

AN ASSESSMENT OF THE EFFECTS OF  
TECHNOLOGY IN OKLAHOMA  
LODGING PROPERTIES

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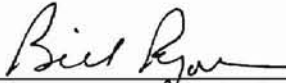
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## DEDICATION

This thesis is dedicated to my parents, Ahmet and Sukran Cobanoglu

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## CHAPTER I

### INTRODUCTION

Information technology has played an increasingly important and dominant role in every part of life, both personally and professionally (Kluge, 1996). As a result, technology has become extremely important for the hospitality industry. In the lodging industry, product differentiation through marketing has become challenging. As product differentiation and marketing become more complicated, lodging properties have been forced to consider quality of service as a major competitive factor (Marshall, 1988; Reid & Sandler, 1992).

Researchers such as Reid and Sandler (1992) concluded that lodging companies use technology to improve guest satisfaction. Similarly, David, Grabski and Kasavana (1996) suggested that “hotel companies believed that information technology helped improve the quality of business operations” (p.68).

Hoof, Combrink, and Verbeeten (1997) stated that global competition, a shrinking marketplace, and growing emphasis on service and quality make the use of technology virtually mandatory for lodging operations. A study conducted in 1995 by Hospitality Information Technology Association (HITA) and PKF Consulting company revealed that 95.3 percent of the lodging properties in the United States use some kind of computer technology (Hoof, Hubert, Collins, Combrink, & Verbeeten, 1995). Another study by

Parets (1997) suggested that most mid-market and budget extended stay hotels depended on technology more than any other type of hotel because they did not employ a large staff. In this situation there were fewer people to check in customers, answer phones, and assist travelers on a 24-hour basis.

There were other substantial benefits associated with the use of technology in the lodging industry identified by researchers such as reduced training costs, lower ongoing support costs, higher productivity, improved employee knowledge, integration of various departments, speedier communications, and better strategic development and growth ( Reid & Sandler, 1992; Hoof, Hubert, Collins, Combrink, Verbeeten, 1995; Cahill, 1997). Although increased utilization of technology may benefit the lodging property as a whole, David, Grabski and Kasavana (1996) suggested that technology does not necessarily increase hotel productivity in each department.

#### Statement of the Problem

Little information is known regarding the factors that impact the utilization of technology in Oklahoma lodging properties.

#### Statement of Purpose and Objective

The purpose of this study was to assess the factors that impact the utilization of technology currently used by Oklahoma Lodging properties. The objective of this study was to report information that would be useful to lodging operators who are confronted by the need to make decisions regarding the use of technology in their properties. The information discovered through this study will be used to help to produce a report and

training program concerning the utilization of technology applications in lodging operations.

### Research Questions

1. What technology applications are used in Oklahoma lodging properties?
2. Do technology applications have an effect on customer satisfaction in Oklahoma lodging properties?
3. Do technology applications have an effect on employee productivity in Oklahoma lodging properties?
4. What are other factors that impact the utilization of technology in Oklahoma lodging properties?

### Limitations

The study was limited to general managers of Oklahoma lodging properties. The population utilized was one limitation of this study. The results of this study can not be generalized beyond the population.

### Assumptions of the Study

It was assumed that respondents completed the questionnaire objectively, according to their professional work and that each respondent's perception of technology applications was related primarily to the position that he/she occupied in the industry setting. Another assumption was made that the respondents were not biased or influenced

by the use of Oklahoma Hotel and Motel Association letterhead on the cover letter for the instrument.

### Definition of Terms

For this study, the following terms were defined so that the researcher's intent was understood.

1. Technology Applications: Any hardware and/or software including internet applications used in lodging properties. Appendix A lists definitions for each of the 50 technology applications included on the questionnaire.
2. Lodging Properties: Business represent themselves as one of the following: Hotels, Resorts, Conference Centers, Motels, Extended Stays, Convention Hotels, All Suites.
3. Members: The lodging properties that are members of Oklahoma Hotel and Motel Association (OHMA). Membership in American Hotel and Motel Association (AHMA) is included with membership in OHMA.
4. Non-members: The lodging properties that are not members of OHMA and AHMA.

### Structure

This study was organized into five chapters. The first chapter included an introduction, statement of problem, purpose and objective of study, limitations, assumptions, and definitions of terms. The second chapter contained a review of literature. The third chapter included the methodology, an explanation of the sample, and a description of the development of the questionnaire. The fourth chapter included

analysis of the data and chapter five developed conclusions and recommendations for future research based on the results of this study.

## CHAPTER II

### LITERATURE REVIEW

#### History of the Lodging Industry

The concept of hospitality is as old as civilization itself although where or when the first inns and eating-places actually originated is unknown (Walker, 1996; Lane & Dupre, 1997). A complete history of the lodging industry would go back 12,000 years. However, the inn-keeping as we know today was not developed until the adoption of a standardized medium of exchange. The use of money during the sixth century B.C. caused people to trade and travel. As travelers' geographic areas of movement widened, their lodging needs become greater (Lattin, 1989). The first inns provided only little space with no or minimal attention to travelers.

Indications of hospitality and lodging properties has been found in writings dating back to ancient Greece and Rome, beginning with the code of Hammurabi. In these writings, there was evidence that taverns were also houses of pleasure (Lattin, 1989). English inns gained the reputation of the finest in the world. In the American colonies, early inns were located in seaport towns and were patterned directly after those in England. American innkeepers were aggressive expansionists and within a few years of the Revolution, American inns were offering fine service just as those in England.



In 1794, the City Hotel, the first building that was built specifically for hotel purposes opened in New York City (Lattin, 1989). The cities of Boston, Baltimore, and Philadelphia opened their first hotel establishments right after the City Hotel. In 1821, a first class hotel, The Tremont House, was opened in Boston with 170 rooms. After the Tremont Hotel, many other finer hotels were built in the United States during the nineteenth century. At the beginning of the twentieth century:

The hotel industry was confronted with the challenge of serving a new traveling population. It had to face such questions as: What types of accommodations were needed by the traveling salesperson? Were new services necessary?...Answers to those questions were not immediately available. Fortunately for the industry, Ellsworth M. Statler had foreseen the development of this situation and was ready to meet the challenge himself; while leaders in the field were discussing the alternatives, he was drawing plans for his first hotel. By 1907, construction was under way in Buffalo on the Statler Hotel.

The opening of the Buffalo Statler on January 18, 1908, marked a new age in the American Hotel industry; this was the birth of the modern commercial hotel. This 'invention' (for as truly as Henry Ford invented the modern automobile, Ellsworth Statler invented the modern hotel) embodied all the known techniques of the day plus a lifetime of Statler's own experiences and ideas, which he had carefully recorded. (Lattin, 1989, p. 45).

In 1920's, there was a great deal of hotel construction in the United States. With the depression in 1930, the hotel industry was negatively affected. The biggest effect of the Depression was that eighty-five percent of the nation's hotels either went into receivership or through some form of liquidation (Lattin, 1989). By 1940 the hotel industry had started to recover from the effects of the Depression. After the 1950s, with the advances in automobile industry, more American families started to travel and many new motels and motor hotels were built. After 1970 several factors and developments influenced the US lodging industry. Two of the primary factors were market segmentation and advanced technology.

## Market Segmentation

The successors to the traders or merchants of the past who searched for and found solutions to people's needs and wants were called marketers (Lattin, 1989). The first age in the evolution of marketing was production a product regardless of whether that product was needed and wanted. The second age was when manufacturers determined the needs and wants of the potential customers and developed a product according to those desires.

In 1960 and 70's, lodging property managers started to use modern marketing concepts to assess the desires of the potential customers. However during this period, for the majority of lodging managers, marketing was not very important. In the 80's, the importance of marketing increased relative to other management functions because of intense competition and an economic downturn in the hospitality industry (Lattin, 1989).

Prior to 1980, the lodging industry was categorized into four main segments: luxury hotels, commercial hotels, resort hotels and motels/motor hotels (Lattin, 1989). As increased competition became a permanent factor in marketing strategies, the importance of segmentation increased. Lattin (1989) indicated how diversified the lodging industry has become:

Increased airline travel has brought hotels to airport locations. Catering to the business traveler who wants to attend meetings without fighting city traffic, these properties offer convenient locations. New emphasis has been placed on the center city. Every major metropolitan area in the United States can boast of new architecturally splendid hotels aiding in the revitalization of downtown areas. Many properties cater to large group and convention business. They may offer meeting rooms, exhibit areas, or very large special function space, or they may be located close to other properties which offer these facilities... Other travelers desire budget accommodations. The fastest growing segment of the lodging industry offers very clean, new, attractive and comfortable facilities. Between 1970 and 1988, the economy segment increased by 1,200 percent... Many travelers like "home away from home"; others enjoy more space than offered in most properties. Suite hotels and residence inns offer living areas separate from sleeping rooms, as well as kitchenette facilities. The all-suite sector is second only to the economy group in rate of growth...(pp.50-52).

### Advanced Technology

Lattin (1989) indicated that the computer and other advanced technologies caused a technological revolution in the hospitality industry. According to Kasavana (1997) :

During the past new decades, nothing has enhanced the professionalism nor increased the productivity of the hospitality industry more than technology. Computers have changed the way hotels, restaurants, clubs, and casinos plan, coordinate, evaluate, and control their operations. (p. 10)

Accounting departments were one of the first departments that started to use computer applications. Front desk operations and computerized reservations systems quickly followed. Hotels adopted the technology available to meet the needs of a emerging customer base. As business travelers need to have more technology readily accessible lodging properties started to provide fax machines, voice mail devices, and telephone jacks for personal portable computers in rooms (Lattin, 1989).

### Expected Growth

Hoteliers are no longer dependent on metal reservation and customer information racks, a collection of mechanical equipment, or a set of routine clerical tasks (Kasavana, 1997). Continuous developments in the technology, both hardware and software, available to the lodging industry has significantly effected both front and back office procedures. From the moment a potential customer visit property's website to reservations and final settlement of their accounts, a computer system is capable of monitoring, charting, and recording all transactions between guests and the hotel. In the future, new technological developments are expected to continue at a rapid rate and take the hospitality industry into the new millennium (Hoof et al., 1995; Kasavana, 1997). Chervenak (1993) and Hoof et al. (1995) predicted that technology will continue to play a dominant role in the

operation of the lodging properties and be an integral part of any lodging operation as the customers will be more time-constrained.

## Customer Satisfaction

Yi (1991) indicated that customer satisfaction can be defined either an outcome or a process. Customer satisfaction defined as an outcome characterized the end-state that resulted from the consumption experience. A description of this definition provided by the following authors.

The buyer's cognitive state of being adequately or inadequately rewarded for the sacrifices he has undergone. (Howard & Sheth, 1969, p. 145)

An emotional response to the experiences provided by, associated with particular products or services purchased, retail outlets, or even molar patterns of behavior such as shopping and buyer behavior, as well as the overall marketplace. (Westbrook and Reilly, 1983, p. 256)

Alternatively, customer satisfaction has been described as a process, that emphasized the perceptual, evaluative, and psychological processes that contribute to satisfaction through:

An evaluation rendered that the experience was at least good as it was supposed to be. (Hunt, 1977, p. 459)

An evaluation that the chosen alternative is consistent with prior beliefs the with respect to that alternative. (Engel & Blackwell, 1982, p.501)

Yi also observed that the definitions of customer satisfaction varied with regard to their level of specificity. The various levels identified included satisfaction with a product, a purchase decision experience, a performance attribute, a consumption experience, a store or institution, or a pre-purchased experience.

### Importance of Customer Satisfaction

The 1998 American Customer Satisfaction Index revealed that customers saw satisfaction as one of the most important factors when selecting a lodging property (Whitford, 1998). The study also indicated that the overall customer satisfaction of the lodging industry had declined and was lower as related to the all the other components of the service industry identified in this study. The author suggests that technology can be a key factor in increasing the customer satisfaction in lodging properties. Another study by Shifflet and Bhatra, (1997) suggested that there were two principal factors which influenced the customer decision regarding which hotel brand to choose: satisfaction and price.

A 1994 survey conducted by the Juran Institute found that 90 percent of the senior managers of more than 200 of America's largest companies agreed with the statement, "Maximizing customer satisfaction will maximize profitability and market share." (Fay, 1994). Mentzer, Bienstock and Kahn (1995) surveyed 124 large U.S. companies and found that 75 percent of the companies surveyed mentioned customer satisfaction in their mission statements. Almost half of the mission statements of the companies surveyed addressed customer service (56 percent) and a customer orientation issues (49 percent). Companies see the customer satisfaction issue as important and each year they allocate more budget resources to customer satisfaction measurements, see Figure 1 (Honomichl, 1996). In the case of measuring relatively less customer satisfaction, the management and the operations are examined and the reasons for this decline in customer satisfaction are searched: (Honomichl, 1996).

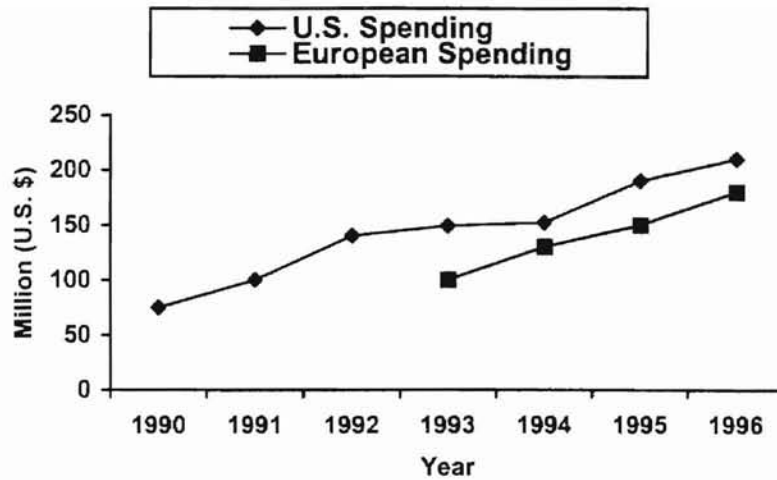


Figure 1. Spending on Customer Satisfaction Measurement by Companies in the U.S and Europe

Maximizing the Satisfaction of Customers

Customer satisfaction has a long-reaching impact on the current and future viability of an organization (Vavra, 1997). Schlesinger (1982) identified relationship between satisfied customers and satisfied employees with the Cycle of Good Service (see Figure 2).

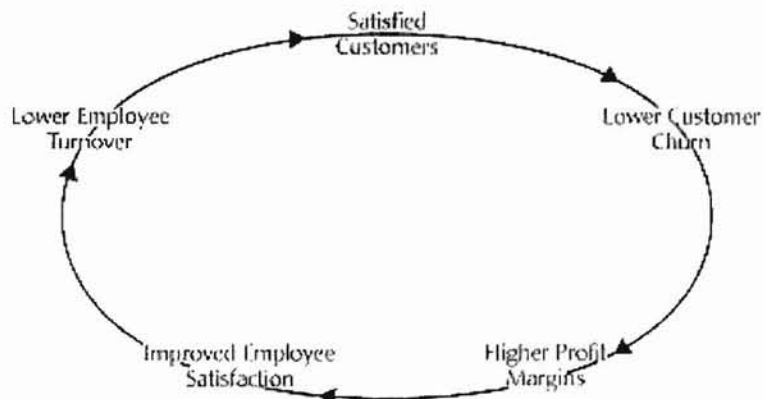


Figure 2. The Cycle of Good Service (Schlesinger & Heskitt, 1991)

The cycle suggests that satisfied customers tolerate higher costs that could be used to pay employees better. This philosophy increased employee morale and significantly reduced employee turnover, which in turn resulted more satisfied customers, and so on.

### Employee Productivity

Productivity is a summary measure of the quantity and quality of work performance with resource utilization considered. The traditional economic definition of productivity focuses on the ration of product or service outputs to resource inputs. Sample productivity indices are output per person-hour (business), clients served per staff member (social agency), and student credit hours taught per full time equivalent faculty member (university)...Productivity involves doing a job or task in the best possible way all of the time. Achieving productivity requires the creative combination of appropriate technology and skilled people into a well functioning total performance system. (Schermerhorn, 1989, p. 17).

Schermerhorn (1989) suggested that there were two criteria which measured an employee's success in the quest for productivity and personal accomplishment: performance effectiveness and performance efficiency. Performance effectiveness was defined as a measure of task, output, or goal accomplishment. Performance Efficiency was defined as a measure of the resource cost associated with goal accomplishment or outputs compared to the inputs consumed.

### Productivity and Quality of Working Life:

The issue of resource utilization was related significantly to productivity through social and humanistic values. Employees achieve productivity through high performance

(effectiveness and efficiency) and gain a sense of personal satisfaction (Schermerhorn, 1989). Both performance and satisfaction can result when employees work with individuals and groups that achieve high productivity. Quality of Working Life (QWL) was defined by Schermerhorn (1989) as an indicator of the overall quality of human experiences in the workplace and related closely to productivity. Attempts to increase productivity should reflect the QWL because a high QWL can benefit the employee in the following ways:

- Adequate and fair pay for a job well done.
- Safe and healthy working conditions
- Opportunity to learn and use new skills
- Room to grow and progress in a career
- Social integration into the organization
- Protection of individual rights
- A balance of work and non-work demands
- Pride in the work itself and the organization (Schermerhorn, 1989, p. 20)

## Franchising

Independent, non-branded lodging properties exist in many states. However, the majority of the lodging properties in the United States hang the flag of a corporate or brand to ensure quality and attract guests. The organizational concept behind these flags or brands is franchising.

Keup (1990) defined franchising as :

A method of market expansion utilized by a successful business entity wanting to expand its distribution of services or products through retail entities owned by independent operators using the trademarks or service marks, marketing techniques, and controls of the expending business entity in return for the payment of fees and royalties from the retail outlet. Essentially, the franchisee is a substitute for the franchisor's company-owned office in the retail distribution of the franchisor's services or products. The success or failure of one party to this



unique relationship generally determines the success or failure of the other party. If the franchisor and franchisee keep this business-relationship definition in mind, the self centered attitudes that appear to arise under legal definition can be avoided. (pp. 1-2).

### Franchisor Requirements

When the franchisor and franchisee sign the contract and agreement, the franchisor asks the franchisee to perform special services in specific settings as required by the franchisor. The franchisor may require the franchisee to:

1. use certain number of managers, assistant managers, and employees.
2. advertise locally or participate national campaigns (certain percentage of the gross income).
3. purchase certain products or brands for production.
4. use certain technology including hardware, software and maintenance.
5. spend certain amount yearly to update the facility, equipment and others.
6. use a certain accountant, consultant, advertising agency, etc. (Keup, 1990).

### Technology

Technology is defined in Electric Library Encyclopedia as the application of scientific discoveries to the production of goods and services to improve the human environment (<http://www.encyclopedia.com/articles/12686.html>). It includes the development of new materials, machinery, and processes that improve production and solve technical problems. Since World War II, technology has been increasingly applied

at the microscopic level. Recent advances include the development of computers, the invention of the laser and new synthetic substances, improvement in medical research, and space travel and exploration. Shore (1989) defined computerizing as:

a carefully planned process that results in an easy-to-use, properly sized system that automates selected business operations and so improves the profitability of a business. Computerizing is not, never has been, and never will be a shopping spree at your local computer store. (p. 13)

Stern and Stern (1993) reported that computers and information technology changed the world more than any machine invented during the entire two hundred years of the Industrial Revolution, including the automobile.

#### Use of Technology in the Lodging Industry

Technology is one of the fastest-changing aspects of the hospitality industry (Kasavana, 1997). The rapid changes in corporate and ownership structures within the hospitality industry have had the side effect of forcing lodging companies to employ technology in new and more productive ways (Berchiolli, 1998). The major factors driving technological implementations in hospitality operations are increased transaction volumes through consolidations, complex reporting requirement, and international communication needs. Advances in the areas of guest services, reservations, food and beverage management, sales, food service catering, maintenance, security and hospitality accounting have required the utilization of computer systems technology in every aspect of lodging operations. Researchers who have studied technology in the hospitality industry agreed that technology made a significant change to the way the people work,

interact, manage, and do business (Kasavana, 1991; Chervenak, 1993; Cline, 1996; Wolf, 1997).

According to a study conducted by Andersen Hospitality Consulting, the lodging industry's primary focus would shift to customers from physical assets (Cline, 1997). Technology would play an important role in helping lodging industry reach and maintain customer focus.

#### Hotel Property Management Systems:

Kasavana (1997) defined hotel property management systems (PMS) as the set of computer programs that directly relate the front office and back office activities. A hotel property management system may consist of software programs including reservations, room management, and customer accounting functions. They are usually integrated with each other. Other stand-alone applications may also be interfaced with a hotel property management system such as microcomputers, point of sale systems, central and global reservation systems, internet, call accounting systems, electronic locking systems, energy management systems, auxiliary guest service devices, and guest operated devices, revenue management system (Kasavana, 1997).

#### Reservations Applications

Reservation applications enable a lodging property to process room requests and generate timely and accurate rooms, revenue, and forecasting reports. The local reservation application may have interface with central and global reservations systems

so that the reservations may be kept locally. A central reservation system is an external network of chain hotel's reservation system in which all participating properties are contractually related. A global reservation system is a combination of joint ventures linking a number of diverse businesses through private networks or the Internet. After 1990, traditional central reservations systems that had a stand-alone, single purpose units, started to be replaced with the current systems that were networked within the chain and used as the central depository and booking engines (Burns, 1997).

#### Rooms Management Applications

Rooms management applications keep track of the information regarding the status of rooms, assist in the assignment of rooms during registration, and help coordinate many guest services. These systems may have an interface with the PBX system and allows housekeeping to directly communicate with the front desk and eliminate problems which the traditional rack system may cause. With a PBX interface, housekeeping employees dial the rooms management application and enter the room number and the special code which indicates the status of the room, so that the new status of the room appears in the front desk system (Parets, 1997).

#### Customer Accounting Applications

Customer accounting applications enable the accounting personnel to maintain customer accounts electronically. From the time the customers reserve their rooms, the customer accounting system can keep track of the transactions until the customer checks

out. If the property management system has an interface with point of sale system, the customer accounting system files the charges into appropriate folios. When the customer checks out, outstanding account balances are transferred automatically to accounts receivable for collection (Kasavana, 1997).

### Hotel Property Management System Interface Applications

Hotel property management system (PMS) interface applications are stand-alone computer applications that may be connected to a PMS computer system. There are a number of applications which may be linked to the PMS and this number continue to growing (Kasavana, 1997).

Transfer Interfaces: Property management systems (PMS) in larger lodging properties contain a lot of information. This information may be used for different purposes such as budgeting and forecasting. The transfer interface converts the PMS data into a suitable format for other software applications to use. This software includes wordprocessor, spreadsheet, desktop publishing, database, and interactive training software.

Point of Sale Systems (POS): A point of sale system is defined by Kasavana (1997) as a network of electronic cash registers capable of capturing data at the location of the sale and transferring through PMS to the system's guest accounting and financial tracking modules. Smaller lodging properties may have an electronic cash register which is a stand alone computer system and transfer the customer's bills manually to the property management system (Hotel Technology Handbook, 1996).

PBX Telephone System: A PBX telephone system keeps track of the local and long distance telephone services and apply a markup for switchboard operations. A PBX telephone system can place and price outgoing calls, and post the charges to the customer's folio immediately with detailed call and cost information (Hotel Technology Handbook, 1996; Kasavana, 1997).

Energy Management Systems (EMS): An energy management system monitors room temperatures in a lodging property. An EMS may have an additional sensory component which is used to detect if there is anyone in the guest room. If the sensor detects there is nobody in the room, it cuts off the electricity and water (Hotel Technology Handbook, 1996).

Electronic Locking Systems (ELS): An electronic locking system is a software application that allows the front desk to control the locking of rooms electronically. ELS can produce multiple keys for the same room and changes the code each time a key is lost, changed, or a customer checks out (Kasavana, 1997). Electronic locking systems enhanced guest security significantly and therefore many franchisors started to require to replace metal key locks with programmable locking systems (Hotel Technology Handbook, 1996).

Guest Service Systems: A guest service system is a combination of applications that provide additional services to customers. Some examples of the guests service systems might be voice mail systems, automatic wake-up call systems, TV based interactive guide, on-demand movie system (Kasavana, 1997). Research suggested that

on demand videos were the most popular hotel room amenity (Hotel Technology Handbook, 1996).

Revenue Management Systems (RMS): A revenue management system is defined as set of forecasting techniques used to determine the room rates based on demand and supply. RMS also can make a decision to accept or reject a booking in order to maximize revenue by using past information and predictability equations.

On-Line Management Systems: On-line management systems include the internet, intranet, and extranet applications (Wolf, 1997). The Internet is a large series of computer networks designed to provide universal access to information and communication services around the world. The Internet is often used in lodging industry as a marketing and sales tool. The big chains made ten percent of their reservations through Internet ([http://www.hotel-online.com/Neo/News/PressReleases1998\\_3rd/Sept98\\_OnlineBookings.html](http://www.hotel-online.com/Neo/News/PressReleases1998_3rd/Sept98_OnlineBookings.html)). An Intranet is a computer network within a company at one geographic location. An extranet is the computer network within one or more corporation at multiple geographic locations. According to Hotel Technology Handbook (1996) the Internet will be a part of the guestroom in the next decade. The customers will be able to surf, chat, play games, email, entertain on the Internet. The study conducted by Hoof and Verbeeten (1998) revealed that about two-thirds of the hotel in the United States had e-mail and World Wide Web (WWW) page. E-mail was intended to be used for external environment. Its use within the property was limited. The primary goal of existing on the WWW in the lodging industry was to give information rather than selling the property in the virtual environment (Hoof & Verbeeten, 1998). The same study

suggested that there was a positive relationship between the size of Internet presence of a lodging property and its size.

### Impact of Technology

Benjamin, Rockart, Morton, and Wyman (1987) suggested that technology advances in the last decade created strategic opportunities that all U.S. industries should take advantage of if they wanted to maintain their competitive edge. Previous research suggested that the most important impact of the use of technology in the lodging industry was that it was a major determinant of guest satisfaction (McHoul, 1994; Hoof et al., 1995; Kasavana, 1997). Other researchers such as Reid and Sandler (1992) also concluded that lodging companies use technology to improve guest satisfaction. David, Grabski and Kasavana (1996) suggested that “hotel companies believed that information technology helped improve the quality of business operations” (p.68). Hoof et. al. (1995) suggested that majority of the lodging managers reported that technology enhanced the effectiveness of their property. However, research on the impact of technology showed that it was impossible to predict with any certainty how a technology application would affect an organization (Shore, 1989). The overall impact of the technology depended on how the technology application was designed, conceived, implemented, and used.

Hoof et. al. (1995) identified five impacts of technology in the lodging industry:

1. Impact on customer satisfaction
2. Impact on efficiency
3. Impact on employee/manager productivity



4. Impact on profitability
5. Impact on costs

Impact on Customer Satisfaction: In the lodging industry, delivering quality service has become challenging because of high turnover rate, increasing labor costs, and shortage of skilled employees. As a result, technology applications have helped the lodging industry to enhance service quality and improve the quality of customer satisfaction (Hoof et. al, 1995). The 1990 American Hotel and Motel Association's survey of the lodging industry revealed the fact that improved customer experience and satisfaction was perceived as the biggest advantage of technology (Hoof et. al, 1995). On the other hand, the 1998 American Customer Satisfaction Index revealed that customers saw satisfaction as one of the most important factors when selecting a lodging property (Whitford, 1998). The author suggested that technology can be a key factor in increasing the customer satisfaction in the lodging properties.

Robbins and Denzo (1998) suggested that technology could increase customer satisfaction in three ways. First, technology applications could personalize service that previously was standardized so that management could customize service for each guest's unique needs. Second, technology could supplement service by providing the customer with additional support related to the use of the product and third, technology could transform the business. Both lodging property managers and customers agreed that technology help increase customer satisfaction (Whitford, 1998; Hoof et. al, 1995).

Impact on Efficiency: Automation and database management software helps managers in several ways. Automating files on groups lets different properties within a chain or

management firm exchange information. Multi-property lodging companies reduce redundant sales calls by automating information business contacts. Loading data on the each property help sales people access inventory and facilities information in a better way (Hotel Technology Handbook, 1996).

Impact of Employee/Manager Productivity: Duncan (1994) suggested that technology was one of the most important factors that enhanced efficiency in lodging properties. Technology helped increase efficiency by delimitating the human errors, speeding up the process of check in/out and service delivery.

One of the principal problems facing managers in the future will be how to ensure service quality with fewer managers. The view offered here is that information technology, despite large reductions in the number of managers, can lead to the creation of new types of organizational structures that will, in turn, lead more effective management while still ensuring service quality. (Durocher & Niman, 1993)

Impact on Costs: Kasavana (1995) suggested that majority of the food and beverage technology applications cost less than the systems they replaced. Desktop publishing may decrease or eliminate the expenses in the lodging industry associated with graphic artwork, typesetting, paste-up, and production. Another example is that in-room controls installed in each lodging property room provided significant energy cost savings as well as increased customer satisfaction by providing a comfortable and stable environment. The payback duration for the energy systems in a lodging property takes maximum of two years (Setwitz, 1998).

Although the cost of technology applications have declined in the last decade, the number of the technology applications used in lodging properties have increased, which has resulted in an increase in overall technology costs.

Impact on Profitability: Technology may provide lodging properties competitive advantages through the control of important and fundamental elements such as multiple operations, marketing intelligence, menu planning, financial analysis, corporate accounting, labor scheduling, production planning, customer service, account settlement, product pricing, and inventory management, which all help increase profitability (Kasavana, 1994).

## CHAPTER III

### METHODOLOGY

A number of studies have been conducted regarding technology applications, but little information is known regarding the factors that impact the utilization of technology in Oklahoma lodging properties. The purpose of this study was to assess the factors that impact the utilization of technology in Oklahoma lodging properties. The information discovered through this study will be used to help to produce a report and training program concerning the utilization of technology applications in lodging operations. In this study, Oklahoma lodging managers were asked to rank their level of agreement with statements concerning the present and future implications of technology. This chapter includes the details concerning research design; the population; data collection; development of the instrumentation; and data analysis.

#### Research Design

Planning and development for the research study began in the spring of 1998 and continued through June 1998. During that time a review of literature was conducted, data collection procedures were determined, a survey instrument (Appendix B) was formulated and pilot tested, and data analysis techniques were selected. The objective of

this study was to report information that will be useful to lodging operators who are confronted by the need to make decisions regarding the use of technology in their properties. The research design employed in this study was a survey in the form of a faxed questionnaire.

### Population

The population used in this study was all lodging managers in Oklahoma (N=266). The Membership Director of the Oklahoma Hotel and Motel Association provided the property names, addresses, telephone and fax numbers, and the names of the general managers for 151 members of the Oklahoma Hotel and Motel Association (OHMA) and 111 non-members.

### Data Collection

#### Planning and Development

The questionnaire was developed through a literature review and evaluation of other questionnaires utilized in previous research regarding technology applications in the hospitality industry. Following development of the questionnaire, the Board of Directors of the Oklahoma Hotel and Motel Association, hospitality educators, and university faculty pre-tested the instrument to check for clarity, content, formatting, and the average length of time to complete the survey. The instrument was modified based on the input received. The instrument and data collection procedures were reviewed and approved by Institutional Review Board (IRB) of Oklahoma State University. (Appendix xxx)

## The Instrument

Dillman (1978) recommends that a cover letter be sent with a questionnaire and contain the study title, a graphic illustration, any needed directions, and the name and address of the study sponsor. The first page of the questionnaire should be designed to transfer the importance of the study to the respondents. It is also recommended that the first questions in the survey instrument be easy, applicable to everyone, and designed to create interest in completing the survey.

The questionnaire used in this study was designed to obtain information from Oklahoma lodging property managers in three areas: lodging managers' perceptions regarding the factors that have an effect on the use of technology applications in lodging properties, the technology applications available in the respondents' property and demographics. The first section of the questionnaire listed 20 different statements about the use of technology and asked respondents to rank their level of agreement with each statement on a Likert scale (one to five). The second section listed fifty technology applications and asked managers if they utilized or did not utilize each technology application listed in their property. If they utilized the technology application, they were asked to identify the reasons: franchise requirement, customer satisfaction, and/or employee productivity. If they did not use the technology application, they were asked to identify the reasons: not needed, too expensive, and/or not familiar with the technology.

The demographic section of the questionnaire dealt with gender, educational background, time period worked in present position, time period worked in the hospitality industry, the type of the property, number of years of the property was in business,

market, segment of the property, location of the property, average room rate, information about reservation sources, ownership of the property, and number of employees.

A cover letter signed by the Chairman of Oklahoma Hotel and Motel Association (OHMA) and the researchers, accompanied the instrument and explained the purpose of the research and provided instructions for completing the questionnaire. The cover letter was printed on OHMA's letterhead. A code was printed on each questionnaire to identify the respondents for tracking purposes only.

### Survey Procedures

Data was collected by using a fax survey. Research suggested that fax methodology has a higher response rate than mail methodology (Dickson & Maclachlan, 1992; 1996; Vazzana, 1994). Similarly, hospitality industry research that utilized fax surveys resulted a relatively better response rate than mail surveys (Beck, 1996; Ferreira, 1998). Faxed materials are often perceived as more important and sensitive by managers. This may also lead to a higher response rate (Elfenbein, 1993).

The instrument was faxed in a four-page format using automated fax merge software. The survey included the instructions at the end for returning the questionnaire by return fax or mail. Two hundred sixty six questionnaires were faxed on July 19, 1998, and respondents were asked to return them by August 10, 1998.

Sixteen percent (n=43) of the survey instruments were received by August 3, 1998. Seven of the respondents did not complete the instrument. A follow-up fax along with another copy of the instrument was sent to each non-respondent (n=223) on August

5, 1998 to encourage participation in the study. Of the non-respondents who received the follow-up fax, seven percent (n=17) returned completed survey. The total response (n=60) for the study was twenty-two percent.

### Data Analysis

The data collected on each instrument was entered into the computer using Microsoft Excel from Microsoft Corporation for statistical analysis (MS Excel, 1997). The data was analyzed using the Statistical Analysis System (SAS) from SAS Institute (1987). Data obtained from the questionnaires was tabulated using frequency tables, means, and percentages. Standard statistical procedures, such as frequency, chi-square, and correlated reliability were used to analyze the data, and the results were reported in Chapter IV.



## CHAPTER IV

### RESULTS AND DISCUSSIONS

The purpose of this study was to assess the factors that impact the utilization of technology currently used by Oklahoma Lodging Properties. Data was obtained using the research instrument and methodology described in Chapter III. This chapter was developed to present the findings of the research. The areas addressed in this chapter include: response rate, instrument reliability, respondent demographics, utilization of technology statement ratings, and utilization of technology applications in respondents' properties.

#### Response Rate

Two hundred sixty six questionnaires were faxed on July 19, 1998. One hundred fifty one were sent to members of Oklahoma Hotel and Motel Association (OHMA) while one hundred fifteen were faxed to non-members. The total response rate was 22 percent (n=60). Six of the questionnaires returned were not usable for statistical analysis. Table I indicates thirty one percent of the respondents were members of the Oklahoma Hotel and Motel Association while eleven percent were non-members.

TABLE I  
RESPONSE RATE BASED ON OHMA MEMBERSHIP

Affiliation	Number of Response	Percentage of Response
Members n=151	47	31
Non-Members n=115	13	11
Total N=266	60	22

#### Instrument Reliability

Cronbach's Alpha, a reliability analysis, was run on the level of agreement with technology statements. Table II shows the results of this analysis.

TABLE II  
RELIABILITY COEFFICIENT FOR LEVEL OF AGREEMENT  
WITH TECHNOLOGY STATEMENTS

Section	Reliability Coefficient
Technology Statements N of cases= 54 N of items=20	.8026

## Respondent and Lodging Property Demographics

The demographic characteristics of the respondents are described for both members and non-members of OHMA in Table III. The majority of the respondents were male, 30 (68.2%) for the members, 8 (80.0%) for the non-members. For educational background, 15 (34.1%) of the member respondents had some college education, compared to 4 (40.4%) for non-members. The most frequent level of education reported by all respondents was a bachelors degree, 18 (40.9%) for members and 3 (33.3%) for non-members. Only one member indicated they had doctorate degree.

There were similarities between members and non-members regarding the time worked in the present position. Most respondents worked in their current position for 3 to 5 years, and majority had worked in the hospitality industry for more than 10 years. The number of respondents who worked for 3 to 5 years in their current position was 10 (23.3%) for members and 3 (30.0%) for non-members. Lodging managers who worked in the hospitality industry for more than 10 years were 29 (65.9%) for members and 5 (50.0%) for non-members. Table IV shows the cross-relation between the time worked in the current position and the time worked in the hospitality industry.

TABLE III  
RESPONDENT DEMOGRAPHICS

Variable	Members		Non-Members		Total	
	Freq.	% of n	Freq.	% of n	Freq.	% of n
<u>Gender</u>						
Male	30	68.2	8	80.0	38	70.4
Female	14	31.8	2	20.0	16	29.6
<u>Education</u>						
High School	1	2.3	0	0	1	1.9
Some College	15	34.1	4	40.4	19	35.2
Associates Degree	4	9.1	1	11.1	5	9.3
Bachelors Degree	18	40.9	3	33.3	21	38.9
Some Graduate	2	4.5	1	11.1	3	5.6
Masters Degree	3	6.8	0	0	3	5.6
Doctorate Degree	1	2.3	0	0	1	1.9
Other	0	0	0	0	0	0
Did not respond	0	0	1	11.1	1	1.9
<u>Time Working in Present Position</u>						
Less than 1 year	6	14.0	5	50.0	11	20.4
1-2 years	5	11.6	2	20.0	7	13.0
3-5 years	10	23.3	3	30.0	13	24.1
6-10 years	11	25.6	0	0	11	20.4
More than 10 years	11	25.6	0	0	11	20.4
Did not respond	1	1.9	0	0	1	1.9
<u>Time Worked in Hospitality Industry</u>						
Less than 1 year	0	0	1	10.0	1	1.9
1-2 years	0	0	1	10.0	1	1.9
3-5 years	2	4.5	1	10.0	3	5.6
6-10 years	13	29.5	2	20.0	15	27.8
More than 10 years	29	65.9	5	50.0	34	63.0
Did not respond	0	0	0	0	0	0

TABLE III (cont.)

## RESPONDENT DEMOGRAPHICS

Variable	Members		Non-Members		Total	
	Freq.	% of n	Freq.	% of n	Freq.	% of n
<u>Position</u>						
General Manager	36	81.8	9	90.0	45	83.3
Assistant Gen. Mng.	1	2.3	1	10.0	2	3.7
Front Office Manager	1	2.3	0	0	1	1.9
Owner	5	11.4	0	0	5	9.3
Other	1	2.3	0	0	1	1.9

The majority of the lodging managers change workplace or position within 3 to 5 years. There are 6 (54.5%) lodging managers who have worked in the hospitality industry for 6 to 10 years but been working in their current position for less than a year.

The majority of the respondents indicated they were a general manager, 36 (81.8%) among members, and 9 (90.0%) for non-members. There were 5 (11.4%) members who owned the lodging property and 1 (10.0%) non-member owner.

TABLE IV  
CROSSTABULATION BETWEEN TIME WORKED IN THE HOSPITALITY  
INDUSTRY AND THE TIME WORKED IN THE SAME POSITION

		Time worked in the same position						
		Less than 1 year	1-2 years	3-5 Years	6-10 years	More than 10 years	Total	
Time worked in the hospitality industry	Less than 1 year	Count	1				1	
		%	9.1%				1.9%	
	1-2 years	Count	1				1	
		%	9.1%				1.9%	
	3-5 Years	Count		2	1		3	
		%		28.6%	7.7%		5.7%	
	6-10 years	Count	6	2	3	4	15	
		%	54.5%	28.6%	23.1%	36.4%	28.3%	
	More than 10 years	Count	3	3	9	7	11	33
		%	27.3%	42.9%	69.2%	63.6%	100.0%	62.3%
Total	Count	11	7	13	11	11	53	
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Table V identified the lodging property demographics. Respondents indicated that they worked in different segments of the lodging industry. Among members, the largest segment represented was Mid-Priced lodging property, 27 (61.4%), followed by Upscale, 9 (20.5%). Among non-members, the largest segment was also Mid-Priced, 7 (70.0%), followed by Economy, 2 (20.0%). The location of the property was reported by the respondents as: Suburban, 16 (36.4%) members and 3 (30.0%) non-members; Airport location, 4 (9.1%) members and 1 (10.0%) non-members; highway, 14 (31.8%) members

and 6 (60.0%) non-members; resort, 5 (11.4%) members and no non-members; downtown; 5 (11.4) members and no non-members.

The majority of the respondents identified their property as a motel, 16 (37.2%) for members and 7 (70.0%) for non-members. The other property types reported were: 14 (32.6%) members and 2 (20.0%) non-members indicated that they were a standard hotel, 3 (7.0%) members and 1 (10.0%) non-member indicated that they were convention hotels, 3 (7.0%) members and no non-members indicated that they were conference centers, 2 (4.7%) members and no non-members reported that they were all suite, and 4 (9.3%) members and no non-members indicated other property type.

TABLE V  
LODGING PROPERTY DEMOGRAPHICS

Variable	Members		Non-Members		Total	
	Freq.	% of n	Freq.	% of n	Freq.	% of n
<u>Segment</u>						
Luxury	0	0	1	10.0	1	1.9
Upscale	9	20.5	0	0	9	16.7
Mid-Priced	27	61.4	7	70.0	34	63
Budget	5	11.4	0	0	5	9.3
Economy	1	2.3	2	20.0	3	5.6
Other	2	4.5	0	0	2	3.7

TABLE V (cont.)  
LODGING PROPERTY DEMOGRAPHICS

Variable	Members		Non-Members		Total	
	Freq.	% of n	Freq.	% of n	Freq.	% of n
<u>Location</u>						
Downtown	5	11.4	0	0	5	9.3
Suburban	16	36.4	3	30.0	19	35.2
Airport	4	9.1	1	10.0	5	9.3
Highway	14	31.8	6	60.0	20	37.0
Resort	5	11.4	0	0	5	9.3
<u>Property Type</u>						
Convention Hotel	3	7.0	1	10.0	4	7.5
Standard Hotel	14	32.6	2	20.0	16	30.2
Motel	16	37.2	7	70.0	23	43.4
All Suite	2	4.7	0	0	2	3.8
Bed & Breakfast	1	2.3	0	0	1	1.9
Conference Center	3	7.0	0	0	3	5.7
Other	4	9.3	0	0	4	7.5
<u>Average Room Rate</u>						
Under \$30	0	0	1	10.0	1	1.9
\$30-\$44.99	11	25.0	3	30.0	14	25.9
\$45-\$59.99	14	31.8	6	60.0	20	37.0
\$60-\$84.99	11	25.0	0	0	11	20.4
\$85-\$99.99	6	13.6	0	0	6	11.1
\$100 or more	1	2.3	0	0	1	1.9
Did not respond	1	2.3	0	0	1	1.9
<u>Ownership</u>						
Corporate	14	31.8	4	40.0	18	33.3
Chain	1	2.3	0	0	1	1.9
Franchisee	14	31.8	3	30.0	17	31.5
Independent	12	27.3	3	30.0	15	27.8
Other	3	6.8	0	0	3	5.6



TABLE V (continued)  
LODGING PROPERTY DEMOGRAPHICS

Variable	Members		Non-Members		Total	
	Freq.	% of n	Freq.	% of n	Freq.	% of n
<u>Food and Beverage</u>						
<u>Unit</u>						
Yes	33	75.0	7	70.0	40	74.0
No	10	22.0	3	30.0	13	25.0
Did not respond	1	3.0	0	0	1	1.9

The average room rate was reported as follows: 14 (31.8%) members and 6 (60.0%) non-members reported an average room rate of between \$45 and \$59.99, 11 (25.0%) members and 3 (30.0%) of non-members reported between \$30 and \$44.99, 11 (25.0%) members and no non-members reported an average room rate between \$60 and \$84.99, 6 (13.6%) members and no non-members reported an average room rate between \$85 and \$99.99, 1 (2.3%) member and no non-members reported an average room rate of \$100 or more, 1 (10.0%) non-member and no members reported an average room rate under \$30. One (2.3%) member respondent did not answer this question.

The majority of the respondents, 14 (31.8%) members and 4 (40.0%) non-members indicated corporations owned their properties. There was a food and beverage unit in 33 (75.0%) of the member properties while there were food and beverage units in 7 (70.0%) of non-member properties.

TABLE VI  
OTHER LODGING PROPERTY DEMOGRAPHICS

Variable	Members			Non-Members			Total		
	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>
Amount managers willing to spend for technology	44	240.7	781.2	10	170.0	205.7	54	227.6	709.3
Room Number	42	160.3	152.5	10	95.9	32.6	52	147.9	139.8
Property Age	42	17.0	14.2	8	14.0	8.2	50	16.6	13.4
<u>Guest Nights Originate from</u>									
Travel Agents	44	8.5	11.0	10	2.4	4.0	54	7.4	10.3
Walk-in	44	24.5	26.5	10	26.4	24.9	54	24.8	26.0
Direct call	44	33.0	25.9	10	28.6	31.5	54	32.2	26.7
Central Reservation System	44	15.6	17.3	10	11.3	15.4	54	14.8	16.9
Internet Reservation	44	0.7	1.3	10	0.5	1.5	54	1.0	1.3
Other	44	7.2	14.5	10	0.4	1.2	54	5.9	13.3
<u>Sales composed of</u>									
Business	44	41.6	27.2	10	39.6	31.0	54	41.2	27.6
Leisure	44	25.3	22.8	10	24.5	26.8	54	25.2	23.3
Conventions	44	12.7	23.7	10	4.5	4.6	54	11.2	21.7
Government	44	7.8	15.8	10	8.2	13.0	54	7.9	15.2
Other	44	2.1	5.10	10	3.2	4.1	54	2.3	4.9
<u>Number of employees</u>									
Full Time	41	54.6	77.1	10	25.3	22.5	51	48.8	70.67
Part-Time	41	11.8	14.0	8	8.3	8.3	33	12.6	15.1

Table VI shows the means and standard deviations for technology expenditures, number of rooms per property, property age, guest night origination, sales, and number of

employees. The average amount lodging managers indicated that they were willing to spend for technology per room per year was \$ 240.7 for members and \$170.0 for non-members. Lodging properties managed by OHMA members, averaged 160.3 rooms while non-member properties averaged 95.9 rooms. The average property age was 17 years for member respondents and 14 years for non-member respondents.

Most respondents reported the source for their reservations to be direct call, 33.0% for members and 28.6% for non-members. Walk-in reservations followed direct call with 24.5% for members and 26.4% for non-members reported. Reservations received over the Internet was the least utilized method, 0.7% for members and 0.5% for non-members. Sales in Oklahoma Lodging properties were composed of mostly business sales, 41.6% for members and 39.6% for non-members. This was followed by leisure sales, 25.3% for members and 24.5% for non-members. On average, members had 54.6 full-time and 11.8 part-time employees while non-members reported 25.3 full-time, 8.3 part-time employees.

Table VII shows the distribution of the membership status among the respondents. Oklahoma Hotel and Motel Association membership was reported the most, 44 (81.4%). This was followed by the American Hotel and Motel Association membership 30 (55.6%) members, National Restaurant Association membership 4 (7.4%), Oklahoma Restaurant Association membership 9 (16.7%), Oklahoma Travel Industry Association membership 9 (16.7%), and 10 respondents reported they were not member of any professional association.

TABLE VII  
MEMBERSHIP DISTRIBUTION AMONG THE RESPONDENTS

Membership	<u>Frequency</u>	<u>% of n</u>
AHMA	30	55.6
NRA	4	7.4
OHMA	44	81.4
ORA	9	16.7
OTIA	9	16.7
None	10	18.5
N=54		

#### Technology Statements

Table VIII shows the means of the sum of the technology statements. Responses with only a slight difference in means between members and non-members indicated that the respondents included a perception that the internet was a powerful marketing tool, and that having an online presence was critical to the future of the lodging industry.

Lodging managers indicated that technology did not necessarily reduce labor nor that technology could fill the employee vacancies as demonstrated by the statements three, seven, fourteen, and fifteen. Members and non-members indicated a slight difference in means for statements eleven and seventeen. This indicated that respondents thought technology improved guest satisfaction and increased employee and manager productivity. Chi-square analysis was conducted to examine the differences in means of the technology statements between members and non-members. Based on the limited number of responses per group, many cells did not contain enough data for the analysis to be reliable, thus results were not reported.



## Technology Applications

The second section of the questionnaire listed fifty technology applications and asked managers whether they did or did not utilize each of the technology applications listed in their properties. Tables nine through fourteen report the data received from the respondents according to franchise requirement, customer satisfaction, employee productivity, not needed, too expensive, and/or not familiar with the technology. See Appendix B for the detailed list of the technologies and a summary of implementation status.

TABLE IX  
THE TECHNOLOGY USED IN OKLAHOMA LODGING PROPERTIES BASED ON  
FRANCHISE REQUIREMENT

Technology Applications	<u>N</u>	<u>Freq.</u>	<u>%</u>
Global Reservation System	34	29	85.29
Television	36	24	66.67
Property Management System	40	23	57.50
Central Reservation System	23	20	86.96
Guest History Software	36	20	55.56
N=54			

Table IX shows that the five most frequently used technology applications in Oklahoma lodging properties were due to a franchise requirement and included global reservation system 29 (85.29%), television 24 (66.67%), property management system 23 (57.50%), central reservation system 20 (86.96%), and guest history software 20 (55.56%).

TABLE X  
THE TECHNOLOGY USED IN OKLAHOMA LODGING PROPERTIES TO  
ENHANCE CUSTOMER SATISFACTION

Technology Applications	<u>N</u>	<u>Freq.</u>	<u>%</u>
Public Fax	53	43	81.13
Preventive Maintenance	44	33	75.00
Television	36	28	77.78
Automatic Wake-up	36	28	77.78
Remote-in Wireless Control	35	21	60.00
N=54			

Table X shows the five most frequently used technology applications as reported by the respondents to increase customer satisfaction as public fax 43 (81.13%), preventive maintenance 33 (75.0%), television 28 (77.78%), automatic wake-up 28 (77.78%), remote-in wireless control 21 (60.00%).

TABLE XI  
THE TECHNOLOGY BEING USED IN OKLAHOMA LODGING PROPERTIES TO  
ENHANCE EMPLOYEE PRODUCTIVITY

Technology Applications	<u>n</u>	<u>Freq.</u>	<u>%</u>
Word Processing	46	38	82.61
Spreadsheet	41	34	82.93
Property Management System	40	24	60.00
E-Mail	38	24	63.16
PBX Interface	36	21	58.33
N=54			

Table IX shows that the five most frequently used technology applications in Oklahoma lodging properties to increase employee productivity and included word processing 38 (82.61%), spreadsheet 34 (82.93%), property management system 24 (60.0%), email 24 (63.16), and PBX Interface 21 (58.33%).

TABLE XII  
THE TECHNOLOGY NOT USED IN OKLAHOMA LODGING PROPERTIES DUE  
TO BEING TOO EXPENSIVE

Technology Applications	N	Freq.	%
Email Access in guest rooms	47	15	31.91
Personal Computers for guests	30	13	43.33
Handicapped Alarm	30	11	36.67
Room Energy Sensor	30	11	36.67
Exterior Electronic Locks	18	9	50.00
N=54			

Table XIII shows the five most unused technology applications based on expense, email access in guest rooms 15 (31.91%), personal computers for guests 13 (43.33%), handicapped alarm 11 (36.67%), room energy sensor 11 (36.67%), and exterior electronic locks 9 (50.00%).

TABLE XIII  
THE TECHNOLOGY NOT USED IN OKLAHOMA LODGING PROPERTIES BY  
“NOT NEEDED”

Technology Applications	N	Freq.	%
Automatic Transaction Machine	48	24	50.00
Video Cassette Recorder	30	21	70.00
On-demand Movies	31	18	58.06
Desktop Pub.	35	18	51.43
Handicapped Alarm	30	17	56.67
N=54			

Respondents reported the five least frequently used technology applications due to lack of need at the property as automatic transaction machine 24 (50.0%), video cassette recorder



21 (70.0%), on-demand movies 18 (58.06%), desktop publications 18 (51.43%), and handicapped alarm 17 (56.67%).

TABLE XIV  
THE TECHNOLOGY NOT BEING USED BY OKLAHOMA LODGING  
PROPERTIES BY "NOT FAMILIAR WITH THE TECHNOLOGY"

Technology Applications	N	Freq.	%
Extranet	51	30	58.82
Intranet	39	21	53.85
Revenue Optimization System	30	16	53.33
Purchasing Interface with POS	48	15	31.25
Guestroom Security Panels	44	14	31.82
N=54			

Table XIV shows the five most unused technology applications due to lack of knowledge, extranet 30 (58.82%), intranet 21 (53.85%), revenue optimization system 16 (53.33), purchasing interface with POS 15 (31.25%), and guestroom security panels 14 (31.82).

#### Technology Scores

The technology score is the average number of the technologies utilized in respondents properties. Table XV lists the technology scores based on membership, size of property, type of the property, and segment of the property. See Appendix B for a complete list of the technology applications and their implementation as reported by the respondents.

TABLE XV  
TECHNOLOGY SCORES IN OKLAHOMA LODGING PROPERTIES

N	Mean	Std. Dev	Min	Max
<u>Membership</u>				
Member	28.50	7.49	16	45
Non-Member	24.70	5.39	17	32
<u>Rooms / Property</u>				
0-50 Rooms	24.33	10.03	16	42
51-100 Rooms	25.61	5.66	16	37
101 and above	29.80	7.10	17	45
<u>Type of Property</u>				
Motel	25.82	5.94	16	37
Standard	28.25	6.98	19	45
Conference Center	30.57	9.12	17	42
Others	27.00	6.12	13	39
<u>Segment of Property</u>				
	34.22	6.01	25	45
Upscale	27.26	6.51	17	42
Mid-Priced	24.18	7.60	16	38
Budget	24.01	6.85	16	39
Other				

Members reported that they utilized more technology on average than non-members, 28.50 applications for members versus 24.70 for non-members. The technology score based on rooms per property number was reported as follows: properties with zero to fifty rooms utilized an average of 24.33 technology applications, properties with fifty one to one hundred rooms utilized 25.61 technology applications, and properties with one hundred one or more rooms utilized 29.80 technology applications. Respondents

indicated that as the room numbers per property increased, the number of technology applications utilized in the lodging property increased.

Based on property type, motels utilized an average of 25.82 technology applications, standard hotels utilized 28.25 technology applications, conference centers utilized 30.57 technology applications, and the other property types utilized 27.00 technology applications. Respondents reported that upscale hotels utilized 34.22 technology applications, mid-priced properties utilized 27.26 technology applications, budget properties utilized 24.18 technology applications, and other market segment properties utilized 24.01 technology applications. This indicated that as the segment of the property went from budget to upscale, the number of technology applications utilized in the lodging property increased.

## CHAPTER V

### SUMMARY, CONCLUSIONS, RECOMMENDATIONS

The purpose of this study was to assess the factors that impact the utilization of technology in Oklahoma lodging properties. The objective was to report information that would be useful to lodging operators who are confronted by the need to make decisions regarding the use of technology in their properties. This chapter was developed to present the summary, conclusions, and recommendations of the research in order to provide the appropriate insights for the study.

There were four research questions for this study. The research questions were:

1. What technology applications are used in Oklahoma lodging properties?
2. Do technology applications have an effect on customer satisfaction in Oklahoma lodging properties?
3. Do technology applications have an effect on employee productivity in Oklahoma lodging properties?
4. What are other factors that impact the utilization of technology in Oklahoma lodging properties?

The subjects of the study were lodging property managers in Oklahoma. A census of the population (N=266) was conducted in this study. The questionnaire was developed through a literature review and evaluation of other questionnaires utilized in similar previous research regarding technology applications in the hospitality industry. The literature review was comprised of sixteen major sections: History of Lodging Industry, Expected Growth, Customer Satisfaction, Employee Productivity, Franchising, Technology, Use of Technology in the Lodging Industry, Impact of Technology, and a Summary. Fifty four (54) questionnaires were returned in a usable condition for a response rate of twenty two (22) percent.

The questionnaire was divided into three major sections: lodging managers perceptions regarding the factors that have an affection on the use of technology applications in lodging properties, technology applications available in the respondents property, and demographics. The first section of the questionnaire listed 20 different statements about the use of technology and asked respondents to rank their level of agreement with each statement on a Likert scale (one to five). The second section listed fifty technology applications and asked managers if they did or did not utilize each technology application listed in their properties. If they utilized the technology application, they were asked to identify the reasons: franchise requirement, customer satisfaction, and/or employee productivity. If they did not use the technology application, they were asked to identify the reasons: not needed, too expensive, and/or not familiar with the technology. The demographics section of the questionnaire dealt with gender, educational background, time period worked in present position, time period worked in the hospitality industry, the type of the property, number of years of the property was in

business, segment of the property, location of the property, average room rate, information about reservation sources, ownership of the property, and number of employees.

### Summary of the Findings

Based upon the information gained as a result of the study, including the demographics, the following findings were identified:

1. Technology increases customer satisfaction.
2. Technology enhances employee/manager productivity
3. Technology does not decrease either the number of employees needed for operations, or employee training needs.
4. The Internet is important for lodging properties and should be utilized in every function of management.
5. The ten most frequent technologies utilized in Oklahoma lodging properties are automatic wake up systems, word processing software, central reservation systems, guest history software, spreadsheet software, property management systems, electronic mail, database software, global reservation system, and exterior electronic locks.
6. The ten least frequent technologies utilized in Oklahoma lodging properties are in-room fax machines, smart card, personal computer for guests, electronic in-room safes, hand held device for Point of Sale System (POS), extranet, remote check-in/out, purchasing interface with POS, room energy sensor, and automatic transaction machine.
7. Members of Oklahoma Hotel and Motel Association utilized more technology applications in their properties than non-members.

8. As the number of rooms in a property increased, the number of technology applications utilized in that property increased.

9. Conference centers utilize more technology applications than standard hotels that utilize more technology than all-suite, motel and other type of properties.

10. As the segment of the property changed from budget to mid-scale and upscale, the number of technology applications utilized in that property increased.

11. More than half of the Oklahoma lodging properties have an email account and access to the Internet.

12. Oklahoma lodging managers are willing to spend on average \$ 227 per room, per year.

13. Oklahoma lodging managers think that they need to spend some amount of money each year on technology and applications.

## Conclusions

Based on the findings of the study the following conclusions were drawn:

1. Even though lodging property managers think that technology increases customer satisfaction, only two of the technology applications that were most frequently reported were used to enhance customer satisfaction.

2. Lodging managers think that technology increases employee productivity and six of the technology applications that were most frequently reported were used to

increase employee productivity. But technology increases operations costs and technology applications do not decrease training costs.

3. Lodging managers think that the Internet is very important for lodging properties but only one percent of the reservations comes from Internet sources.

4. Hospitality program students and lodging managers should be taught the current software utilized in the lodging industry.

5. It is apparent that lodging managers are not very clear with what technology applications are currently available to lodging industry and how they can benefit from those technology applications.

6. Oklahoma lodging managers agree the future trend as identified by the World Future Society's members in their last conference (Geewax, 1988), specifically that the success in the future will be with those who invest in technology on a regular basis. However the question remains how the lodging managers will use the technology after they invest in it.

## Recommendations

Based on the findings and conclusions of this research the following recommendations are suggested:

1. Develop training programs for Oklahoma lodging managers on how to use and benefit from technology applications. The goal of these training programs would be to improve understanding about technology in generic and specific applications so that the managers could maximize their benefits.



2. Help Oklahoma Hotel and Motel Association with marketing and other materials that will benefit its members.
3. Replicate this study on a national basis that will include a larger sample size and types of lodging properties.
4. This study examined the perceived effectiveness of the technology in Oklahoma lodging properties. The actual effect of the technology on customer satisfaction and employee productivity should be researched in following studies.
5. Another concept to consider is further study into why lodging property managers indicate they need to continue to invest in new technology to stay current but may not understand how to use or benefit of this new technology.

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APPENDIXES



APPENDIX A

DEFINITIONS OF THE TECHNOLOGY APPLICATIONS

<b>Technology</b>	<b>Definition</b>
Word Processing	Software that is used to create text.
Spreadsheet	Software that simulates a paper spreadsheet, or worksheet, in which columns of numbers are summed for budgets and plans. It appears on screen as a matrix of rows and columns, the intersections of which are identified as cells. Spreadsheets can have thousands of cells and can be scrolled horizontally and vertically in order to view them.
Database	A set of related files that is created and managed by a database management system, which may include text, images, sound and video.
Presentation	Software that provides the ability to create output for overheads, handouts, speaker notes and film recorders by using text, graphics, sound, and video.
Desktop Publishing	Software that produces high-quality printed output or camera-ready output for commercial printing
Electronic Mail (E-mail)	The transmission of memos and messages over a network of computers
Internet	A large network made up of a number of smaller networks
Intranet	An in-house Web site that serves the employees of the enterprise and not accessible by the general public
Extranet	A Web site for companies in different locations which provides access to paid research, current inventories and internal databases, virtually any information that is private and not published for everyone
Yield Management Software	A Software that provides forecasting to determine the room rates based on demand and supply. It also can make a decision to accept or reject a booking in order to maximize revenue by using past information and predictability equations.
PBX Interface	An in-house telephone switching system that interconnects telephone extensions to each other, as well as to the outside telephone network. It may include functions such as least cost routing for outside calls, call forwarding, conference calling and call accounting
Revenue Optimization System	A software that inputs the historic information and computes some revenue opportunity suggestions for the future
Property Management System	the set of computer programs that directly relate the front office and back office activities
Point of Sale System (POS)	as a network of electronic cash registers capable of capturing data at the location of the sale and transferring through PMS to the system's guest accounting and financial tracking modules
Hand Held Device for POS	A small wireless computer which transfer orders taken to the POS system

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Purchasing Interface with POS	The interconnection between POS and purchasing software.
PMS interface with POS	The interconnection between PMS and POS
Accounting interface with PMS	The interconnection between PMS and Accounting software
Sales Interface with PMS	The interconnection between PMS and sales software
Guest History Software	A software which keeps customer information in a database and capable of running queries when needed.
Employee Paging	A communications service that is evolving from a one-way beeper service to a one-way text service, and eventually, to a two-way text and voice service
Interactive Training software	A training software which provides back-and-forth dialog between the user and a computer
Television (Cable/ Satellite)	A device which transfers picture and sound
Video Cassette Recorder	A device which plays and record on video cassette
E-mail access in guest rooms	Electronic mail availability in hotel rooms
Electronic in-room safes	A safe which is located in guest rooms and is protected electronically and accessible with a special code
Personal Computer for guests	Personal computer availability in hotel rooms
Pay per view	TV-based Video selection system
Interactive Guide (TV based)	A software which provides information about the area, shopping information, maps, and check-in/out and related services on back-and-forth dialog between the user and a computer environment
Video Voice Mail	Voice mail which includes sound and picture
On-demand Movies	A system which gives user to choose a movie and charges accordingly to the user account
Folio review/ in room checkout	A interconnected system between the TV and PMS which enables the hotel guests view their account information
In room fax machines	Fax device located in guest rooms
Public Fax	Fax device accessible by public
Remote check-in/out station	A interconnected check-in/out station between PMS and the device located in lobby which enables guests self check-in/out
Central Reservation System	A central reservation system which is an external network of chain hotel's reservation system in which all participating properties are contractually related
Global Reservation System	A global reservation system which is a combination of joint ventures linking a number of diverse businesses through private networks or the Internet
Automatic wake-up	A software which is connected with PBX system and enables guests set wake-up call time and calls them accordingly
Smart Card	A credit card with a built-in microprocessor and memory used for identification or financial transactions

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Automatic Transaction Machine	Bank independent or dependent automatic device that money can be withdrawn, deposited and related transaction can be made
Exterior electronic locks	Electronically controlled exterior locks (magnetically)
Handicapped Alarm	An alarm system which uses sound and light
Silent Alarm System	Alarm system designed for deaf people.
Electronic Locking System	Electronically controlled interior locks (magnetically)
Room Energy Sensor	Room energy management sensor detects if there is anyone in the guest room and if not, cuts the supply for electricity to help save energy
Preventive Maintenance	A software which provides deadlines and reminders about when and how to make maintenance in order to prevent defects
Remote-in room wireless Control	A combination of hardware and software which are used to control room temperature, electricity, and water wirelessly
Smoke, Fire & Heat Detectors	Smoke, fire and heat detectors
Guestroom Security Panels	A software which enables operator to control room environment in case of a fire

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APPENDIX B

TECHNOLOGY APPLICATIONS UTILIZED IN OKLAHOMA LODGING  
PROPERTIES

APPENDIX B

TECHNOLOGY APPLICATIONS UTILIZED IN OKLAHOMA LODGING PROPERTIES

Technology	YES		Franchise Requirement		Customer Satisfaction		Employee Productivity		NO		Too Expensive		Not Needed		Not Familiar with the tech.	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Television	54	100	24	66.67	28	77.78	7	19.44	0	0	0	0.00	0	0.00	0	0.00
Public Fax	53	98.1	18	33.96	43	81.13	16	30.19	1	1.9	0	0.00	0	0.00	0	0.00
Smoke Fire Heat Detectors	51	94.1	17	73.91	14	60.87	8	34.78	3	5.6	0	0.0	3	100.0	0	0.0
Automatic Wake-up	50	92.6	19	52.78	28	77.78	11	30.56	4	7.4	2	11.11	14	77.78	6	33.33
Central Reservation System	46	85.2	20	86.96	12	52.17	11	47.83	8	14.8	4	25.33	8	100.0	1	5.63
Word Processing	46	85.2	7	15.22	13	28.26	38	82.61	8	14.8	0	0.00	2	25.00	2	25.00
Preventive Maintenance	44	83.0	18	40.91	33	75.00	20	45.45	9	17.0	2	22.22	2	22.22	5	55.56
Guest History Software	43	81.1	20	55.56	19	52.78	20	55.56	10	18.9	4	23.53	3	17.65	7	41.18
Spreadsheet	41	77.4	6	14.63	8	19.51	34	82.93	12	22.6	0	0.00	7	58.33	1	8.33
Remote-in Wireless Control	39	76.5	10	28.57	21	60.00	10	28.57	12	23.5	4	25.00	13	81.25	1	6.25
Property Management System	40	74.1	23	57.50	20	50.00	24	60.00	14	25.9	3	21.43	5	35.71	2	14.29
E-Mail	38	70.4	7	18.42	12	31.58	24	63.16	16	29.6	6	37.50	3	18.75	3	18.75
Video Cassette Recorder	38	70.4	6	26.09	20	86.96	4	17.39	16	29.6	4	13.33	21	70.00	5	16.67
Database	36	67.9	17	47.22	11	30.56	19	52.78	17	32.1	0	0.00	6	35.29	8	47.06
PBX Interface	36	66.7	11	30.56	19	52.78	21	58.33	18	33.3	0	0.00	9	50.00	5	27.78
Exterior Electronic Locks	34	63.0	15	41.67	21	58.33	8	22.22	20	37.0	9	50.00	9	50.00	3	16.67
Global Reservation System	34	63.0	29	85.29	17	50.00	10	29.41	20	37.0	3	15.00	7	35.00	4	20.00
Handicapped Alarm	33	61.1	11	47.83	9	39.13	5	21.74	21	38.9	11	36.67	17	56.67	4	13.33
Employee Paging	32	59.3	4	17.39	12	52.17	18	78.26	22	40.7	1	3.33	17	56.67	13	43.33
Electronic Locking System	31	57.4	17	47.22	14	38.89	11	30.56	23	42.6	5	27.78	11	61.11	4	22.22
Internet Access	29	53.7	9	31.03	8	27.59	17	58.62	25	46.3	5	20.00	8	32.00	7	28.00

APPENDIX B (cont.)

TECHNOLOGY APPLICATIONS UTILIZED IN OKLAHOMA LODGING PROPERTIES

Technology	YES		Franchise Requirement		Customer Satisfaction		Employee Productivity		NO		Too Expensive		Not Needed		Not Familiar with the tech.	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Email Access in guest rooms	6	11.3	3	50.00	3	50.00	0	0.00	47	88.7	15	31.91	14	29.79	5	10.64
Room Energy Sensor	6	11.1	5	21.74	9	39.13	5	21.74	48	88.9	11	36.67	4	13.33	7	23.33
Automatic Transaction Machine	6	11.1	4	66.67	3	50.00	2	33.33	48	88.9	6	12.50	24	50.00	8	16.67
Video Voice Mail	5	9.4	7	30.43	11	47.83	6	26.09	48	90.6	8	27.59	12	41.38	5	17.24
Purchasing Interface with POS	5	9.4	2	40.00	1	20.00	2	40.00	48	90.6	7	14.58	17	35.42	15	31.25
Remote check In/out Station	5	9.3	8	22.22	18	50.00	3	8.33	49	90.7	2	11.11	9	50.00	4	22.22
Personal Computers for guests	3	5.6	10	43.48	8	34.78	2	8.70	51	94.4	13	43.33	12	40.00	2	6.67
Electronic in-room safes	3	5.6	12	33.33	18	50.00	2	5.56	51	94.4	5	27.78	8	44.44	2	11.11
Extranet	3	5.6	1	33.33	0	0.00	1	33.33	51	94.4	4	7.84	11	21.57	30	58.82
Hand Held Device System for POS	3	5.6	1	4.35	13	56.52	6	26.09	51	94.4	3	10.00	13	43.33	10	33.33
Smart Card	2	3.8	2	8.70	9	39.13	8	34.78	50	96.2	0	0.00	4	14.29	13	46.43
In room fax machines	2	3.7	7	30.43	10	43.48	1	4.35	52	96.3	9	30.00	12	40.00	3	10.00

APPENDIX C

COVER LETTER AND THE SURVEY INSTRUMENT





**Oklahoma Hotel & Motel Association**

3800 N. Portland • Oklahoma City, OK 73112-2948

(405) 942-OHMA (6462) • FAX (405) 942-0541

Friday, July 31, 1998

Dear Oklahoma Lodging Executive:

We have an opportunity to participate in a study which will return valuable information to our industry. This study is being undertaken by OSU graduate student Cihan Cobanoglu as he pursues his Masters Degree in Hotel and Restaurant Administration. The OH&MA Board of Directors and the OSU School of Hotel and Restaurant Administration encourage you to reply.

The project entitled, ***"An Assessment of Technology Applications in Lodging Properties in Oklahoma"***. Information discovered through this study will be compiled in a report, as well as used to develop a training program concerning the application of technology in our lodging operations. Dr. Bill Ryan, interim director and assistant professor at the OSU School of Hotel and Restaurant Administration will be working with Cihan on this project.

We would appreciate your investment of 12 to 15 minutes of time to complete the enclosed survey. As a participant, you will be eligible to receive a copy of the results of this study.

**Your input is extremely important to the outcome of the study.** Your response will be held in confidence. This form has an identification number on it for tracking purposes only.

If you have any questions or need further assistance, please call us at (405) 744 6713, or contact Gay Clarkson, Institutional Review Board Secretary, 304 Whitehurst, Oklahoma State University, Stillwater, OK 74078; (405) 744 5700.

Please take a few minutes to complete this survey and fax it to **405- 744 6299 by Monday, August 10, 1998.** We look forward to receiving your response.

Sincerely,  
Signature  
Joe Martin  
Chairman  
Oklahoma Hotel  
& Motel Association

Signature  
Cihan Cobanoglu  
Graduate Research Assistant  
OSU-HRAD

Signature  
Bill Ryan, Ph.D.  
Interim Director &  
Assistant Professor  
OSU-HRAD

## AN ASSESSMENT OF TECHNOLOGY APPLICATIONS IN OKLAHOMA LODGING PROPERTIES

This survey will take approximately 15 minutes to complete. It consists of 3 sections. Section I lists a number of statements about technology and asks you to rank your level of agreement with each. Section II asks about the technology applications in your property. Section III asks demographic questions. «Code»

### Section I:

Circle the level of agreement from 1 to 5 for each statement. Use the following scale to answer questions 1 to 20.

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither Agree Nor Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
	1	2	3	4	5
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

**Section II: Technology Applications in your property**

Please indicate whether the technology applications listed below are utilized in your property.

If **YES**, please mark if the application is a franchise requirement and whether it impacts customer satisfaction and/or employee productivity in your property. Mark all that apply.

If **NO**, please indicate whether the application is too expensive, not needed, and/or you are not familiar with it. Mark all that apply. «Code»

		YES	Franchise Requirement	Customer Satisfaction	Employee Productivity	NO	Too Expensive	Not Needed	Not Familiar with the technology
1	Word Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Spreadsheet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Database	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Presentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Desktop Publishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Electronic Mail (E-mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Internet Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Extranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Yield Management Software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	PBX Interface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Revenue Optimization System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Property Management System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Point of Sale System (POS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Hand Held Device for POS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Purchasing Interface with POS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	PMS interface with POS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Accounting interface with PMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Sales Interface with PMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Guest History Software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Employee Paging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Interactive Training software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Television (Cable/ Satellite)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Video Cassette Recorder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	E-mail access in guest rooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Electronic in-room safes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Personal Computer for guests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Pay per view	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Interactive Guide (TV based)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Video Voice Mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	On-demand Movies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Folio review/ in room checkout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	In room fax machines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	Public Fax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Remote check-in/out station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Central Reservation System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	Global Reservation System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Automatic wake-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	Smart Card	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	Automatic Transaction Machine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Exterior electronic locks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42	Handicapped Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43	Silent Alarm System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	Electronic Locking System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45	Room Energy Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46	Preventive Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47	Remote-in room wireless Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48	Smoke, Fire & Heat Detectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49	Guestroom Security Panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50	CCTV Surveillance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section III. Demographics**

Please circle one answer or fill in the blank. «Code»

1. Your gender is (check one) :  Male  Female
2. Education completed (circle one):  
 a. High School                      e. Some Graduate Work  
 b. Some College                    f. Masters Degree  
 c. Associates Degree                g. Doctorate Degree  
 d. Bachelors Degree                h. Other (please specify).....
3. How long have you been working in your present position?  
 a. Less than 1 year                d. 6-10 years  
 b. 1-2 years                            e. More than 10 years  
 c. 3-5 years
4. How long have you worked in the hospitality industry?  
 a. Less than 1 year                d. 6-10 years  
 b. 1-2 years                            e. More than 10 years  
 c. 3-5 years
5. Your position:  
 a. General Manager                e. Front Office Manager  
 b. Assistant General Manager    f. Food & Beverage Manager  
 c. Controller, Accountant          g. Owner  
 d. Sales & Marketing Manager    h. Other (please specify).....
- PROPERTY CHARACTERISTICS**
6. How many guestrooms are there at your property? .....
7. Which of the following segments best describes your property's price category?  
 a. Luxury                                d. Budget  
 b. Upscale                              e. Economy  
 c. Mid-priced                            f. Other (please specify).....
8. Which of the following best describes your property's location?  
 a. Downtown                          d. Highway  
 b. Suburban                            e. Resort  
 c. Airport                                f. Other (please specify).....
9. Which of the following best describes your property's type?  
 a. Convention Hotel                e. Extended-stay  
 b. Standard Hotel                    f. Bed & Breakfast  
 c. Motel                                 g. Conference Center  
 d. All Suite                            h. Other (please specify).....
10. What was your 1997 achieved average room rate?  
 a. Under \$ 30                         d. \$ 60 - \$ 84.99  
 b. \$ 30 - \$ 44.99                    e. \$ 85 - \$ 99.99  
 c. \$ 45 - \$ 59.99                    f. \$ 100 or more
11. Number of years property has been in business: .....
12. What percentage of all guest nights originate from:  
 - Travel Agents                      .....%  
 - Walk-in                                .....%  
 - Direct call                            .....%  
 - Central Reservation System      .....%  
 - Internet reservation                .....%  
 - Other (please specify)              .....%
13. Your sales are composed of :  
 - Business                              .....%  
 - Leisure                                 .....%  
 - Conventions                         .....%  
 - Government                         .....%  
 - Other                                    .....%
14. Which of the following best describes the ownership of your property?  
 a. Corporate                            d. Independent  
 b. Chain                                 e. Other (please specify) .....
15. Approximately, how many people are employed at your property?  
 Full Time: ..... Part Time: .....  
 Number of full-time equivalents: .....
16. Is there a Food and Beverage unit available in your property? \_\_\_Yes \_\_\_No
17. Please check (✓) all of the following associations in which you are a member?  
 \_\_\_ AH&MA                            \_\_\_ OH&MA                            \_\_\_ OTIA  
 \_\_\_ NRA                                \_\_\_ ORA                                \_\_\_ None

**THANK YOU**

If you would like to receive an abstract of the results of this study, please fax your name and address on a separate piece of paper to (405) 744 6299.

APPENDIX D

APPROVAL FORM FOR RESEARCH INVOLVING HUMAN SUBJECTS

OKLAHOMA STATE UNIVERSITY  
INSTITUTIONAL REVIEW BOARD  
HUMAN SUBJECTS REVIEW

Date: 07-07-98

IRB #:HE-99-001

Proposal Title: AN ASSESSMENT OF THE EFFECTS OF TECHNOLOGY APPLICATIONS IN  
LODGING PROPERTIES IN OKLAHOMA

Principal Investigator(s): Bill Ryan, Cihan Cobanoglu

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved


ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT  
NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE  
APPROVAL PERIOD.

APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR  
PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE  
SUBMITTED FOR BOARD APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

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Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Signature: 

Date: July 9, 1998

Interim Chair of Institutional Review Board  
and Vice President for Research

cc: Cihan Cobanoglu

## VITA

Cihan Cobanoglu

Candidate for the Degree of

Master of Science

Thesis: AN ASSESSMENT OF THE EFFECTS OF TECHNOLOGY IN OKLAHOMA  
LODGING PROPERTIES

Major Field: Hospitality Administration

Biographical:

Personal Data: Born in Istanbul, Turkey, September 24, 1971 the son of Ahmet Cobanoglu and Sukran Cobanoglu. Married to Gunay Afacan, January 6, 1996.

Education: Graduated from Bakirkoy High School, Bakirkoy, Istanbul, Turkey, in June 1989; received Bachelor of Science degree in Tourism and Hotel Administration from Cukurova University, Mersin, Turkey, in May 1994; completed the requirements for the Master of Science degree at Oklahoma State University, Stillwater, Oklahoma, in December 1998.

Professional Experience : Variety of entry level, supervisory, and management positions held at international properties, 1990-1994 Guide Assistant, Koday Yatching, Bodrum, Turkey, Front Office Clerk, Naz Hotel, Bodrum, Turkey, Phaelis Princess, Kemer, Turkey. Cost Controller and System Analyst, Ramada Hotel Mersin (International), 1994-1995. Eddie Restaurant, London, United Kingdom, 1995-1996. Restaurant Supervisor (Internship), Marriott International, Oklahoma City, Oklahoma, 1997. Teaching and Research Assistant, Oklahoma State University, 1996-Present.

Professional Organizations: Eta Sigma Delta, Club Managers Association of America, Council of Hotel, Restaurant and Institutional Educators, Oklahoma State University Hospitality Administration Graduate Student Association.