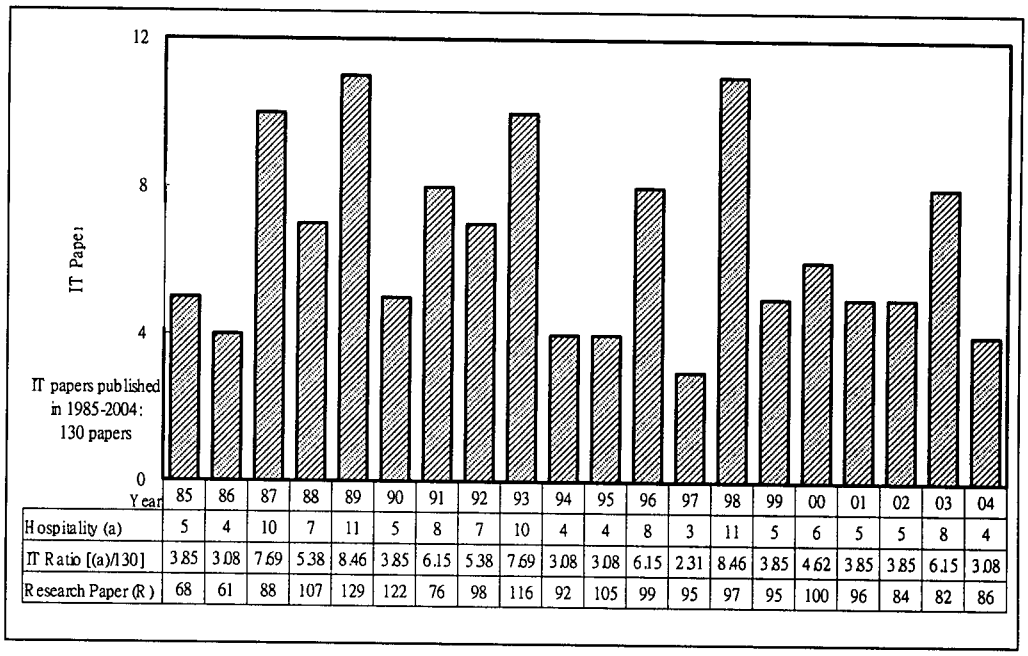
Journal	Total Research Papers (a)	Total IT papers (b)	(b) / (a)	(b) / (c)
IJHM	419	25	5.97%	19.23%
CQ	901	68	7.55%	52.31%
JHTR	576	37	6.42%	28.46%
Total	1,896	130 (c)	6.86%	100.00%

The most popular IT category within the whole study period was GBA, which had 41 occurrences. As the Internet has become more popular, networking was ranked the second most productive research area with 30 occurrences, which was followed by intelligent applications with 27 occurrences. Information management ranked fourth with 16 occurrences, and 12 papers were in the user interface category. In addition, about 20% of the IT papers fell into the category of miscellaneous, with 32 occurrences. In total, *CQ* had published the most number of IT papers in all six categories. *JHTR*, in turn, outperform *IJHM* in terms of the number of IT publications.

Distribution of IT papers published

The total number of full-length research papers in the selected journals increased from 68 papers in 1985 to 86 papers in 2004 (Figure 1). The number of IT papers, however, did not show a major increase during the study period. On average, 94.8 full-length research papers were published annually, of which 6.5 were IT papers. During the period from 1985 to 2004, the least productive year for full-length papers was 1986 with a total of 61 research papers, and the most productive year was 1989 with a total of 129 papers published. For IT papers, the most productive years were 1989 and 1998 with 11 IT papers published each year. However, the number of IT papers appears to drop in 1994 and 1995. In 1997, the number of IT papers dropped to the lowest level of three papers. One of the possible reasons for this was the establishment of the ENTER Conference organized by the International Federation for IT and Travel & Tourism (IFITT) commencing from 1994. The ENTER Conference is the world's largest tourism and IT conference, and attracts many IT research papers from other research journals (IFITT, 2005). Moreover, with the introduction of journals specializing in hospitality and tourism IT, including the *Information Technology and Tourism* published in 1998 and the *International Journal of Hospitality Information Technology* published in 1999, some IT research papers were submitted and eventually published in these journals.

Figure 1: Distribution of IT papers from 1985-2004



Year	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
Hospitality (a)	5	4	10	7	11	5	8	7	10	4	4	8	3	11	5	6	5	5	8	4
IT Ratio [(a)/130]	3.85	3.08	7.69	5.38	8.46	3.85	6.15	5.38	7.69	3.08	3.08	6.15	2.31	8.46	3.85	4.62	3.85	3.85	6.15	3.08
Research Paper (R)	68	61	88	107	129	122	76	98	116	92	105	99	95	97	95	100	96	84	82	86

Analysis of IT Categories

Since each paper might cover more than one IT category, the total count in IT categories was 158, which exceeded the total number of IT papers of 130. Table 3 lists the number of IT publications in the selected journals.

Table 3: Distribution of IT papers in each category and in each journal

	Networking	Information Management	Intelligent Applications	User Interface	General Business Applications	Miscellaneous	Total
IJHM	4	1	7	1	6	8	27
CQ	21	12	11	7	25	10	86
JHTR	5	3	9	4	10	14	45
Total	30	16	27	12	41	32	158
%	18.99%	10.13%	17.09%	7.59%	25.95%	20.25%	100.00%

The most popular IT category within the whole study period was GBA, which had 41 occurrences. As the Internet has become more popular, networking was ranked the second most productive research area with 30 occurrences, which was followed by intelligent applications with 27 occurrences. Information management ranked fourth with 16 occurrences, and 12 papers were in the user interface category. In addition, about 20% of the IT papers fell into the category of miscellaneous, with 32 occurrences. In total, *CQ* had published the most number of IT papers in all six categories. *JHTR*, in turn, outperform *IJHM* in terms of the number of IT publications.

Analysis of different decades

Table 4 shows the IT publications in the first decade (1985 – 1994) and second decade (1995 – 2004). In the first decade (1985-1994), GBA produced the largest number of IT papers (29.55% of all IT papers). The dominance of IT publications in the second decade, however, was taken over by networking, comprising 28.57% of all publications on IT. The number of GBA publications dropped from 26 papers in the first decade (29.55%) to 15 papers in the second decade (21.43%). Likewise, the number of papers on intelligent applications experienced a large drop from 19 papers in the first decade (21.59%) to 8 papers (11.43%) in the second decade. In addition, two less papers were produced in each of the categories of information management and user interface.

Table 4 Research categories in hospitality journals in different decades

		Networking	Information Management	Intelligent Applications	User Interface	General Business Applications	Miscellaneous	Total
number	1985-1994	10	9	19	7	26	17	88
	1995-2004	20	7	8	5	15	15	70
%	1985-1994	11.36%	10.23%	21.59%	7.95%	29.55%	19.32%	100.00%
	1995-2004	28.57%	10.00%	11.43%	7.14%	21.43%	21.43%	100.00%

Research on Networking

The first networking paper published in *CQ* was entitled "Computer Confusion", and was co-authored by Cummings and Robinson in 1986. However, only the final part of this paper discussed the LAN setting. The second networking paper was published four years later in 1990, also in *CQ*. Prior to 1993, none of the published papers focused on networking, as sections of the networking papers were either in GBA or intelligent applications. The first "true" networking paper, coauthored by Moore and Wilkinson in 1993, was entitled "Communications Technology", and appeared in 1993 in *JHTR*. Frew commented that there were no Web-related publications prior to 1994. As Internet applications increased, more research papers were published on networking. In total, 85.71% of the papers on networking were related to the Internet or the World Wide Web (WWW). The first Web-related paper was published in *CQ* in 1996. It was entitled "Restaurant Marketing on the Worldwide Web" and was written by Murphy *et al.* (1996). The most noticeable change in this category was the large increase in the number of publications in the second decade (from 10 to 20). This showed the effect of the downsizing of computer systems from mainframe computers and minicomputers to networked personal computers, the increasing use of Internet applications and, more importantly, the optimization of resource sharing. Law and Jogaratnam (2005) made a similar claim that hotels at present find the Internet to be the mot useful technology.

Research on Information Management

IJHM published the first paper on this topic, entitled "Information technology supporting fast food phone-in order responsiveness". The paper was authored by Cummings in 1987, and related to the application of IT in managing marketing information. The most frequently occurring topic in this category was Customer Relationship Management (CRM) and database marketing, comprising 34.62% of the published articles. The second most popular topic was searching for information (19.23%), followed by using multimedia as training media (15.38%). Overall, information management did not seem to be a "trendy" category in

the period under study, as only 16 papers were published and no significant changes in the number of papers was seen between the first and second decades.

Research on Intelligent Applications

A total of 27 IT papers (17.09%) were published in the category of intelligent applications. The first paper on this topic was published in 1986 by *IJHM*. It was entitled "Expert front office management by computers" and was written by Gamble and Smith. Within the study period, one-third of the published papers were related to expert systems and eight were on yield management (29.62%). In 1987, intelligent applications were the most popular category, with five papers on the topic appearing in the selected hospitality journals. Once a fad, the number of published papers on intelligent applications dropped dramatically from 19 in the first decade to only eight in the second decade. Basically, no research paper in this category was published after 1999 except for one paper in 2004 that appeared in *CQ*.

Research on User Interfaces

Apparently, user interfaces was the least popular research category. Within the entire studied period, only 12 papers were published in this category. The first published paper was authored by Harris and entitled "Employee training: Using high tech & videodisc technology". It appeared in 1988 in *JHTR* (originally the *Hospitality Education & Research Journal*). Of all twelve papers, seven were related to training and education. The most productive year in this category was in 1993, during which four papers were published.

Research on General Business Applications (GBA)

This appeared as a much-needed research category during the study period. Written by Patterson and Alvarez in 1985, the first paper published in this category appeared in *CQ* and was entitled "Computer systems for food-service operations". In the first decade under study, the research articles focused mainly on the operation of IT devices. Their contents were mostly descriptive in nature and aimed to reveal the general concepts and operation of computers (both hardware and software) as well as the implementation of IT. Ever since personal computers have become an essential tool at work and at home, IT has become a compulsory subject at school and most people can thus acquire a basic knowledge of computer operations. Hence, research in the second decade moved to the analysis of new technologies and the strategic use of IT in hospitality. With these significant changes in the development of IT, GBA underwent some significant changes. With the increasing use of computer networks, the operating platforms of many business applications changed from local servers to Internet-based servers. This, in turn, caused a significant decrease in the number of publications in this category.

Conclusions

It is generally agreed that IT can be used in the hospitality industry to enhance operational efficiency, reduce costs, and provide better service to customers. However, among the published full-length articles, the percentage of IT papers is still very low (6.86%). This finding suggests that not enough effort has been spent on researching this important area, and that it is necessity for hospitality researchers to conduct more studies on IT related projects in order to meet the needs of industry.

In addition about 20% of the IT papers were found to be theoretical and descriptive in nature. O'Connor and Murphy argued that future research should have more "field experiments to show causality, and [rely] upon actual behavior rather than intended behaviour". They quoted an example of the development of restaurant and food service management affected by new IT, but no article has been published on such a topic in any high-quality research journal for 18 months.

In terms of decades, the numbers of IT papers published in the first and second decades were 71 and 59 papers, respectively. However, the total number of full-length research papers

increased slightly from 957 papers in the first decade to 939 papers in the second decade. The percentage of full-length papers in IT publications dropped from 7.42% to 6.28% from the first to the second decades.

Research journals in hospitality basically share the similar goal of publishing peer-reviewed scholastic information that helps to advance the development of knowledge in hospitality-related industries. One of the major target groups of readers for these journals is industrial professionals in hospitality. At least, the leading hospitality journals included in this study aim to have practitioners, among others, as their readers. A noticeable gap, however, is the composition of reviewing panels for the submitted articles. In many cases, only academic reviewers are invited to serve as reviewers. While agreeing that comments from academic reviewers can help maintain research rigor, if hospitality practitioners are not involved in the evaluation process, the extent to which industrial professionals accept the research findings (or approaches) will remain unknown. In other words, it is very difficult, if not impossible, to determine whether the published articles in hospitality journals have any applicability to the related industry.

In the context of hospitality information technology, empirically based papers with demonstrated industrial applications would be more important and useful than conceptually based papers. It has been said that IT capabilities are often limited by the background, ambition, and attitude of hospitality managers instead by the technology (Law and Lau, 2000). Moreover, as most hotel managers are not technically competent, the adoption of IT systems by hotel managers without enough background knowledge often leads to frustration, disappointment, and eventual abandonment of the systems (Law, 198). This paper, therefore, suggests that hospitality researchers be obligated to offer professional advice to industrial practitioners through proven research outcomes. Lastly, as information is essential to hospitality managers at virtually at all levels, IT should be able to do more than assist with operations. IT can, and should, be part of the management strategy that emphasizes high-quality services in the hospitality business. However, such an event will only occur when hospitality managers can make full use of IT.

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