

THE IMPACT OF TECHNOLOGICAL AMENITIES ON  
CUSTOMER EXPERIENCE IN UPSCALE HOTELS

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## Abstract

Upscale Hotels operate in a highly competitive market and therefore place a strong emphasis on providing quality service and differentiation through the latest technological amenities. Nowadays, hotel companies are trying to follow the customers' desires in order to offer a unique experience. However, given the multitude of available technologies on the market today, hoteliers have little understanding of their guests' expectations and of which technological amenities will drive guest satisfaction. The literature review shows that not all the technological amenities implemented in hotels have been appreciated by guests. Since technological items change rapidly over time, the purpose of this study is to analyze the impact of current technologies and to assess the potential of the latest technologies on customer experience.

This study employed a two-step approach. In the qualitative phase an analysis of Portuguese upscale hotel websites was made as well as two interviews with hotel managers. In the quantitative stage a questionnaire was developed for hotel guests, generating a sample of 310 valid responses.

The results revealed that Internet access was the most important technology for both leisure and business travelers. The majority of respondents would like to add new technologies or change some of the existing ones for new technologies in order to improve their experience. The results also demonstrate that installing specific new technology can have a significant effect on enhancing guest experience.

**Keywords:** technology, upscale hotels, customer experience, technological amenities, satisfaction.

## Resumo

Os Hotéis de 4 e 5 estrelas operam num mercado bastante competitivo, portanto têm uma grande necessidade de fornecer um serviço de qualidade e com diferenciação através das inovações tecnológicas mais recentes. Hoje em dia, as empresas hoteleiras estão a tentar seguir as necessidades do consumidor com o objetivo de oferecer uma experiência única. Contudo, dada a grande variedade de tecnologias disponíveis atualmente no mercado, os proprietários dos hotéis têm alguma dificuldade em saber quais são as expectativas dos clientes, ou seja, quais as tecnologias que podem levar à sua satisfação. A revisão da literatura mostra que nem todas as tecnologias implementadas pelos hotéis têm sido apreciadas pelos hóspedes. Como os itens tecnológicos mudam com o tempo é importante fazer este estudo que tem como objetivo analisar o impacto das tecnologias atuais bem como avaliar o potencial das mais recentes tecnologias na experiência do consumidor.

A metodologia adotada para este estudo está dividida em duas fases. Na fase qualitativa foi feita uma análise a alguns websites de hotéis em Portugal, bem como duas entrevistas a gestores de hotéis. Na etapa quantitativa foi desenvolvido um questionário para os hóspedes e foi obtida um amostra de 310 respostas.

Os resultados revelaram que o acesso à internet é a tecnologia mais importante tanto para os hóspedes que viajam em lazer como em negócios. A maioria da amostra gostaria de adicionar novas tecnologias ou mudar algumas das que estão disponíveis atualmente por novas para melhorar a sua experiência. Os resultados demonstraram também que a instalação de novas tecnologias específicas pode ter um efeito significativo na melhoria da experiência do cliente.

**Palavras-chave:** tecnologia; hotéis de 4 e 5 estrelas; experiência do cliente; inovações tecnológicas; satisfação.

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## Table of contents

<b>Abstract .....</b>	<b>II</b>
<b>Resumo .....</b>	<b>III</b>
<b>Acknowledgments.....</b>	<b>IV</b>
<b>Table of contents.....</b>	<b>V</b>
<b>Sumário Executivo.....</b>	<b>XI</b>
<b>Chapter 1 - Introduction.....</b>	<b>1</b>
1.1. Problem Statement.....	1
1.2. Why Is It Relevant? .....	1
1.3. Goals .....	3
1.4. Methodology.....	3
1.5. Structure.....	4
<b>Chapter 2 - Literature Review .....</b>	<b>5</b>
2.1. Technology in the Hospitality Industry .....	5
2.2. Upscale Hotels .....	6
2.3. Customer experience vs. Customer satisfaction .....	6
2.4. Perception of Guest Technologies in the Hotel Industry .....	7
2.5. Technological Amenities and Guest Experience/Satisfaction .....	8
2.5.1. Guest Empowerment Technologies .....	8
2.5.2. In-room technologies.....	9
2.6. Business and Leisure Hotel Guests.....	12
2.7. Generations and Technology .....	14
2.7.1. A new breed of traveler - A luxury traveler of the future .....	16
2.8. Hotel of the future - technological trends .....	17
2.8.1. Impact of guestroom technologies when a guest is choosing a hotel.....	18
2.8.2. Internet .....	18
2.8.3. New trends in check-in and check-out processes.....	19

2.8.4. Hotel room key of the future - mobile application.....	22
2.8.5. Devices that controls guestroom experience - trends in 2015.....	23
2.8.6. Guestroom of the future (3120) - Novotel .....	25
2.9. Importance- Performance (Satisfaction) Model.....	28
<b>Chapter 3 - Methodology .....</b>	<b>30</b>
3.1. Research context .....	30
3.2. Research questions.....	32
3.3. Data Collection Methods .....	33
3.3.1. Qualitative research.....	33
3.3.2. Quantitative research.....	37
3.4. Statistical Methods.....	39
<b>Chapter 4 –Analysis and discussion of Results .....</b>	<b>40</b>
4.1. Sample Description.....	40
4.1.1. Demographic profile description.....	40
4.1.2. Details of the last stay in a Portuguese upscale hotel.....	41
4.2. Importance - Satisfaction Analysis .....	43
4.2.1. Descriptive statistics - Importance .....	43
4.2.2. Descriptive statistics - Satisfaction .....	44
4.2.3. Importance-satisfaction gap analysis .....	45
4.3. Last stay in a Portuguese upscale hotel .....	48
4.4. Importance of the latest technological amenities.....	50
4.4.1. Preferences of check-in/check-out, room control and ordering room service .....	51
4.5. Guests’ technological preferences across purpose of travel and generation.....	53
4.5.1. One way ANOVA - Purpose of travel .....	53
4.5.2. One -way ANOVA - Generations .....	54
4.6. Factor Analysis .....	60

4.7. Linear Regression Analysis .....	62
4.7.1. Guests are willing to pay extra for a guestroom with the latest technologies	62
4.7.2. The availability of new guestroom technologies impacts guest decision in choosing a hotel.....	63
<b>Chapter 5 – Conclusions .....</b>	<b>65</b>
5.1. Summary of results .....	65
5.2. Contribution for academic studies and for hotel managers .....	69
5.3. Study limitations and avenues for future researches .....	69
<b>References.....</b>	<b>71</b>
<b>Appendices .....</b>	<b>79</b>
Appendix I - Interview guide for hotel managers .....	79
Appendix II - Hotel guest questionnaire .....	81
Appendix III - Tables.....	87
Table III 1 - List of the twenty-five hotels with technologies analyzed .....	87
Table III 2 - Guests' company & purpose of travel .....	87
Table III 3 - Frequency of respondents in Portuguese upscale hotels.....	88

## List of Tables

Table 1. Main differences between Business and Leisure segments.....	13
Table 2. Synthesis of technology trends and their features .....	27
Table 3. Number of hotels in Portugal by Type .....	30
Table 4. Total revenues in 2014 by type .....	31
Table 5. Technological amenities in Portuguese upscale hotel websites .....	34
Table 6. Sample profile .....	40
Table 7. Details of the last stay in a Portuguese Upscale Hotel .....	42
Table 8. Descriptive Statistics - Importance.....	43
Table 9. Descriptive statistics - Satisfaction.....	44
Table 10. Cross-checking - T-test (Importance - Satisfaction) .....	45
Table 11. Satisfaction with technologies and their impact on guest experience. ....	49
Table 12. Importance of latest technological amenities .....	50
Table 13. Technological preferences to check-in/out, room control and order a service. .....	51
Table 14. New guestroom technologies and hotel selection .....	52
Table 15. Propensity of customers to pay for a room with new technologies and new hotel experience.....	52
Table 16. One-way ANOVA - Purpose of travel .....	54
Table 17. Generations and purpose of travel.....	56
Table 18. One way ANOVA - Generations.....	57
Table 19. Post Hoc Tests - Multiple Comparisons - Dunnett C.....	58
Table 20. Results of Factor Analysis for Technological Amenities.....	61
Table 21. Linear Regression Analysis .....	64

## List of Figures

Figure 1. Hotel guestroom technology between 1970 and 2000 .....	9
Figure 2. Importance - Satisfaction Matrix .....	29
Figure 3. Importance-Satisfaction Analysis Grid.....	46



## List of terms definition, acronyms and abbreviations:

**ATM** - Automatic teller machine

**Baby Boomers** - People born between 1946 and 1964 (Center for Marketing Effectiveness, 2005).

**CD/DVD** - Compact Disc/ Digital Versatile Disc

**CRM** - Customer Relationship Management

**Gen X (Generation X)** - People born between 1965 and 1976 (Center for Marketing Effectiveness, 2005).

**Gen Y (Generation Y)** - People born between 1977 and 1993 (Center for Marketing Effectiveness, 2005).

**GET: Guest Empowerment Technologies** - “Electronic systems and tools that allow hotel guests to have more personal control over their stay in a hotel.” (Erdem, Schrier, & Brewer, 2009, p. 18).

**HDTV** - High Definition Television

**HSIA: High-speed Internet Access** - Internet connectivity at speeds of 1 to 100 Megabits per second (Mbps) (Collins, & Cobanoglu, 2008).

**ICE** - Interactive Customer Experience

**In-room safe Electronic** - Safe that can be opened by an electronic card or personalized code (Collins & Cobanoglu, 2008).

**IPTV: Internet Protocol Television** - The convergence of multimedia services (e.g. television, video, audio, text, graphic, and data) delivered over Internet Protocol networks (Chang & Wang, 2006).

**NFC** - Near Field Communication

**PC** - Personal Computer

**PPV: Pay-Per-View** - Digital video, available over a television platform, available on a payment basis (Collins & Cobanoglu, 2008).

**SPG** - Starwood Preferred Guest

**TV** - Television

**VoIP: Voice Over Internet Protocol** - Use of Internet protocols instead of analog media to transfer voice data (Collins & Cobanoglu, 2008).

**3D** - Three Dimensions

## Sumário Executivo

Os Hotéis de 4 e 5 estrelas operam num mercado bastante competitivo, portanto têm uma grande necessidade de fornecer um serviço de qualidade e com diferenciação através das inovações tecnológicas mais recentes. Hoje em dia, as empresas hoteleiras estão a tentar seguir as necessidades do consumidor com o objetivo de oferecer uma experiência única. Contudo, dada a grande variedade de tecnologias disponíveis atualmente no mercado, os proprietários dos hotéis têm alguma dificuldade em saber quais são as expectativas dos clientes, ou seja, quais as tecnologias que podem levar à sua satisfação. A revisão da literatura mostra que nem todas as tecnologias implementadas pelos hotéis têm sido apreciadas pelos hóspedes. Como os itens tecnológicos mudam com o tempo é importante analisar com alguma frequência (2 em 2 anos) a importância dos mesmos para os hóspedes com o objetivo de melhorar a sua experiência e consequentemente aumentar a sua satisfação.

Este estudo foi desenvolvido com o objetivo de analisar o impacto das tecnologias atuais bem como avaliar o potencial das tecnologias mais recentes na experiência do consumidor nos hotéis de 4 e 5 estrelas.

Após a revisão da literatura, é apresentada a metodologia utilizada no estudo, onde é feita uma caracterização da indústria hoteleira em Portugal, uma descrição detalhada de todos os métodos usados na recolha de dados e também um resumo dos métodos estatísticos utilizados no desenvolvimento do estudo. Relativamente à recolha de dados, inicialmente foi feita uma análise aos websites dos hotéis de 4 e 5 estrelas em Portugal com o objetivo de identificar quais as tecnologias disponíveis atualmente. De seguida foram realizadas 2 entrevistas a dois gestores de hotéis e por fim, antes de distribuir os questionários aos clientes de hotéis Portugueses de 4 e 5 estrelas, foi feita uma fase de teste com uma pequena amostra de modo a detetar possíveis erros.

No capítulo IV referente à análise e discussão de resultados, foi feita uma descrição da amostra a nível demográfico e uma caracterização detalhada da última estadia do cliente num hotel de 4 e 5 estrelas em Portugal. De seguida foi efetuada uma análise para identificar quais as tecnologias atuais (19 tecnologias analisadas) mais importantes e com níveis mais elevados de satisfação para os clientes. Com base nesses dados foi desenvolvida uma matriz de Importância - Satisfação para obter uma melhor compreensão da relevância de cada tecnologia. Foi também analisado o impacto que as

tecnologias tiveram na experiência do cliente na sua última estadia, bem como a necessidade do cliente em ter novas tecnologias disponíveis para melhorar a sua experiência. Relativamente às tecnologias mais recentes (14 tecnologias analisadas) foi também efetuada uma análise com o objetivo de identificar as tecnologias mais importantes para os clientes. Após a identificação das preferências dos clientes para efetuar o check-in/check-out, para controlar o quarto e para fazer uma reserva de um serviço, está presente uma análise referente à disponibilidade dos hóspedes para pagarem mais por um quarto com as tecnologias mais recentes e outra em relação ao impacto que as novas tecnologias têm na decisão do cliente em escolher o hotel.

De seguida foi realizado um teste paramétrico One-way ANOVA para analisar as diferenças existentes nas preferências tecnológicas dos clientes de acordo com o propósito de viagem e com as gerações. O teste Post- Hoc foi também usado para comparar resultados entre pares de gerações. Com o objetivo de criar dimensões tecnológicas entre as 14 tecnologias mais recentes, foi usada uma análise fatorial. Para assegurar a adequabilidade desta análise e aferir a qualidade das correlações existentes entre as variáveis foram realizados os seguintes procedimentos estatísticos: Kaiser-Myer-Olkin e Test de Barlett. As dimensões encontradas foram as seguintes: tecnologias de conforto & conveniência, tecnologias de entretenimento, e acesso à Internet. Por fim, através de análises de regressão linear, foram identificadas as dimensões tecnológicas que têm um impacto positivo na disposição do cliente em pagar mais para ter um quarto com as tecnologias mais recentes e na decisão do cliente em escolher o hotel.

No último capítulo são apresentadas as conclusões, os contributos deste estudo para as pesquisas académicas e para os gestores de hotéis, assim como as principais limitações do estudo e implicações para estudos futuros.

## Chapter 1 - Introduction

### 1.1. Problem Statement

Now, more than ever, technology moves the world and companies cannot survive without using it. It has a significant impact on all businesses and the hotel industry is not an exception. Hotels are facing an increasingly competitive market and to differentiate themselves by providing excellent service is not enough. It is vital to offer something different to capture the customers' attention as hotel guests become more and more selective in their choices (Janes & Wisnom, 2003). In this new technological world it is becoming possible to deliver a truly personalized guest experience in order to exceed the customers' expectations (Accenture, 2012).

Today, leisure guests and business travelers are looking for a new experience. In fact, the customers' expectations for the newest technology continue to grow. The increasing up-take by clients combined with the shorter life cycles of this technology creates a big challenge for hotels. In the past, guestrooms provided access to a different experience with technology that people could not get in their homes. Nowadays, this has changed completely whereby in most cases what clients have in their homes is far superior to anything that is available in a hotel room (Horner, 2012). It is essential to provide in-room technology that reflects what is on the market now, what people are currently using (Trauthwein, 2012), if not greater. Travelers are beginning to think of hotel rooms as a home away from home (Parets, 2004). Therefore, there is an opportunity for hotels to embrace the next generation of consumer technology, investing in the technological amenities that guests' demand to achieve a competitive advantage in order to gain and retain guests.

### 1.2. Why Is It Relevant?

Technology has had a big impact on society and its ubiquity has grown substantially during the last decades. Therefore, hotels need to follow the evolution of technology to attract clients with a unique experience.

Several studies have shown the need for understanding what guests really want and their satisfaction with the available services and amenities. Therefore it is important to get

customer feedback in order to achieve a high level of guest satisfaction (Howell, Moreco & DeMicco, 1993; Skogland & Sigauw 2004).

Answering the call of a previous academic study, it is essential to replicate studies related with technology at least every two years, because of how significantly it changes over time (Bilgihan, Cobanoglu, & Miller, 2011). After bibliographic research of the existing scientific studies, where the correlation between technological amenities and guest experience is tested, it is evident that only a few studies have examined in-room technology at hotels, as it is a relatively recent development. However, in some studies the data showed that some new technology is not appreciated by guests (Bilgihan et al., 2011; Nasoz, 2011).

Taking all of these reasons into account, is critical to do this study to have an updated analysis of this issue. This study is also relevant because it is focused on the perceptions of both parties, managers and customers, as was recommended in previous research to provide a more comprehensive understanding of the study (Barker, Kandampully, & Lee, 2003). For the purpose of this study, an upscale hotel is classified with four to five stars. This study is about upscale hotels because was considered more interesting and useful study the impact of technologies in hotels that have more advanced technologies to their guests and that will invest more in new ones in the future. The upscale hotel guests have usually higher expectation, only reach satisfaction at higher levels, therefore this segment of hotels need to provide services incorporating new technologies to differentiate themselves offering a better guest experience.

The future technological amenities have been studied in a few hotels in the world with pilot rooms (for example the pilot room 3120 at the Novotel Vaugirard Montparnasse, Paris) to get customer feedback about the experience and thus understand the viability and up-take of these technological amenities by guests. If there is a positive impact from latest technological amenities on customer experience demonstrated in this study, the upscale hotels will probably invest more in technology to improve the guest experience, to generate revenue and to attract new customers, which can improve the tourism sector and also the economy of the country.

In summary, this study will be useful, mainly for upscale hotels because they will have access to customers' feedback, giving them the opportunity to enhance the guest

experience with the technological amenities that customers prefer. If hoteliers decide to make changes in the technological amenities using the customers' opinion, this study will also have a great benefit to customers.

### **1.3. Goals**

As was mentioned before, hotels are facing a competitive market and in order to be successful hotels are trying to meet customer needs with new technology. Therefore, it is important to explore if current technological amenities continue to have a positive impact on guest experience, analyze if upscale hotels are upgrading technology in order to provide better guest experience and find out if the latest technological trends will enhance customer experience in upscale hotels. Given that technological amenities are essential to a hotel stay (Beldona & Cobanoglu, 2007), the main goals of this study are the following:

- Analyze the impact of current technologies on customer experience in upscale hotels.
- Assess the potential impact of the latest technologies on customer experience in upscale hotels.

### **1.4. Methodology**

In order to successfully achieve the main goals above it was necessary to review the existing literature regarding the technological amenities in hotels. The websites of Portuguese upscale hotels were analyzed in order to identify the available technological amenities for guests. Previous studies focus on the type of tools used to analyze the impact of technology on customer experience and satisfaction (Bhangu, 2013; Nasoz, 2011). The questionnaire for this thesis for hotel guests was developed based on the questionnaires in these studies. Additionally, two interviews with managers of Portuguese upscale hotels were conducted mainly to analyze which technology they are planning to implement in the future but also to understand if there is congruence between the managers' perception regarding the guests' technological demands and desires, and guest perception. After the interviews, a first version (pre-test) of the questionnaire was tested with a sample of 10 respondents in order to detect some possible needs for improvement. After this phase, the questionnaire was distributed to upscale hotel guests in Portugal.

## 1.5. Structure

The thesis is divided into five chapters:

**Chapter 1 - Introduction** – Presented here are brief considerations concerning the problem statement, the scientific and practical implications of the study, the main goals, methodology and finally the global structure of the thesis.

**Chapter 2 - Literature Review** – The five main topics are focused on: hospitality industry, technological amenities, customer experience/satisfaction, technological preferences across purpose of travel and age, and the ‘hotel of the future’ - technological trends.

**Chapter 3 - Methodology** – This chapter describes how this research was conducted, with careful explanations of the data collection methods and procedures used. The research questions are identified.

**Chapter 4 - Results** – Statistical analyzes are made to analyze the data collected. Hypotheses are tested and findings are analyzed and discussed.

**Chapter 5 - Conclusions** – The results are analyzed and the contribution of this study for upscale hotels and for academic research is presented. The limitations are considered and hints for future developments and investigation are provided.



## Chapter 2 - Literature Review

### 2.1. Technology in the Hospitality Industry

According to ITEEA's Standards for Technological Literacy, Content for the Study of Technology (STL), technology is defined as "the modification of the natural world to meet human wants and needs (ITEA/ITEEA, 2000/2002/2007)". It is the application of scientific discoveries to the production of goods and services to improve the human environment (Winborne, 2003).

Technology in hotels is often applied at two different levels: operational and managerial level, and for in-room guest service (Barker et al., 2003). According to the American Hotel and Lodging Association survey, hoteliers with more than ten years of industry experience identified increasing guest satisfaction (82.4%), increasing employee efficiency (79.9%) and generating revenues (71.3%) as the primary goals for the use of information technology (Brewer, Kim, Schrier & Farrish, 2008). Therefore, technological amenities are normally introduced in this industry to improve the performance of the hotel staff, allowing them to work with more efficiency and also to enhance customer satisfaction (Collins & Cobanoglu, 2008). Many hotels use technology as a value-added amenity to help create differentiation, enhance guest satisfaction, and build loyalty among customers (Cobanoglu, Ryan, & Beck, 1999). During the last years, information technology has significantly changed the way the hotel industry conducts business. Olsen, Connolly, and Allegro (2000) identified Information Technology (IT) as the single greatest force driving change in the hospitality industry.

Previous studies indicate that hotel technology implementations can improve customer satisfaction, increase productivity and reduce costs, which can result in a competitive advantage. (Camisón, 2000; Cobanoglu, Corbachi & Ryan, 2001; Collins & Cobanoglu, 2008, David et al., 1996; Siguaw & Enz, 1999; Van Hoof, Verteeten, & Combrink 1996). However, not all technologies positively impact guest satisfaction (Cobanoglu et al. 2001) and an incorrect choice of technological amenities may result in customer dissatisfaction (Cobanoglu, 2009). Therefore, it is critical to understand what hotel guests need and want. This knowledge will help hoteliers decide which products or services they should provide or adjust existing offerings in a way that is more appealing

to guests, meeting their requirements and expectations (Kotler, Bowen, & Makens, 2003; Lazer, Dallas, & Riegel, 2006).

## **2.2. Upscale Hotels**

The lodging industry sector is generally classified into six categories: luxury hotels, upper-upscale, upscale, upper-midscale, midscale and economy (Miller et al, 2013). "Upscale hotels are sometimes categorized as part of the luxury hotel sector" (Digital Luxury Group, 2013) because "luxury is a very subjective notion and no single criteria could comprehensively define whether a property is luxury or not" (Chu, 2014). For the purpose of this study, an upscale hotel is defined as a hotel that offers luxury amenities and that is classified with four to five stars. This study examines the upscale hotel segment, the hotels with four to five stars in Portugal. The guests of these types of hotels expect to have an elegant environment, a broad number of facilities and services, and the latest technology such as High-speed Internet Access (HSIA), CD/DVD sound systems, High Definition Television (HDTV) and more. Those hotels offer a high level of quality and comfort. They achieve excellence in every facet of hospitality and are known for their beautiful architecture, landscaping, interior design, and exquisite taste. According to a study, upscale/luxury hotels are 18.2 % more likely to implement hotel technological amenities than economy/mid-range hotels in the next three years (Jung, Kim & Farrish, 2014) in order to increase the quality of the service and consequently achieve their guests' expectations. They must follow the latest technological trends to be competitive in their segment and to enhance the guest experience. On the other hand, economy and midscale hotels are more likely to implement technology to increase their operating efficiency (Siguaw, Enz & Namasivayam, 2000).

## **2.3. Customer experience vs. Customer satisfaction**

According to Meyer & Schwager (2007) customer experience includes all the aspects that a company is offering — the quality of service, advertising, packaging, product and service features, ease of use, and reliability. Customer experience is a complex process of understanding the customers' conscious and subconscious perceptions of their relationship with the organization from all their interactions. Nowadays, customer experience has become a critical differentiator in this competitive, global marketplace.

Good customer experience management can improve customer loyalty, strengthen brand preference, boost revenue, and lower costs (Espana, 2006).

Customer satisfaction is a result of the customers' experience, often measured as a degree of "happiness". It can be defined as a customer' state of mind in which their needs and expectations have been met or exceeded with a product or a service. It is described as the link between perceived quality and post-purchase evaluations. Customer satisfaction can result in a subsequent repurchase and prolong loyalty (Yi, 1991).

#### **2.4. Perception of Guest Technologies in the Hotel Industry**

The hotel industry is often criticized for being slow to implement the latest technologies in guestrooms as opposed to overall operations (Siguaw et al., 2000). In order to change this perception, an industry forum of technology started in 2006 the "In-Room Technology Workgroup" aimed at developing the guestroom of the future, GUESTROOM 20X (Barnes et al., 2012).

According to a recent study in Hospitality Technology (2013), hoteliers faced a big challenge: the need to meet customers' higher demands combined with lack of sufficient budgetary resources to implement new technologies. Another challenge for hotel operators is the rapidly changing technology that causes shorter life cycles (Horner, 2013). Based on the novelty theory, hotel guests might initially have a strong interest in using new technology purely out of curiosity (Hirschman, 1980); however, the novelty effect decreases as guests become competent in using the new technology (Beldona & Cobanoglu, 2007).

Nevertheless, to meet the guests' growing interest in having technology in their rooms, hotel companies started to implement technological amenities faster in order to meet customer needs and also to be competitive (Barnes et al., 2012). Therefore, it is crucial for hoteliers to invest in the proper technology, turning the challenges into opportunities and gain a competitive advantage.

## 2.5. Technological Amenities and Guest Experience/Satisfaction

It has been stated that technology is a critical determinant for hotel guest satisfaction (Singh & Kasavana, 2005) and for hotel selection (Cobanoglu, 2001). According to a related study, technology can enhance guest experience and is a substantial factor impacting guest satisfaction. This study found three significant variables: in-room technologies (Voice over Internet Protocol (VoIP) telephone services, Pay-Per-View (PPV) movies, voicemail, game systems and universal battery charges), business essentials (business center services, express check-in/check-out, in-room telephone, alarm clock, and easily accessible electronic outlets) and Internet access. However the variable comfort technologies (in-room electronic safe, guest control panel, in-room PC, mobile access to hotel website, electronic lock, and flat screen HDTV) is the only category that has no impact on hotel guest satisfaction (Cobanoglu, Berezina, Kasavana, & Erdem, 2011). Hotel companies tend to have more available resources for monitoring the guest experience because of the clear emphasis on experience and satisfaction customers have when selecting a hotel (Whitford, 1998).

### 2.5.1. Guest Empowerment Technologies

Guest Empowerment Technology (GET) is self-service technology specifically designed to give hotel guests more personal control over their stay without direct intervention from hotel employees. Some examples of GET are in-room check-out systems, check-in and check-out kiosks in the lobby, in-room entertainment systems, mobile applications, online reservations systems and others. (Erdem, et al., 2009).

According to Van Hoof, Verbeeten, & Combrink, 1996, GET aims to enhance the guest experience with more comfort while saving on labor costs and facilitate hotel operations. For example, the installment of check-in kiosks reduced the amount of labor required for reservation activities, so the staff had more available time for additional tasks in order to increase their level of customer service and consequently enhance guest satisfaction (Erdem, et al., 2009). However, a related study shows that one of the five attributes with the lowest overall satisfaction was self-check-in (Usta, Cobanoglu, Berezina, 2011). Nevertheless, a recent study of 106 respondents shows that about 80% of the guests would prefer to use self-check-in methods such as kiosks, online or other rather than go to the front desk. Guests prefer to replace long waiting lines with

convenient and less time-consuming technology facilities (Bhangu, 2013). Another related study at the Cornell University Center for Hospitality Research found that one of the guests’ favorite technology applications was the self-check-out service (Verma, Victorino, Karniouchina, & Feickert, 2007).

The result of using the GET is not only a reduction of labor costs but also the increase of customer satisfaction. Therefore, the hotel managers should consider using them to have a competitive advantage and to meet customer expectations as guests will expect to find GET in their rooms (Erdem et al., 2009).

**2.5.2. In-room technologies**

A study found that hotel operators invested more in in-room technology than any other technology for three consecutive years. The top two in-room technology projects planned to be implemented within 18 months are networking (for example, increasing wireless Internet access) and upgrading TVs (Hospitality Technology, 2013). A recent survey of lodging operators found that 62.5% of them reported "successfully" or “very successfully" enhancing customer experiences using in-room technology over the past three years. Only 6.4% believed that in-room technology did not enhance customer experience. And 25% of the respondents reported that in-room technology installations have generated additional revenues. On the other hand, 31.4% stated that the installed in-room technology did not have a positive effect on revenue (Jung et al., 2014).

According to DeMicco & Cobanoglu (2009), technology in the hospitality industry started in the early 1970’s and has been quickly evolving. Figure (1) shows the evolution of guestroom technology between 1970 and 2000.

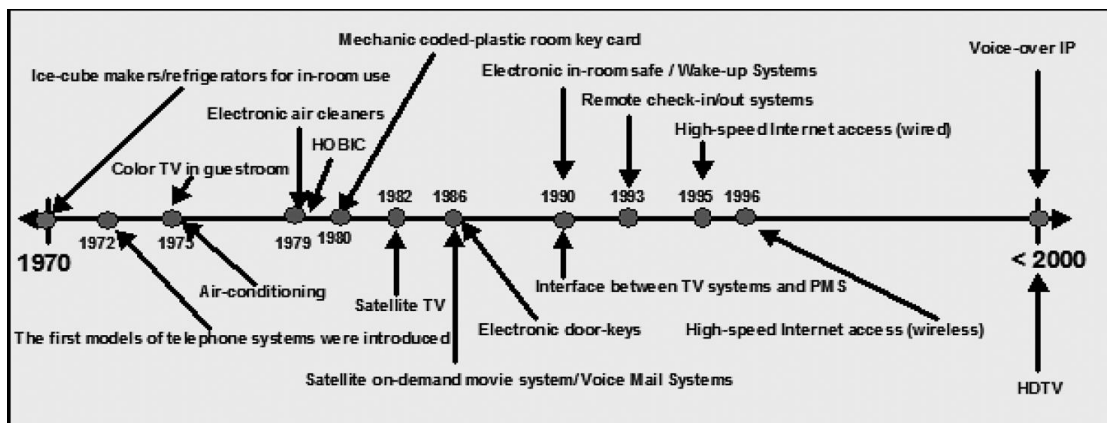


Figure 1. Hotel guestroom technology between 1970 and 2000

Source: DeMicco, F., & Cobanoglu, C., (2009), p. 96

The implementation of in-room technology has not only improved the in-room services but also provided new ways of entertainment (Barker et al., 2003). The guestroom experience has changed dramatically over the years. In order to provide service with more comfort and convenience to customers, hotel companies are gradually changing the area of in-room entertainment, introducing modern technology into their rooms (Sieburgh, 2009).

In the past, entertainment options were limited. But today with the rapid growth of technology, consumers have multiple entertainment options at their fingertips. They expect that hotels will offer at least the same level of amenities as they have in their homes, what they currently using (Trauthwein, 2012), or greater. Guests are using technology like high-speed Internet, high-definition TV, digital entertainment devices and VoIP in their daily lives. Many hotel guests think of a hotel as a home away from home (Parets, 2004).

A study of hotel managers found that in-room entertainment systems ranked second behind wireless Internet as the technology that hotel guests care about most. (Brewer et al., 2008). This increasing level of guest expectation leads hotels to offer more rooms with diverse technological devices of entertainment. According to Microsoft, in-room entertainment is one of the fastest growing revenue generating opportunities in hospitality.

Some studies indicate that several in-room technologies are being introduced to provide better guest experience (Erdem et al., 2009; Cobanoglu et al., 2011). For example, in 2010 Marriott International tested its Internet Protocol Television (IPTV) initiative in the guestrooms of a pilot hotel - Courtyard Seattle Downtown/Pioneer Square in Seattle, WA. in order to enhance the level of guest experience. According to Neil Schubert, Vice President of Information and Technology for Marriott, the IPTV initiative will allow hotels to provide an interactive service to guests in order to give them the possibility of having a similar experience to the one they have in their homes because half of guests do not travel with their laptop electronic devices with them while traveling and 67% want to use them with the hotel entertainment system (Hotelmarketing, 2008).

At the present time, hotels, especially the upscale and luxury hotels, are competing to provide service with the latest technology for their customers. However a related study

showed that a significant number of customers do not appreciate many of these investments. Some technological entertainment amenities are a low priority for guests, such as, gaming consoles, Internet on TV and in-room fitness amenities. Whereas, other technology such as, Free-To-Guest TV, Guest-Device Connectivity and HSIA are very important to customers and contribute to their high level of satisfaction. However, some amenities need special attention because they were rated as important by guests but with a low satisfaction rating. These included music, universal battery charge and in-room desktop PCs (Bilgihan, et al., 2011).

Peliz Nasoz (2011) did a study through an online survey with a sample of 508 respondents examining 18 in-room technologies and found that the following were perceived by hotel guest as the most important technologies: in-room movies, On Demand services, in-room high-speed wireless Internet service, HDTV content, in-room temperature control, in-room electronic safe, connectivity panels and all-in-one guestroom control units. He also found that they were satisfied with the performance of these technologies and would therefore like to use them during their hotel stay to enhance their experience. Alternatively, these three relatively new technologies were classified by guests as not very important: 3D television, Internet on the TV, and guestroom lock access via mobile phone. Finally, the technology classified as less important but with strong performance were: in-room check-out system through the TV, in-room video viewing of guest profile, and voicemail (Nasoz, 2011). A similar study found that HSIA, express check-in and check-out, and remote control for the TV were ranked as having high importance and as high performance technology by guests, who categorized it as "Keep up the good work". On the other hand, some technology such as videoconferencing capabilities, wireless access to the hotel website, business center and plasma screen TV's were classified as "low priority" for guests, ranked as low performance and low satisfaction (Beldona & Cobanolgu, 2007).

In sum, while hotel operators are investing in technology, not all of it has been appreciated by the guests, as was observed in the gap between the importance and satisfaction level for technological amenities. Therefore, it is important to explore the customers' opinion to understand: what is the impact of technological amenities on the customer experience in upscale hotels and to learn which technologies are really important for guests. This is one of the purposes of this study.

## 2.6. Business and Leisure Hotel Guests

A business traveler is an individual who travels for business purposes, defined as "all non-discretionary trips which occur either explicitly for the purpose of engaging in work, or incidentally in the course of conducting work-related activities" (Jones, 2002). However, an increasing number of people travel for leisure. (Center for Marketing Effectiveness, 2005). They are called leisure travelers or individuals who travel for pleasure (Jones, 2002).

According to research performed by the American Hotel & Lodging Association (2014), in 2013, 41% of hotel guests traveled for business and 59% traveled for leisure purposes. These two segments of travelers have different wants, needs and travel patterns and thusly are assumed to have different demands (Radder & Wang, 2006).

In the past, the differences between business and leisure travelers across technological preferences were more significant. More recently, business travelers are not the only ones who want to be connected; leisure guests are devouring digital content more than ever before causing the lines between business and leisure guests to be more and more blurred (Murray, 2013). According to Hotels.com's 2013 Global Hotel Amenities Survey, both business and leisure travelers identified free Wi-Fi as the most important amenity when they choose a hotel. Wi-Fi is considered to be a must-have in a hotel, much more important than free breakfast, free parking or a swimming pool.

Despite the growing interest of leisure guests in technology, only a few of the studies showed that there was no difference between these two segments regarding technological preferences. One study found that today's leisure travelers give as much importance to in-room technologies as business travelers (Nasoz, 2011). However, the majority of studies continue to find some differences in guests' technological preferences across the purpose of travel. A study with 616 respondents indicates that the need for Wi-Fi service in a hotel is higher for business travelers than leisure travelers. The study shows that 44.7% of leisure travelers didn't use the Wi-Fi service during their stay while some used it on their laptops (34.1%), smartphones (10.6%), and other devices (13.6%). Compared to the leisure travelers, most business travelers used the Wi-Fi service (80.9%) with their laptops (63.6%), smartphones (10.9%), and other devices (11.8%) (Lee & Tussyadiah, 2010).



Many of today's leisure travelers bring their devices with them when they are traveling and increasingly demand in-room high-speed Internet (Center for Marketing Effectiveness, 2005). However, more business travelers prioritize free in-room Wi-Fi than leisure travelers. Business travelers are much more likely than leisure travelers to use the hotel application to book a room. A study showed that 60% of business travelers who booked their hotels on a Smartphone used a mobile application, as compared with 36% of leisure travelers (Google Traveler Study, 2014). In Table 1 are highlight the main differences between business and leisure guests.

**Table 1. Main differences between Business and Leisure segments**

<b>Leisure traveler</b>	<b>Business traveler</b>
Travel in leisure time	Travel on working time
Travels relatively <b>infrequently</b>	Travels relatively <b>frequently</b>
Averagely <b>longer trips</b>	Takes <b>trips that are shorter</b> in duration.
Plans trips generally medium time scale (few weeks to a year).	The planning period can be very short to very long for conference delegates (months to years).
Travel with <b>friends and family.</b>	Usually <b>unaccompanied</b> or with <b>colleagues.</b>
<b>Generally more price sensitive:</b> They spend more time deciding on the most suitable hotel for their travels and also make a greater effort to find the best possible deal for their stay.	<b>Location is key:</b> hotel's location is one of the top priorities, a convenient location that is close to their conference or convention venue that will allow them to go to their meeting point in a short time frame.
<b>Strong consideration for reviews and recommendations:</b> they turn to their family, friends, colleagues and online reviews for recommendations more so than business travelers who rely on company recommendations and also online reviews.	<b>Make more loyalty guests:</b> Due to the higher frequency of travel and less time spent on the booking process they have a higher tendency to stick with certain hotels that meet their criteria compared to leisure travelers. A lot of them belong to a hotel loyalty program.
<b>Greater attraction to packages and specials:</b> They are always looking for packages with different activities, events to improve their experience.	<b>Emphasize the necessity for all-inclusive amenities:</b> amenities like continental breakfast, a coffee maker, ironing board with iron, minibar, functional air conditioner and fully equipped bathroom are essentials.

<b>Leisure traveler</b>	<b>Business traveler</b>
<b>Desires extra on-site hotel facilities</b> (ex: a pool, fitness area or a restaurant).	<b>Business center and meeting space</b> are extremaly important to have all conditions to work. They also need <b>comfortable lobby</b> and lounge (for working, relaxing, networking, and socializing).
<b>More time available</b> to ask the front desk associates for recommendations.	<b>Less free time</b> - they want fast service (ex: check-in/check-out using self-service methods such as online or kiosks and efficient breakfast)
<b>Digital involvement is less important</b> for them: less likely to use hotel applications.	<b>Strong interest in a digital involvement</b> with hotel : including a variety of mobile application that make travelling to work easier.
<b>They want to be connected:</b> lower need for Wi-Fi service.	<b>They need to be constantly connected:</b> higher need for wi-fi service: constantly using their mobile phone or other devices to remain connected with their clients and colleagues during their business trips.

Source: Davidson & Cope (2002); Lee & Tussyadiah (2010); Magnani Caruso Dutton (2013); Weed (2013); <sup>1</sup>and <sup>2</sup>.

The results from previous studies suggest that technology is more important for business travelers than for leisure guests. Since the preferences of guests can change over time, it is also significant to discover the importance of technology according to the purpose of travel. The research hypothesis aimed at testing this is as follows:

H1: The latest technologies are more important for business travelers than for leisure guests.

## 2.7. Generations and Technology

According to a paper by the Center for Marketing Effectiveness produced in collaboration with Hotel Next Generation, every generation uses technology in a different way. The report divided hotel guests in three generations: Baby Boomers (born between 1946 and 1964), Generation X (Gen X - born between 1965 and 1976) and Generation Y (Gen Y - born between 1977 and 1993) (Center for Marketing Effectiveness, 2005). In the past, hotels focused mainly on attracting Baby Boomers but now Gen X and Y have more opportunities to travel than ever before. Therefore hotels

<sup>1</sup> <http://www.e-marketingassociates.com/understanding-differences-business-vs-leisure-travelers/>

<sup>2</sup> <http://innlink.com/business-vs-leisure-hotel-guests/>

have to attract and concentrate on the younger travelers (Lussan, 2011). A related study found that the level of importance for some technology is different across generations (Nasoz, 2011). When compared with all other generations, Gen Y assigned significantly high importance to many technologies such as: in-room video On Demand, guestroom lock access via mobile phone, and new technology phones with visual displays. Younger generations (Gen Y and Gen X) gave significantly more importance to connectivity panels. Some technology such in-room movie On Demand services, in-room wireless HSIA, and electronic in-room temperature control units are considered important not only for Gen Y, but also for Gen X and Baby Boomers. It was only the silent generation (born after 1945) that gave less importance to these technologies. Despite the differences across generations, only the connectivity panel showed a significant difference between Gen X and Baby Boomers (Nasoz, 2011). According to AARP & Microsoft, Baby Boomers are open to new technology, because they believe that it can enhance their lives. The technologies most used by Baby Boomers are television and Internet (Center for Marketing Effectiveness, 2005). However, they are less likely to become early adopters because safety and privacy are more important for them than for other generations. Younger travelers have grown up in a world where technological advances were easily integrated into their lives. Therefore, they are more naturally early adopters of technology (AARP & Microsoft, 2009).

Gen X and Gen Y give a lot of importance to technology, although from different perspectives. While Gen X tends to use technology that makes life easier, saves time and are comfortable doing their banking and shopping online, Gen Y prefers to use technology to socialize and entertain. For this generation, technology is a part of their lives (Forrester Research, 2008). Gen Y is the most technology savvy generation. (Forrester Research, 2008; Center for Marketing Effectiveness, 2005) and Gen X is still behind Gen Y in terms of the number of technologies deemed as important (Nasoz, 2011). However, both generations tend to prefer hotels that offer high-speed Internet and iPads (Lussan, 2011). They expect to remain connected wherever they go and continually look for new ways to access and interact with their personal content (Chin, nd).

In order to meet the preferences, needs and desires of their customers across generations hotels should be aware and provide a range of technological amenities (Center for

Marketing Effectiveness, 2005). The assumption according to previous studies is that technology is more important for younger generations (X and Y) than for Baby Boomers. Consequently, the research hypothesis is the following:

H2: The latest technologies are more important for younger generations than for Baby Boomers.

### **2.7.1. A new breed of traveler - A luxury traveler of the future**

The hotel experience is changing and hotels need to embrace the demands of modern travelers. According to Jenny Hsieh, Vice President of Strategy and Innovation at Marriott International, they had to create new and innovative ways to differentiate their brand (Doyle, 2014).

Michael Levie, CEO of CitizienM<sup>3</sup>, said that the hotel industry has completely lost the essence of what the new segment of traveler wants. This industry tends to be the last to respond to change, however hotel companies are beginning to understand and follow the needs of the modern travelers (Waldthausen & Oehmichen, 2013).

The new breed of travelers wants to be in places that understand them; they are no longer looking for the bellboys to carry their luggage up to their room or a concierge. These young travelers (between 18 and 35 years old) want to feel at home with the amenities they use every day, connected to the world and feel that they can become part of the experience. According to Michael Levie, the luxury traveler today is very different: they arrive to the hotel by some form of public transportation, wearing a t-shirt and do not give as much importance to the old status symbols; they do not seem to see money as a way to show-off. The CEO of 25 hours Hotel Hafencity, Christoph Hoffmann, states that modern-day travelers are not looking for a room filled with luxury items; they consider luxury to be having a very good experience (Waldthausen & Oehmiche, 2013).

Young travelers are connected to the web at all times with one or two devices in their pockets. This new generation of millennials cannot imagine their days without technology. They are seeking for unique experiences and they want to find a hotel that

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<sup>3</sup> CitizenM is a Netherlands based hotel chain.

can provide them a different experience, new style, design and service. This new breed of traveler is looking for hotels with something distinctive from the others and where guests can stay in a simple, comfortable place that is connected with the world (Waldthausen & Oehmiche, 2013). The concept of hotel lobbies is changing as a result of this new generation. They are becoming social hubs, more comfortable, community-like and homely because, According to Michael Tiedy, the Senior Vice President of Brand Design & Innovation at Starwood Hotels and Resorts, millennials like to be "alone, together". They like to be part of the experience by interacting with people to share their experiences, emotions and learn more about the country's culture. These new areas can also function as meeting spaces. Tim Walton, Vice President of International Development at Marriott Hotels, observed that "people are mixing work and play in this social setting and want to feel immersed in the city life that surrounds them". The service is also changing, becoming more informal, respectful and natural.

This study shows that some hotels are indeed bracing themselves for a new generation of millennials. However, it will take the hotel industry some time to acquire the changes necessary in order to provide a unique experience. The luxury market will soon have to make a revolutionary change to keep up with these modern customers that will dominate the market. Therefore, the first ones to act will certainly have a competitive advantage in capturing this new segment of travelers (Waldthausen & Oehmiche, 2013).

In summary, it is important to understand what the technological preferences of each type of guests are and if they have changed with the evolution of technology. Hence, this is another purpose of this study.

## **2.8. Hotel of the future - technological trends**

The hotel of the future will be completely personalized, using customer's preference data and advanced customization technology (Doyle, 2014). According to a study with 600 respondents, 95% of guests expect that "hotels will increasingly look to new technologies to drastically increase efficiency, reduce costs, personalize the customer experience and improve service" (Talwar, 2012). In order to improve guest experience some technological amenities are being tested and introduced in a few hotels worldwide and others are upgrading to follow the technological evolution and guest expectations.

The role of some in-room technological amenities is changing, like TVs. Modern digital travelers want to use the entertainment at hotels in the same way they do at home, through online services with their own devices, tablets or laptops. It is, therefore, increasingly likely that customers will pay less attention to an in-room TV (Horner, 2013).

In 2011, an American study found that 81% of hotel guests were not ordering PPV entertainment. With all the entertainment options that travelers have through online services via their laptops, PPV in hotels became a thing of the past, replaced by a bring-your-own entertainment culture (Horner, 2013).

### **2.8.1. Impact of guestroom technologies when a guest is choosing a hotel**

According to a survey with a sample of 508 respondents, nearly half of them agreed that the availability of new guestroom technology impacted their decision when choosing a hotel. Only 17.5% said that in-room technology has no impact on their decision when choosing a hotel. When asked if they would be willing to pay extra for a guestroom with the latest technologies, 36.1% said yes while 34.8% answered no. The remaining participants in the sample answered "Neither agree nor disagree". Almost a quarter of the respondents (24%) indicated that they would pay \$1 to \$10 more to stay in such a room; 19.9% were willing to pay \$11 to \$20; and 10.8% reported that they would pay \$21 to \$30 more (Nasoz, 2011). Although most guests may not be willing to pay for in-room entertainment technology amenities, one survey with 408 travelers (Bilgihan, 2012) reported that some guests are willing to pay \$1 to \$5 to have video On Demand (59%), music (15%), game consoles (41%), Internet on the TV (36%), and HSIA (18.4%). Another study with 408 respondents showed that, when deciding on a hotel, the two most important in-room entertainment technology amenities for leisure and business travelers are a free-to-guest TV and high-speed Internet access (Bilgihan, et al., 2011).

### **2.8.2. Internet**

The Internet is one of the most important amenities for guests in a hotel (Karadag & Dumanoglu, 2009). A study of 1.2 million guests concluded that 71% of guests consider the speed of their Internet connection as a key factor in their choice of hotel (iBAHN, 2011). In another survey with 1,800 hotel guests, 89.6% said that in-room Internet is

very important and 66.5% stated that in-room Internet affects their decision when choosing a hotel (Hotel Internet Services, 2010). For almost all segments of hotel guests, but particularly for upscale guests, wireless Internet is the most important amenity among items such as complimentary breakfast, bedding and pillow choices, pillow top mattress and free parking (Greif, 2010).

What hotel guests really want is fast Internet like they have at home for free. Although most hotels offer free Wi-Fi for their guests, and it is considered a basic service, an increasing number of hotels are adopting a tiered pricing program. This is a plan hotels use to cover the expensive costs where customers have to pay for access to faster Internet and to connect more than one device (Horner, 2013). However, the 2012 North American Hotel Guest Satisfaction Index Study suggests that charging guests for Internet use can have a negative impact on customer satisfaction (J.D. Power, & Associates, 2012).

In order to enhance their guest experience, the Hyatt Hotels Corporation decided to offer free Wi-Fi to Hyatt guests worldwide. In February 2015, Hyatt guests will have access to free Wi-Fi on an unlimited number of mobile devices and laptops in hotel rooms and social areas. According to Kristine Rose, Vice President of Brands for Hyatt, Internet connectivity has become a crucial part of guests' daily lives so it is no longer an amenity but a basic service that they already expect. Hyatt employees focus on understanding the real needs of their guests in order to make their experience more personal and seamless (Hospitality Technology, 2014).

One of the ways to meet the high expectations of tech-savvy customers is to upgrade their Wi-Fi networks. Some hotels decide to do it to improve the experience for mobile device users during their stay. One example is the Mandarin Oriental Hotel in New York that has seen an 85% decrease in Internet-related complaints after the upgrade (Yu, 2012).

### **2.8.3. New trends in check-in and check-out processes**

In recent years hotels have trying to enhance the guest experience with modern technology applied in different areas, one example is in the check-in/check-out process.

### **2.8.3.1. Kiosk**

Increasingly, hotels around the world are adopting an electronic and Kiosk check-in in order to simplify, personalize and speed up the process, allowing guests to go directly to their rooms (Weed, 2013).

According to Tyler Craig, Vice President and General Manager for the NCR Corporation's travel business, guests don't want to wait in line for the front desk anymore because they are using ATMs at the bank, online check-in at airports and now expect to find the same efficiency when they arrive at a hotel. Joseph Lema, Assistant Professor at Goodwin's Hospitality Management School at Drexel University and David Nadelman, General Manager of the Grand Hyatt San Francisco said that different check-in methods are meant to provide options for guests. However, they caution that self-service technology cannot be used as a substitute of service; it has to be used to facilitate service. Each type of guest has their own preferences. While leisure guests have more time available to ask the front desk associates for recommendations, business travelers prefer to check-in using self-service methods such as online or kiosks (Weed, 2013).

Between these two self-service methods, Henry H. Harteveldt, Co-Founder and Head of Airline & Travel Research and the Atmosphere Research Group, advised hotel managers to invest the same money they would have in kiosks with an online application that allows guests to more easily and quickly check-in and check-out (Weed, 2013).

Before its grand opening, Sana Evolution, a new hotel that opened in Saldanha in February 2015, released a statement saying that it would be incorporating technological innovations such as self-service check-in, E- hosts to help guests and more.<sup>4</sup>

### **2.8.3.2. Digital check-in and check-out**

While check-in kiosks and other methods of avoiding the front desk line have become more commonplace at hotels, integration of mobile check-in has seen a rapid expansion across the hotel industry (Baker, 2014).

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<sup>4</sup> <http://evolution-hotels.com/en/lisboa/this-is-your-hotel/hotel-concept>



In 2008, Omni Hotels was the first hotel brand to provide the online check-in process as a mobile website function. This new technology gave guests the opportunity to check-in before they even arrive at the hotel, ensuring that guestroom keys are ready and waiting for them at the front desk (Baker, 2014).

Another example is Marriott Hotels<sup>5</sup> who announced a significant expansion of the mobile check-in and check-out process in 2014. By August of 2014 Marriott International had already made the mobile check-in and check-out process available to Marriott Rewards members at 1,200 properties worldwide. Using the Marriott Mobile Application, guests who are members can check-in starting at 4 p.m. on the day before their arrival. When guests arrive at the hotel they only have to pick up the key card that is waiting for them at a specific mobile check-in desk.

By the end of 2014, one of the largest hospitality companies in the world, Hilton Worldwide<sup>6</sup>, announced that it was the first one to provide to their Hilton HHonors members a digital check-in, where guests can sign-in to their account via mobile device, tablet or computer. This technology also gives them the ability to choose their own room from digital floor plans, and not just the type of the room but the exact location in the hotel as well as the room number. After choosing a room, guests can also make special requests to customize their stay by purchasing specific items to be delivered to their room before arrival. In the end of their stay, guests can also check-out through their own devices and their bill will be automatically sent to their email address rather than stopping at the front desk.

According to Geraldine Calpin, Senior Vice President and Global Head of Digital at Hilton Worldwide, in order to understand what guests really want feedback from more than 40 million HHonors members, as well as the data from guest surveys, social media and review sites was analyzed. The result was clear that guests want greater choice and control of their hotel stay. 84% of business travelers surveyed in a recent Hilton survey<sup>7</sup> from the U.S. said they wanted the ability to choose their exact room. A few months after the launch of the room selection feature, Hilton did a follow-up study to get feedback from guests. One-third of eligible guests had already used the function and

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<sup>5</sup> <http://news.marriott.com/2014/08/4000-reasons-why-travelers-will-love-their-mobile-devices-even-more-this-year-marriott-expands-mobil.html>

<sup>6</sup> <http://news.hiltonworldwide.com/index.cfm/newsroom/detail/27951>

<sup>7</sup> <http://news.hiltonworldwide.com/index.cfm/newsroom/detail/27192>

more than 90% were "satisfied" or "extremely satisfied" with the experience and said they would use it again.

Despite this pioneering innovation, Hilton is currently trying to improve the process because for now, guests still need to waste time stopping in the hotel lobby to pick up the key. In order to simplify the process a hotel key of the future needs to be designed, allowing guests to unlock their hotel room doors using a mobile-enabled room key. Hilton expects to have this new technology available in some U.S. hotels starting in late spring of 2015 with a high adoption from guests given what they have seen with room selection. They are revolutionizing the hotel guest experience with digital tools desired by guests<sup>8</sup>.

#### **2.8.4. Hotel room key of the future - mobile application**

According to Tim Shea, the key to the future hotel guestroom is already in guests' pockets. Plastic keycards will soon be replaced by Smartphones and other mobile devices. This is a result of advanced wireless communication protocols, namely Near Field Communication (NFC), which will be a game-changer for the check-in and check-out processes in hotels. NFC is a feature of mobile devices that allows users to send and receive data securely and instantly over short distances through digital access signals (Shea, 2013).

With this operational strategy guests can go straight to their rooms without having to stop in the lobby reducing the waiting lines at the front desk, assuming that guests check-in digitally. Guests just need to have their Internet-enabled Smartphone with the application that activates a signal to unlock the door by simply holding their device near the NFC-compatible signal reader. It is a functional solution but also has some disadvantages. Though it continues to increase, even in Smartphone-friendly countries the penetration is around 50%. Battery life poses another problem. If the phone runs out of battery this solution cannot be utilized causing even those hotels that want to provide non-stop check-in to maintain the traditional check-in or kiosks (Gruen, 2013). Hotel companies assert that mobile check-in is not designed to cut jobs, but rather a technological initiative aimed at innovating and improving the guest experience, avoiding frustrating check-in lines (CBCNews, 2014). Nevertheless, this solution allows

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<sup>8</sup> <http://www.hiltonworldwideglobalmediacenter.com/index.cfm/newsroom/detail/27701>

hotels to reallocate employee resources to different areas to provide better customer service (Shea, 2013).

One premiere example is The Starwood Hotels & Resorts Worldwide<sup>9</sup>, which in November 2014 was the first chain to introduce a keyless entry system allowing guests to unlock doors with their Smartphone using the Starwood Preferred Guest (SPG). It uses a Bluetooth data connection that communicates with a smart lock on the room's door. Guests just have to open the application, hold the Smartphone to the door lock and wait for the green light to enter the room. According to Mark Vondrasek, head of the loyalty program and digital initiatives for Starwood, guests want this innovation because it simplifies their lives, saving time. With the application, SPG members can book rooms, check-in, get the room number and go directly to their room, use their Smartphone as a key and skip the check-out, thereby bypassing the front desk completely. In the end, their bill will be automatically sent to their email address (Mangla, 2014).

One digital customer experience agency did a survey in 2013, with a sample of 1,000 travelers across the U.S. segmented as Business travelers, Leisure travelers and Family travelers. This study found that 74% of guests indicated that they wanted substantial digital involvement with hotels to improve their experience, particularly business travelers at 79%. In regarding to the check-in process, 73% of travelers said they would be likely to use mobile technology for automated check-in to bypass the front desk. When asked about the innovation Smartphone as a room key, 64% of travelers said they wanted to use it (Magnani Caruso Dutton ,2013).

### **2.8.5. Devices that controls guestroom experience - trends in 2015**

As hotels start to understand, standard amenities such as restaurants, spa and high-speed Internet are considered to be essentials, rather than luxuries and are no longer enough for creating a unique and memorable experience (Bartelds, 2014). According to a study there is a new tendency in tourism called "the always connected traveler". The growing number of people who use mobile devices such as tablets and smartphones has motivated hotel managers to find new ways of interacting with guests (Amadeus, 2011). Therefore, for hotels to become truly differentiated as ones with exceptional service

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<sup>9</sup> <https://starwood.q4web.com/investor-relations/news/news-release-details/2014/Room-Key-20--Key-Card-Optional/default.aspx>

they can use devices in a different way. A new guestroom TV (interactive TV) is much more than a way to simply watch television; it is a device with a lot of functions and applications. Aside from entertainment it can transform the way hotels communicate with their guests and can also personalize the experience (Bartelds, 2014). With this new TV system, upon entering the room, guests can see a personalized welcome message on the screen with the best suggestions. Hotels can begin anticipating every need with some suggestions on TV screen based on the information that hotels have in their Customer Relationship Management (CRM) system about each guest, such as personal preferences, the purpose of travel and services normally requested (Hopkins, 2014). For example, an offer to reserve a meeting room or a favorite drink may appear. It is also possible to transform the television into a digital concierge where guests and hotel staff can communicate directly providing superior and customized service for every guest (Bartelds, 2014). With this system guests can watch their favorite movie or show when it is most convenient for them. Some of the services they can access through the TV include viewing restaurant menus and wine lists in real time and booking a table, looking up directions, booking a massage, booking airport transfers and taxi services, ordering room service, booking an excursion or check-out<sup>10</sup>. The TV can also provide Wi-Fi, transforming it into a full-service computer (Bartelds, 2014). This new all-in-one entertainment system has another feature: room control. With one remote, guests can control drapes, lights, temperature, TV, music, as well as schedule wake-up calls (Control4, n.d.). Hotel guests can control everything in a guestroom, but all these functions and applications are also possible for tablets, iPads and Smartphones<sup>11</sup>.

In 2011, the Four Seasons Hotel Los Angeles at Beverly Hills was the first hotel in the world to launch the innovative Intelity's Interactive Customer Experience™ (ICE) technology with iPad2 devices in all 285 guestrooms, and front desks. They were extremely successful in that a lot of guests started using the new technology and the hotel has had a large amount of requests coming from iPads. Therefore, with ICE technology this hotel increased customer experience, revenues and efficiency which gave them a competitive advantage (Eftekari, 2014). In fact, this new system used in different devices gives guests' all the key hotel information. Additionally, it is a powerful up selling tool because " hotels that currently have a custom application have

<sup>10</sup> <http://eroom.sc/index.html#features>

<sup>11</sup> <http://intelitycorp.com/main/products/>

reported a 41% increase in room service revenue per occupied room. This is largely due to the fact that hotels can use an application to make suggestions after a guest selects a menu option"<sup>12</sup>. A recent study of 53 hotels across the U.S. found that 82% of guests' who had an in-room tablet used them 11 times per day on average, 41% of them to order in-room food, 21% to request a wake-up call and 7% to call for a housekeeper (Los Angeles Times, 2012). An increasing number of guests already mentioned that they prefer to place an order and ask for information via mobile devices rather than calling the front desk or meeting with the concierge (Eftekari, 2014). In-room tablet vendors reported that the use of in-room tablets has increased hotel revenues. By offering interactive guest service the requests are directly introduced into the system which reduces the number of human errors<sup>13</sup>. For instance, one five star hotel experienced an increase of 13% in revenue from the room service department by allowing guests' to order using tablets instead of the hotel phone (Horner, 2012).

According to the General Manager of Four Seasons Hotel Los Angeles at Beverly Hills this system increased guest experience by providing exceptional service with the latest technology by being always connected with the digital world. (Eftekari, 2014). According to another study, the tablet usage is growing in the hotel industry and until 2016 one in three hotels plan to offer in-room tablet devices<sup>14</sup>.

Most hotel industry providers agree that the "biggest advantage of in-room control systems is not what the guests' experience within the room, but also the overall efficiencies and reporting that they can provide on the back-end. The increased operational efficiencies, the economic savings and management reporting features make the implementation of in-room control systems a win-win situation for not only the guests but hotels as well" (Rock, 2008).

#### **2.8.6. Guestroom of the future (3120) - Novotel**

In November 2011, Novotel Paris Vaugirard Montparnasse opened a pilot room over the course of three months (November 2011-February 2012), named Room 3120 with the latest technology and innovative design. This revolutionary room was created in a partnership between Novotel and Microsoft that began in 2008 when Novotel started

<sup>12</sup> [https://blogs.oracle.com/hospitality/entry/in\\_room\\_tablet\\_experience\\_why](https://blogs.oracle.com/hospitality/entry/in_room_tablet_experience_why)

<sup>13</sup> <http://eroom.sc/learn.html>

<sup>14</sup> <http://intelitycorp.com/main/travelers-hoteliers-and-ice-technology-infographic/>

offering Xbox 360 consoles in the public areas of its hotels. This new-generation room allows guests' to have a new experience in a creative universe with features including: a Xbox 360 consoling with a kinect sensor that uses body gestures and voice recognition to control games and entertainment, an interactive sensorit mirror that looks like a magic wall and is also based on Kinect technology for Windows. It displays a variety of information, provides access to news, local weather or a wide range of multimedia content such as radio stations and high-definition movies. It also has a fitness application with games. In addition, this room offers a surface multimedia table, a table featuring a 30-inch tactile screen with a large number of applications like web browsing and board games for several users simultaneously<sup>15</sup>.

Guest feedback was used to introduce new features for rooms across the group. Therefore, Novotel decided to do a pilot phase where the Xbox 360 was tested as in-room entertainment in six of its European hotels, especially in the executive and family rooms. With this technology guests have access to a DVD player that is part of the console, exclusive multimedia content and a selection of video games and films available at the reception and offered to the customer on arrival. This new concept was a success, as proved by the high satisfaction rate expressed by guests (81%)<sup>16</sup>. Despite the good results, the Xbox 360 consoles are only available in the public areas of 325 hotels around the world and 155 hotels also offer a complimentary kinect entertainment experience<sup>17</sup>.

In June 2013 Novotel launched the Virtual Concierge, an innovative digital service that gives to guests all the information about the brand. It also provides access to several services such as recommended restaurants, cultural activities near the hotel, practical weather information, flight schedules and a host of other innovative services including sending virtual post cards. After one month of use the guest feedback was already positive. Novotel had significant increases in guests' satisfaction levels and reported

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<sup>15</sup>[http://www.accorhotels-group.com/fileadmin/user\\_upload/Contenus\\_Accor/Presse/Pressreleases/2011/EN/141111\\_PR\\_Novotel\\_Mino\\_Room\\_en.pdf](http://www.accorhotels-group.com/fileadmin/user_upload/Contenus_Accor/Presse/Pressreleases/2011/EN/141111_PR_Novotel_Mino_Room_en.pdf)

<sup>16</sup> <http://www.accorhotels-group.com/en/news/novotel-includes-the-xbox-360-experience-in-its-hotel-rooms.html>

<sup>17</sup>[http://www.accorhotels-group.com/fileadmin/user\\_upload/Contenus\\_Accor/Presse/20140623\\_cp\\_novotel\\_technology\\_en.pdf](http://www.accorhotels-group.com/fileadmin/user_upload/Contenus_Accor/Presse/20140623_cp_novotel_technology_en.pdf)

high levels of adoption across all target demographics<sup>18</sup>. This service has been a success and it is used by guests to find activities near the hotel (36%), to calculate itineraries (20%) or consult the weather forecast (17%). This service has been progressively implemented in 100 hotels and is now available in more than 250 Novotel establishments around the world, including the Novotel Lisbon. Novotel's Virtual Concierge is also available as a Smartphone application<sup>19</sup>. By the end of June 2014 Novotel's Web 3.0 hotel experience included the latest innovative technology, the PLAY multimedia table that has been tested in 12 pilot lobbies worldwide. It is a multi-tactile entertainment service equipped with a wide range of educational games for kids and adults<sup>20</sup>. In order to synthesize all the technological trends that have been referred before the Table 2 is displayed.

**Table 2. Synthesis of technology trends and their features**

Technology	Features
Self-service check-in and check-out kiosks.	Very usable touch-screen, that allow guests to check-in and go directly to their room, without waiting in the front desk. It also allows guest to check-out.
Application (mobile phone, computer or tablet) for check in and check-out.	Possibility to check-in on the day before their arrival, they can choose the room number and can also make special requests to customize their stay. However, they have to pick the key card in a specific mobile check-in desk. They can check-out through their own devices and their bill will be automatically sent to their email address rather than stopping at the front desk.
Guest Room Lock Access via guest's mobile phone	Guests can go straight to their rooms without having to stop in the front desk, assuming that guests check-in digitally.
In-room Interactive TV	Internet access, control of the room (control heating systems, air conditioning, lighting, music, TV and control the curtains), order room service, make reservations, a digital concierge with a personalized service, check-out, etc.
Tablet or iPad	Internet access, games and applications that allow guests to take control of the room (control heating systems, air conditioning, lighting, music, TV and control the curtains) to make restaurant reservations, order room service and order airline tickets.

<sup>18</sup> [http://www.accorhotels-group.com/fileadmin/user\\_upload/Contenus\\_Accor/Presse/Pressreleases/2013/EN/monscierge\\_novotel\\_release\\_for\\_hitec\\_rf\\_en.pdf](http://www.accorhotels-group.com/fileadmin/user_upload/Contenus_Accor/Presse/Pressreleases/2013/EN/monscierge_novotel_release_for_hitec_rf_en.pdf)

<sup>19</sup> idem 15

<sup>20</sup> idem 15

Technology	Features
Free High Speed Internet Access	Internet Access with high speed for free in-room and in the public areas.
Xbox 360 Consoling	Kinect sensor that uses body gestures and voice recognition to control games and entertainment.
Virtual concierge	Touch screen with all the information about the city: restaurant tips, flight arrivals and departures and driving directions via these devices to guests.
In-room interactive table	Touch screen with internet games and various multimedia applications.
In-room Interactive mirror/wall	A host of applications (to go to internet, to see movies, to personalize room with photos, etc.)

Source: Bartelds, (2014); Control4; Gruen, (2013); Mangla, (2014); Weed, (2013); <sup>21</sup>, <sup>22</sup> and <sup>23</sup>.

With all the latest technologies recently tested and implemented in hotels worldwide, it is important to understand if customers of Portuguese upscale hotels need and want these new technologies. Therefore it is important to know what the impact of the latest technological amenities is on customer experience in upscale hotels, which one's the guests really want to have available and the ones that can enhance their experience. This is another of the purposes of this study.

## 2.9. Importance- Performance (Satisfaction) Model

The Importance-Performance model is an important tool used by managers to develop a strategic plan for the company, to help researchers to identify improvement opportunities and to evaluate a firm's competitive position in the market (Martilla & James, 1977; Hawes & Rao, 1985; Myers, 2001). It is a simple matrix, created by Martilla and James (1977) to identify which product or service attributes a company should focus on in order to enhance customer satisfaction (Matzler, Bailom, Hinterhuber, Renzl, & Pichler, 2004). The Importance-Performance Analysis (IPA) is also known as the Importance - Satisfaction (IS) model since satisfaction is considered to be a main measure of service quality (Tonge & Moore, 2007; Aktas, Aksu & Çizel 2007; Matzler, Sauerwein & Heischmidt, 2003). With this tool it is possible to analyze two dimensions of customer attributes: importance and satisfaction (performance). It

<sup>21</sup> <http://www.hiltonworldwideglobalmediacenter.com/index.cfm/newsroom/detail/27701>

<sup>22</sup> <https://starwood.q4web.com/investor-relations/news/news-release-details/2014/Room-Key-20--Key-Card-Optional/default.aspx>

<sup>23</sup> <http://www.accorhotels-group.com>



forms a two-dimensional matrix making it very easy to analyze, extract suggestions and understand the results. According to Hansen and Bush (1999) the interpretation of this matrix is very simple: the means of importance-satisfaction (performance) divide the matrix into four quadrants (Fig. 2).

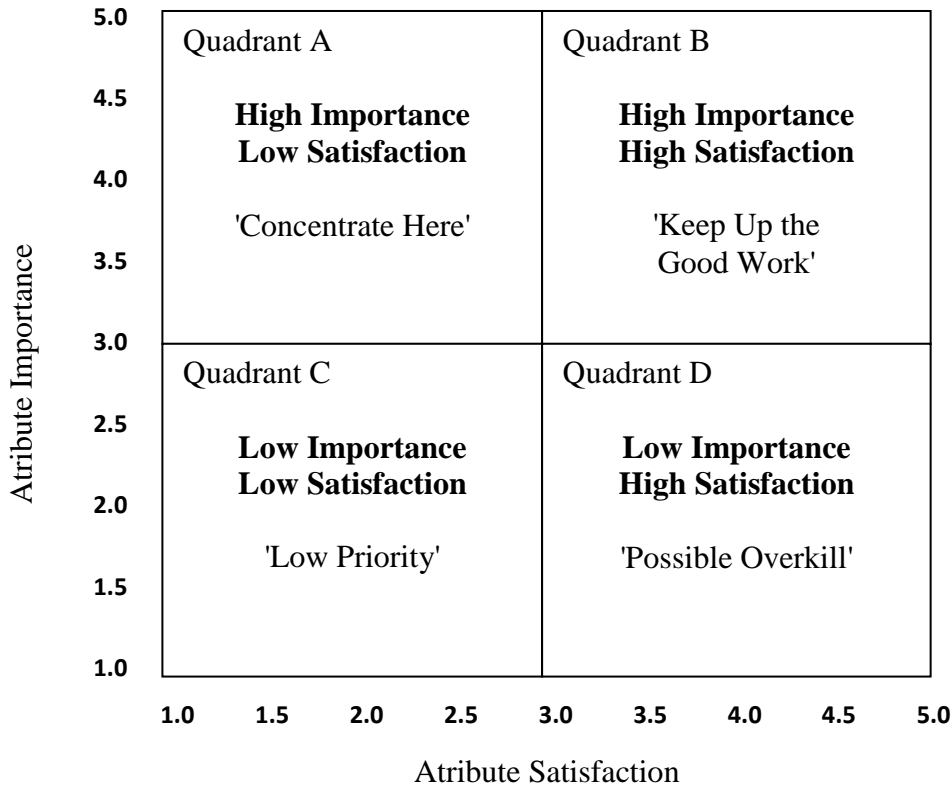


Figure 2. Importance - Satisfaction Matrix

Source: Adapted from Matzler, Sauerwein & Heischmidt, 2003, p.115

The first quadrant (A) includes the attributes that are perceived by customers as very important, but with a low satisfaction level. Therefore, it is the area with highest priority and the improvement efforts should be "concentrated here". The second quadrant (B) captures the attributes that are very important to customers and at the same time the ones that display a high customer satisfaction level ("Keep up the good work"). Quadrant 3 (C) is called "lower priority" because the attributes in this area are rated as having low importance and low satisfaction. In the case where the attributes are not perceived to be very important limited resources should be expended. Quadrant 4 (D) includes attributes of low importance, but with high levels of satisfaction. Although customers are satisfied with those attributes they are not very important for them, therefore managers should consider present efforts in this area as superfluous.

## Chapter 3 - Methodology

### 3.1. Research context

In comparison with 2013, the hotel industry in Portugal grew the number of overnight stays by 11% in 2014. In total, 46.1 million overnight stays were recorded. The Portuguese hotel industry closed 2014 with an increase of 12% in revenues to €2.2 billion. The Alentejo (+ 17.2%), Lisbon (+ 15%) and Algarve (11.2%) regions grew the most last year<sup>24</sup>.

Portuguese hotels are facing an extremely competitive market in relation to the number of hotels and quality of service delivered to guests. By analyzing the number of hotel units in Portugal it is clear that there has been an increase over the years. In 2009 there were 681 hotels and in the last year it has almost doubled to 1,121, as shown in Table 3. In regards to the number of upscale hotels (4 and 5 stars) in Portugal targeted for this study, there were 96 five star hotels and 352 four star hotels in 2014. Therefore, five star hotels represent about 9% of the total in Portugal while four star hotels represent almost 32% of them.

**Table 3. Number of hotels in Portugal by Type**

Type	2009	2010	2011	2012	2013	Number 2014
<b>Hotels</b>	681	771	873	988	1.039	1,121
<b>5*</b>	56	64	73	74	90	96
<b>4*</b>	242	267	294	317	327	352
<b>3*</b>	272	292	306	331	339	356
<b>2* and 1*</b>	111	148	200	266	283	317
<b>Apartments</b>	128	137	144	150	145	146
<b>Hostels</b>	41	40	39	36	35	35
<b>Touristic Resort</b>	33	38	40	45	44	46
<b>Touristic Apartments</b>	184	183	184	195	192	196
<b>Other</b>	921	842	739	614	553	504
<b>Total</b>	<b>1,988</b>	<b>2,011</b>	<b>2,019</b>	<b>2,028</b>	<b>2,008</b>	<b>2,048</b>

Source: INE - Instituto Nacional de Estatística (2014 - provisional values (14/08/2014))<sup>25</sup>

<sup>24</sup>[http://www.jornaldenegocios.pt/economia/conjuntura/detalhe/hotelaria\\_portuguesa\\_fechou\\_2014\\_com\\_mais\\_11\\_de\\_dormidas\\_e\\_subida\\_de\\_12\\_nos\\_proveitos.html](http://www.jornaldenegocios.pt/economia/conjuntura/detalhe/hotelaria_portuguesa_fechou_2014_com_mais_11_de_dormidas_e_subida_de_12_nos_proveitos.html)

<sup>25</sup>[http://www.turismodeportugal.pt/Portugu%C3%AAs/ProTurismo/estat%C3%ADsticas/quadroestatistico\\_s/ofertahoteleira/Documents/Estabelecimentos%202005-2014%20Portugal\\_Tipologias.pdf](http://www.turismodeportugal.pt/Portugu%C3%AAs/ProTurismo/estat%C3%ADsticas/quadroestatistico_s/ofertahoteleira/Documents/Estabelecimentos%202005-2014%20Portugal_Tipologias.pdf)

By disaggregating global revenues that were recorded in 2014 by type and category of hotels the results showed that 73% of global value was generated by hotels (1.6 billion €) and that 79% of this amount (1.3 billion) was from 4 and 5 star hotels (see Table 4).

**Table 4. Total revenues in 2014 by type**

<b>Total revenues (10<sup>6</sup>€)</b>	2014	Δ 14/13	Δ 14/13	2014 share
<b>Type</b>	<b>Year</b>	<b>%</b>	<b>Abs</b>	<b>%</b>
<b>Hotels</b>	1,612,3	14.0	198,3	73.1
<b>5*</b>	585,5	14.9	76,1	26.6
<b>4*</b>	689,2	11.8	72,6	31.3
<b>3*</b>	244,1	17.1	35,6	11.1
<b>Apartments</b>	252,6	9.2	21,3	11.5
<b>Hostels</b>	33,9	6.6	2,1	1.5
<b>Touristic Resort</b>	92,5	15.9	12,7	4.2
<b>Touristic Apartments</b>	114,1	15.3	15,2	5.2
<b>Other</b>	98,9	0,0	0,0	4.5
<b>Total</b>	<b>2,204,1</b>	<b>12.8</b>	<b>249,6</b>	<b>100</b>

Source: INE - Instituto Nacional de Estatística (2014 - provisional values)<sup>26</sup>.

In terms of hotel awards, Portugal continues to have a strong presence amongst the competition. "Portugal was honored with 16 awards by the prestigious 2014 World Travel Awards Europe at the 'Oscars' of the world tourism industry. The hotels awards are the following: Conrad Algarve (Best Luxury Resort), Bairro Alto Hotel (Best Historic Heritage Hotel), Choupana Hills (Best Boutique Resort), Vila Joya (Best Boutique Hotel), The Vine (Best Design Hotel), Pestana Porto Santo (Best All-Inclusive Resort), Pine Cliffs (Best Hotel Residences) and Martinhal Resort (Best Villa Resort). The "Most Romantic Resort in Europe" award was given to the Vila Vita Parc. In sub-regional categories two additional Portuguese hotels were distinguished: The Quinta da Casa Branca (Boutique Hotel) and Penha Longa (Spa Resort). Other top winners included the Terra Nostra Garden Hotel (Sao Miguel, Azores), Sheraton (Algarve), the Pousada de Cascais (Cascais/Estoril), the Hotel Quinta do Lago and Vilalara (Algarve)"<sup>27</sup>.

<sup>26</sup>

[http://www.turismodeportugal.pt/Portugu%C3%AAs/ProTurismo/estat%C3%ADsticas/quadroestatisticos/ofertahoteleira/Documents/Estabelecimentos%202005-2014%20Portugal\\_Tipologias.pdf](http://www.turismodeportugal.pt/Portugu%C3%AAs/ProTurismo/estat%C3%ADsticas/quadroestatisticos/ofertahoteleira/Documents/Estabelecimentos%202005-2014%20Portugal_Tipologias.pdf)

<sup>27</sup> <http://portuguese-american-journal.com/portugal-wins-16-top-honors-at-the-2014-world-travel-awards-europe-athens-greece/>

On the list of the '25 best hotels in Portugal' according to 2014 TripAdvisor Traveler's Choice Awards, Madeira lead with eight units. Lisbon followed closely with six, the Algarve with five, Cascais had three and Gaia, Vidago and Paço d'Arcos, each had one award<sup>28</sup>.

Customers voted that the best Portuguese hotel in 2014 was The Cliff Bay in Madeira, while the Most Popular hotel was Lisbon's Turin Avenida Da Liberdade and the hotel with Best Content was the Altis Belém<sup>29</sup>. The Conrad Algarve was voted the Best Five Star Hotel in Portugal in the Publituris Travel Awards 2014. This luxury resort already received 16 internationally renowned awards, including the World's Best Luxury Resort in 2013 and Best Luxury Resort in Europe in 2014 by the prestigious World Travel Awards<sup>30</sup>.

### 3.2. Research questions

This study focuses on identifying what the most important technologies are for hotel guests and which latest technologies have the potential to enhance customer experience. The goal is to analyze if technologies have an impact on customer experience and understand how hotels can enhance their experience with new technology. A review of the literature has shown some differences regarding the most important technologies for guests, as well as some differences across their purpose of travel and age. Consequently the research questions are:

- 1) What is the impact of current technological amenities on customer experience in upscale hotels?
  - 1.1) Which technological amenities are more or less important for hotel guests?
  - 1.2) Are guests satisfied with the available technologies in Portuguese upscale hotels?
  - 1.3) Do guests want new technologies to have a better experience?
- 2) What is the potential impact of the latest technological amenities on customer experience in upscale hotels?
  - 2.1) Which of the latest technological trends do guests believe will create a better guest experience?

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<sup>28</sup> <http://pressroom.visitportugal.com/en/2014/01/portuguesehotelstravelerschoiceawards2014/>

<sup>29</sup> [http://www.dn.pt/inicio/economia/interior.aspx?content\\_id=4408973&seccao=Dinheiro%20Vivo](http://www.dn.pt/inicio/economia/interior.aspx?content_id=4408973&seccao=Dinheiro%20Vivo)

<sup>30</sup> <http://www.bpcc.pt/spotlight-arch/112-conrad-algarve-eleito-melhor-hotel-de-cinco-estrelas-em-portugal.html>

- 3) Which of the latest technologies do customers prefer for check-in, check-out, room control, and to reserve a service?
- 4) Are there differences in guests' technological amenity preferences across purpose of travel and age?
- 5) Does the availability of new guestroom technology impact guests' decision in choosing a hotel?
- 6) Are guests' willing to pay extra for a guestroom which has the latest technologies?
- 7) Are guests looking for a new experience?

### **3.3. Data Collection Methods**

In order to achieve better results and following the recommendations of previous studies, both qualitative and quantitative data will be collected. First, an analysis of website content will be made in order to know which technological amenities are present in the upscale hotels in Portugal. Other research about the latest and future technology for hotels is carried out prior to designing the guest questionnaires as well as the interview guide for hotel managers.

#### **3.3.1. Qualitative research**

Qualitative research will be conducted to gain an understanding of the current technological amenities in upscale hotels as well as the future trends and the managers' perception of the importance of technologies for hotel guests. This study will explore the upscale hotels (4 and 5 stars) because they already have sophisticated technology and also because the owners of these hotels are looking for new technology so as to be competitive in this ever-changing world. To obtain this information an analysis of website content and two interviews with hotel managers of upscale hotels in Portugal will be made. The interview is mostly open-ended questions but also contains some closed-ended questions.

##### ***3.3.1.1. Content Analysis of hotels' website - observation of technologies***

According to a study from Deloitte (2014), the national ranking of hotel chains based on the number of accommodation units (number of rooms/apartments) is as follows: 1st Pestana, 2nd Vila Galé, 3rd Accor and 4th Tivoli. In order to get a better understanding of the present technological amenities available in Portuguese upscale hotels, an

analysis of upscale hotel websites was made. Since these four hotel groups are classified as those with the greatest number of available rooms in Portugal, the websites of five hotels in each group were analyzed (June, 2014). The choice of hotels was made based on its category, giving preference to five stars hotels in each group. Within the same category the choice was made randomly.

After all of technologies present in the websites of the twenty-five selected hotels (appendix III-1) were identified the following list with nineteen technologies was established, as shown in Table 5.

**Table 5. Technological amenities in Portuguese upscale hotel websites**

Technological amenities	Pestana	Tivoli	Vila Galé	Accor
Air conditioning	x	x	x	x
Internet access in the rooms	x	x	x	x
Mini Bar	x	x	x	x
Hairdryer	x	x	x	x
Telephone	x	x	x	x
Cable/Satellite Channels	x	x	x	x
Voice Mail	x	x		x
Business Center (computers with Internet access)	x	x	x	x
Internet access in public areas	x	x	x	x
LCD Television	x	x	x	x
Safe	x	x	x	x
TV-Speakers/Music in WC		x		x
Mirror with built-in television in the bathroom		x		
Facilities to make Coffee/tea	x	x	x	x
iHome: iPod hub & radio	-/x	x	-/x	-/x
CD/DVD Player	x*	x*		x*
Video gaming on demand	x	x	x	x
Movie on demand	x	x	x	x
Alarm clock	x	x	x	x

**Legend:** -/x: means that the hotel does not have an iPod hub, but has a radio; x: means that the technology is present in at least in one of the five hotels analyzed in the respective group; x\*: not in the majority of the rooms, only in suites or in the main building

By observing Table 5 it is simple to see the available technologies in these hotel chains. While there are similarities among them, Tivoli is the group that stands out for having some of the most innovative in-room technologies such as: iHome: iPod hub & Radio and a mirror with built-in television in the bathroom.

### *3.3.1.2. In-depth interview*

The outline of the interviews (appendix I) was made before the customer questionnaire (appendix II) in order to understand which technology hotels were planning to implement in the future and which recently became mainstream. Thus, these technologies were introduced in the customer survey to obtain guest feedback about them. The other main reason for conducting interviews is, as the previous studies from the literature review suggest, the importance of obtaining the view of both customers and managers in order to provide a more comprehensive understanding of the study (Barker, et al., 2003). Therefore, the interviews aimed to answer the following issues: to better understand the technologies that customers give more value to in a hotel, the impact of them in the customer experience and in the guest satisfaction. One of hotel managers' main goals is to keep their customers satisfied and identifying what generates that satisfaction. They are the persons with better perceptions about their personalities, customs, likes and dislikes.

The interviews were conducted with two hotel managers, the director of Troia Design Hotel, Manuel Duarte, and the National Sales Representative at Novotel Lisboa, Rita Pratas, along with an information technology department representative. The beginning of the interview established that both have similar technology available in their hotels: air conditioning, mini bar, hairdryer, telephone, cable/satellite TV, LCD Television, safe, alarm clock and channels Pay-Per-View in the rooms, business center with computers and Internet, and Internet access in both the rooms and in public areas. Novotel Lisboa also has radio and coffee/tea facilities in the rooms, an Xbox 360 consoling with a kinect sensor and a virtual concierge in the lobby.

The second part of the interview was in relation to the impact of technology on customer experience. Manuel answered that "nowadays technologies are essentials in guest comfort therefore they have a big impact". Rita also shares the same opinion as Manuel saying, "today, to have a hotel without technologies is not productive". Both said that the most important technology for guests is clearly the Wi-Fi. According to Manuel, "technologies can have an impact in the customer's decision when it is making the choice of hotel, but depends on customer motivation. Sometimes some details can make the difference when guests are choosing a hotel". An interesting aspect highlighted by Rita was "the possibility of the hotel to provide to its customers access to technologies that are not implemented in the hotel, there is the possibility of going back

to what the customer wants". She stated that "this possibility has more impact when a guest chooses a hotel than the available technologies".

Although access to the Internet has become a requirement for all customers, Manuel believes that "the demand for technologies continues to change depending on the customer type". Rita stated that "business travelers are more demanding about technologies, mostly in meeting rooms and regarding the speed of Internet." When the managers were asked if their guests were looking for a new experience through new technology, Manuel said "no" and Rita said "yes, some guests are quite demanding", leading her to seek answers that satisfy their needs. Therefore, for her, "the solution is to be versatile and follow what the customer wants". When asked about customer satisfaction with technologies Rita's answer was that they have room to improve. "It is possible to enhance customer satisfaction, the guest could be even more pleased." However from Manuel's perspective their guests are satisfied with the available technologies.

In the third part of the interview, the managers of Troia Desing Hotel and Novotel Lisboa answered some questions regarding the importance of new technology in hotels. One very important issue was to understand what is the main goal with the implementation of new technologies. According to Manuel "the goal is to improve the customer experience and satisfaction." For Rita, it was to "increase customer satisfaction, but also to follow market trends and to reduce costs." Neither hotel managers consider there to be a specific area in the hotel which is a priority for investment in new technologies. However, the meeting rooms, the rooms and the lobby are areas that may have some priority. Manuel said that "it is important to invest in new technologies to offer a better experience to guests". Even though, the Troia Design Hotel has done a considerable number of investments in the technological area, they were done with an IT department that provides maintenance and upgrading of existing technologies, and therefore they are not considered investments to acquire new technologies. On the other hand, Rita stated that they "had made a uniform investment by all brands in the Accor group with the aim of improving the customer experience during their stay as well as their satisfaction". In conclusion, both consider the implemented technologies to have contributed to the success of the hotel. Rita referred that "at least we do not lose customers due to lack of technology".



In the fourth part, Manuel and Rita were asked if they have a team of innovation and development tasked with testing new technologies in pilot rooms to get customer feedback; they both answered "yes".

Concluding the interview, Rita mentioned that, "Novotel Lisboa recently implemented a virtual concierge in the lobby that is a touch screen with all the information about the city, restaurant tips, the weather, places to visit, flight schedules, etc. In 2011 Novotel offered to guests one Xbox 360 consoling with a kinect sensor in the lobby that uses body gestures and voice recognition to control games and entertainment. This technology has been used essentially by kids, but is available for everyone. Regarding the future technologies, Novotel Lisboa is studying a project with video conference".

The Troia Design Hotel had not recently implemented new technologies and Manuel also noted that "there is no technology currently being analyzed for future implementation". The technology mentioned by Rita as the latest and future implementations will be included in the guest questionnaire.

### **3.3.2. Quantitative research**

#### ***3.3.2.1. Questionnaire design***

After a review of the literature and using all the information gathered from website research and interviews with hotel managers the questionnaire for hotel guests was concluded. The questionnaire has two versions, one in English and another in Portuguese. The survey starts with a cover letter explaining the study and is followed with a question that automatically excludes participants who do not belong to the target audience.

The questionnaire is divided into four parts. The first part has five questions centered on demographic characteristics, allowing the respondents to be analyzed in different categories: age, gender, marital status, nationality and current employment status. The second part has eight questions, focused on the last upscale hotel stay of the guest in Portugal. The name of the last upscale hotel, the reason for their choice, the purpose of their travel and with whom they traveled are four of the eight questions of this part. It also asks guests for their opinion regarding the importance and satisfaction with technologies in their last stay. They were asked to rate 19 technologies using a 7 point Likert scale (1= not at all important/not satisfied at all and 7= extremely

important/extremely satisfied). They were instructed to first rate the level of importance that each one has in their stay and then their satisfaction with them. These items were gathered based on the technologies found on the websites, referred to by the hotel managers in the questionnaire and also from the literature review. The list contains the following nineteen technologies (17 in the room and two in the lobby): LCD Television, CD/DVD player, cable/satellite TV, video gaming On Demand, movie On Demand, mini bar, alarm clock, iHome: with iPod hub & radio, air conditioning, wireless Internet, fixed & portable telephones, voicemail, in-room electronic safe, TV-speakers /music in WC, hair dryer, in-Mirror TV in the bathroom, coffee/tea making facilities, Wi-Fi access in public areas and a 24 hour Net center (business center). In the second part, customers are asked about their satisfaction with the available technologies and if they think that available technologies had a positive impact on their experience. In the first question of the third part respondents have to rate the importance of 14 latest and future technological amenities (appendix II) again using a seven point Likert scale. The following four questions refer to the customers' preferences about the available options to check-in, check-out, to control the room and to order room service. The respondents are also asked about the impact of new guestroom technologies in their decision when choosing a hotel and if they are willing to pay extra for it. There was one open question asking if guests would like to have other technologies that were not referred in this questionnaire. The concluding question of this part asks if customers are looking for a new experience. The fourth and last segment has three questions about general customer satisfaction with the technological amenities experienced in all their stays in Portuguese upscale hotels in order to understand if they need new technologies to have a better experience or if the available ones that they found are enough.

This questionnaire was made based on a questionnaires from a similar studies (Bhangu, 2013; Nasoz, 2011).

### ***3.3.2.2. Pre-test and field the work***

Before distributing the questionnaire a pre-test was made on the second week of August in 2014 with a sample of 10 people. The purpose of this was aimed at improving it in the areas of duration, greater clarity and objectivity of the questions, instructions for evaluation and consideration of the overall questionnaire as well as any comments and suggestions that were offered. After the pre-test, some adjustments were made based on

the recommendations of the respondents. The questionnaire distribution was made in person (in the streets, in shopping centers, in travel agencies and in upscale hotels in Portugal). The distribution started on the last week of August of 2014 and finished in the end of March 2015.

### **3.3.2.3. Sample design**

Both leisure and business travelers are respondents for the study. The target population was defined as guests that have already attended one or more upscale hotels (4 and 5 stars) within the immediate past 12 months in Portugal and who were more than 17 years old. After removing the invalid questionnaires and those that contained errors or were incomplete, there were 310 eligible for analysis.

## **3.4. Statistical Methods**

Data analysis was performed on the survey responses and the results were coded and will be analyzed using the Statistical Packages for Social Science version 22 (SPSS). To analyze demographic characteristics, the travel behaviour of guests in their last stay in a Portuguese upscale hotel and some guests' technological preferences frequency tables will be calculated. Descriptive statistics will also be calculated for each of the scale variables. In order to test the significant mean difference (gap) between respondents' perceptions of importance and satisfaction with the 19 technological amenities a paired sample t-statistics test will be conducted. Based on the results, an Importance - Satisfaction matrix will be created to have a better understanding of the importance and the satisfaction level of each technology. To create technological dimensions among the 14 technologies of the future, a factor analysis will be used. To study the differences of guest preferences according to the purpose of travel and age a parametric One-way ANOVA test will be performed. The decision to reject or not reject the null hypothesis ( $H_0$ ) will depend on  $p\text{-value} > \alpha$ , wherein  $\alpha = 0.05$ . If  $p\text{-value} > 0.05$ , the null hypothesis may not be rejected. The Post- Hoc Test will also be used to compare results across each pair of generations. The goal is to identify the different demands that different guests have in order to provide better experience and more personalized service. Finally, a linear regression analysis will be conducted to identify which technological dimensions have a positive impact on guests' willingness to pay extra for a guestroom and on guests' decision in choosing a hotel.

## Chapter 4 – Analysis and discussion of Results

### 4.1. Sample Description

#### 4.1.1. Demographic profile description

The survey was completed by 310 respondents, 50% were male and 50% were female. Categorized by age, 35.8% of respondents were between 26 and 34 years old; 29% were between 18 and 25 and about one quarter (24.2%) ranged between 35 and 54. There were a few respondents aged between 55 and 64 (8.1%) and only 2.9% were older than 65 years old. In regards to respondents' countries of origin, the vast majority of respondents were Portuguese, representing 84.5% of the sample. But there were a total of 22 different nationalities answering the questionnaire, including 16 counties from Europe and also countries like Brazil, U.S.A., Angola, Cape Verde and Morocco. The most representative countries in the sample after Portugal, were Brazil (3.5%), United Kingdom (2.6%) and Belgium (1.6%). In terms of the marital status, almost half of the respondents were single (49.4%) and 43.5% were married or were cohabitating. The remaining part of the sample were divorced or separated (5.8%) and only 1.3% was widowed. By employment status, the majority of respondents were employed (72.3%), while only 1.3% were unemployed and 4.2% retired. The remaining respondents were studying (22.3%). Of those who were studying, only 8.4% were studying and working at the same time. The following table summarizes the demographic characteristics of the sample (Table 6).

**Table 6. Sample profile**

Variable	Category	N	%
Age group	18-25	90	29.0%
	<b>26-34</b>	<b>111</b>	<b>35.8%</b>
	35-54	75	24.2%
	55-64	25	8.1%
	65 or over	9	2.9%
Nationality	<b>Portuguese</b>	<b>262</b>	<b>84.5%</b>
	Foreign	48	15.5%
Gender	Male	155	50.0%
	Female	155	50.0%
Marital Status	<b>Single</b>	<b>153</b>	<b>49.4%</b>
	Married/ cohabitating	135	43.5%
	Divorced/ Separated	18	5.8%
	Widowed	4	1.3%
	<b>Employed</b>	<b>224</b>	<b>72.3%</b>
Employment situation	Unemployed	4	1.3%
	Studying	43	13.9%
	Retired	13	4.2%
	Studying and working	26	8.4%

#### 4.1.2. Details of the last stay in a Portuguese upscale hotel

In regards to the last stay in Portugal the respondents referred to a wide variety of upscale hotels from north to south, and in Madeira and Azores. However, some hotel groups stood out for their presence in the sample. The six most representative hotel groups are Sana (7.7%), Vila Galé (5.8%), Accor (5.5%), Pestana (5.2%), Nau hotels & resorts (3.9%) and Tivoli (3.9%). Together these six hotel groups represent 31.9% of the sample. According to a study from Deloitte (2014), those hotel groups are the same top six with the highest number of accommodation units (number of rooms/apartments), which can explain their considerable presence in the sample.

The hotel choice can be explained by several factors. The majority of respondents stated that the location is one of the reasons (56.5%); 43.5% referred the price/quality ratio, and 26.5% referred the services and facilities. 25.2% of respondents considered recommendations to be a factor when they are selecting a hotel. Other reasons are websites reviews (8.7%), work events (6.1%), technological amenities (5.8%), discount vouchers (3.9%) and golf (0.6%).

When examining the purpose of the last stay, a vast majority of respondents (67.1%) were leisure guests, while just 20.3% were traveling on business or work. A small portion of the sample (10%) were traveling for more than one reason, stating that the purpose of their last trip was business but also leisure. Almost 40% of the travelers said they traveled as a couple (37.4%), 26.5% went with family and 17.4% with friends. The remaining part of the sample was traveling alone (12.9%) and only 5.8% traveled with coworkers. All these details are summarized in Table 7.

**Table 7. Details of the last stay in a Portuguese Upscale Hotel**

Questions		N	%
Hotel groups/hotels	Sana	24	7.7%
	Vila galé	18	5.8%
	Accor	17	5.5%
	Pestana	16	5.2%
	Nau hotels & resorts	12	3.9%
	Tivoli	12	3.9%
	Other	211	68.1%
Why did you choose this hotel?	Location	175	56.5%
	Price/Quality	135	43.5%
	Services and facilities	82	26.5%
	Recommendations	78	25.2%
	Technological amenities (ex: wi-fi)	18	5.8%
	Websites reviews	27	8.7%
	Chosen by the company - work	19	6.1%
	Discount vouchers	12	3.9%
	Golf	2	0.6%
	Other	12	3.9%
Purpose of travel	Leisure	208	67.1%
	Business/ Work	63	20.3%
	Leisure and Business	31	10.0%
	Other	8	2.6%
Did you travel:	Alone	40	12.9%
	With friends	54	17.4%
	As a couple	116	37.4%
	With family	82	26.5%
	With coworkers	18	5.8%

Another finding of this study indicates that almost 90% of respondents that came alone were business travelers (87.5%) while the majority of guests that traveled with family (91.5%), as a couple (83.6%) and with friends (62.3%) were leisure guests (see appendix III - 2).

## 4.2. Importance - Satisfaction Analysis

### 4.2.1. Descriptive statistics - Importance

In order to understand which technologies are more and less important for respondents, descriptive statistics for 19 current technological amenities are used. Table 8 highlights the means and standard deviations for the 5 technologies with higher and lower levels of importance as reported by respondents.

**Table 8. Descriptive Statistics - Importance**

<b>Please rate the technologies below according to an importance scale from 1 to 7.</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Wireless Internet (in-room)	310	6.58	0.944
Air Conditioning	310	6.44	1.022
Wi-Fi access in public areas	310	6.38	1.131
Cable/satellite Channels	310	5.31	1.574
LCD Television	310	5.24	1.533
Hair dryer	310	5.23	1.87
Net center 24 hours	310	5.00	1.901
Coffee/Tea making facilities	310	4.75	1.878
In-Room Electronic Safe	310	4.71	1.953
Mini Bar	310	4.19	1.848
Fixed &portable telephones	310	3.89	2.014
TV-Speakers /Music in WC	310	3.73	2.06
iHome: with iPod hub & radio	310	3.43	2.054
Alarm Clock	310	3.18	2.015
Movie on demand	310	2.83	1.841
in-Mirror TV in the bathroom	310	2.79	1.922
Voicemail	310	2.66	1.799
CD/DVD Player	310	2.63	1.649
Video gaming On Demand	310	1.96	1.455

The five highest rated technologies were: in-room wireless Internet, air conditioning, Wi-Fi access in public areas, cable/satellite channels and LCD Television. On the other hand, respondents considered movie On Demand, in-mirror TV in the bathroom, voicemail, CD/DVD player and video gaming On Demand as the five least important technologies to have a good experience.

#### 4.2.2. Descriptive statistics - Satisfaction

Survey participants were asked to rate their satisfaction with 19 technologies in the last Portuguese upscale hotel they stayed in over the preceding 12 months.

Additionally, for this question respondents had the option "never used" and "not available" if they did not have experience with the technology in the last hotel they stayed in. Respondents that selected these two options were eliminated from the data analysis as shown in column N (number in a sample) of Table 7.

The conclusion made using descriptive statistics to examine the level of guest satisfaction with the 19 technologies was that the five technologies with higher and lower levels of guest satisfaction were the same as those in the previous analysis about the importance of the technological amenities. However, the order is different, as shown in Table 9 .

**Table 9. Descriptive statistics - Satisfaction**

<b>Please rate the technologies below according to your satisfaction with them in your last upscale hotel stay in Portugal.</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Air Conditioning	289	6.34	1.072
LCD Television	288	5.99	1.338
Wireless Internet	285	5.85	1.420
Wi-Fi access in public areas	254	5.83	1.472
Cable/satellite Channels	274	5.80	1.342
Coffee/Tea making facilities	154	5.78	1.569
In-Room Electronic Safe	155	5.67	1.714
Mini Bar	194	5.62	1.533
Net center 24 hours	130	5.55	1.761
Hair dryer	238	5.53	1.627
Fixed & portable telephones	141	5.40	1.703
TV-Speakers /Music in WC	115	5.23	2.086
Alarm Clock	109	5.19	1.878
iHome: with iPod hub & radio	82	5.05	2.113
CD/DVD Player	78	4.77	2.125
Voicemail	75	4.67	2.101
Movie On Demand	80	4.60	2.214
in-Mirror TV in the bathroom	60	4.48	2.446
Video gaming On Demand	55	3.93	2.168



### 4.2.3. Importance-satisfaction gap analysis

Survey participants were asked to rate the importance of 19 technologies and their satisfaction with them in the last hotel stay. In order to test the significant mean difference (gap) between respondents' perceptions of importance and satisfaction with the 19 technological amenities a paired t test was used. The results are present in Table 10.

**Table 10. Cross-checking - T-test (Importance - Satisfaction)**

Technology	N	Importance	Satisfaction	Correlation	t	Sig. (2-tailed)
1.LCD Television	288	5.32	5.99	0.317	-6.843	0.000*
2. CD/DVD Player	78	3.42	4.77	0.413	-5.326	0.000*
3. Cable/Satellite Channels	274	5.50	5.80	0.221	-2.856	0.005*
4. Video gaming On Demand	55	2.56	3.93	0.103	-3.957	0.000*
5. Movie on demand	80	3.69	4.60	0.428	-3.625	0.001*
6. Mini bar	194	4.75	5.62	0.313	-6.462	0.000*
7. Alarm clock	109	3.94	5.19	0.423	-5.993	0.000*
8. iHome: with iPod & radio	82	4.32	5.05	0.264	-2.566	0.012*
9. Air Conditioning	289	6.48	6.34	0.275	1.911	0.057
10. Wireless Internet	285	6.64	5.85	0.042	8.357	0.000*
11. Fixed & portable telephones	141	4.57	5.40	0.314	-4.675	0.000*
12. Voicemail	75	3.49	4.67	0.286	-4.117	0.000*
13. In-room electronic safe	155	5.37	5.67	0.422	-2.058	0.041*
14. TV-Speakers/Music in WC	115	4.31	5.23	0.336	-4.142	0.000*
15. Hair dryer	238	5.66	5.53	0.256	0.985	0.326
16. In-room TV on WC	60	3.95	4.48	0.466	-1.709	0.093
17. Coffee/Tea making facilities	154	5.30	5.78	0.285	-3.062	0.003*
18. Wi-Fi access in public areas	254	6.48	5.83	0.080	6.046	0.000*
19. 24 hour Net center	130	5.61	5.55	0.181	0.321	0.749

\* statistically significant for  $\alpha = 0.05$

The t-statistics present in Table 10 indicate that the difference between the respondents' importance and satisfaction was significant for the majority of the attributes. The satisfaction score was significantly higher than the importance score for respondents in the following: LCD television, CD/DVD player, cable/satellite Channels, video gaming On Demand, movie On Demand, mini bar, alarm clock, iHome: with iPod & radio, voicemail, in-room electronic safe, TV-speakers/music in WC and coffee/tea making facilities. For amenities like in-room wireless Internet, fixed & portable telephones and Wi-Fi access in public areas the importance score was significantly higher than the satisfaction score. In order to achieve a better understanding of the importance and satisfaction of each technology, an importance-satisfaction matrix was performed as is shown in figure 3.

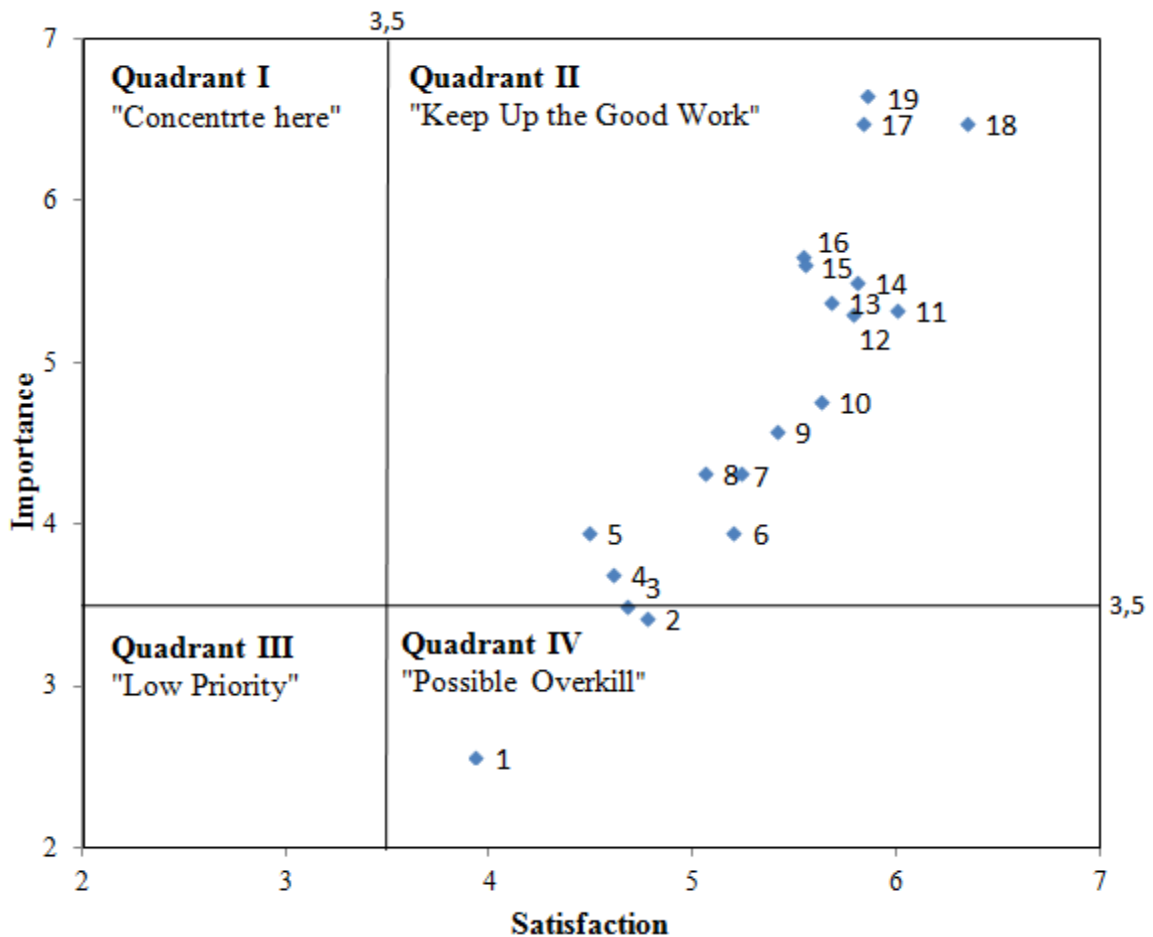


Figure 3. Importance-Satisfaction Analysis Grid.

Number	Technology
1	Video gaming On Demand
2	CD/DVD Player
3	Voicemail
4	Movie On Demand
5	In-room TV on bathroom
6	Alarm clock
7	TV-Speakers/Music in WC
8	ihome: with iPod & radio
9	Fixed & portable telephones
10	Mini bar
11	LCD Television
12	Coffee/Tea making facilities
13	In-room electronic safe
14	Cable/Satellite Channels
15	24 hour Net center
16	Hair dryer
17	Wi-Fi access in public areas
18	Air Conditioning
19	Wireless Internet (in-room)

The four quadrant importance-satisfaction matrix shows respondents' ranking of the 19 technologies for both importance and satisfaction. Each of the quadrants represents how important the technology was relative to the perceived satisfaction by respondents. With this matrix it is possible to identify where the gaps are (ex. the amenity is high in importance but low in satisfaction). The results of this analysis are the following:

Fortunately, there are no technologies present in the **first quadrant (Concentrate here)**, meaning that respondents were satisfied with all the technologies that they considered important. A similar study also did not result in any technologies in this quadrant, meaning that "all the technologies rated as important also meet guests' expectations" (Nasoz, 2011).

**The second quadrant (Keep up the good work)**, includes the technologies that are both high in importance and satisfaction. Nearly all of the technologies are placed in this quadrant: movie On Demand, in-room TV in the bathroom, alarm clock, TV-speakers/music in WC, iHome: with iPod & radio, fixed & portable telephones, mini bar, LCD television, coffee/tea making facilities, in-room electronic safe, cable/satellite channels, 24 hour net center, hair dryer, Wi-Fi access in public areas, air conditioning

and in-room wireless Internet. These findings are consistent with a related study that show similar technologies in this quadrant, such as: in-room movie On Demand, in-room wireless high-speed Internet, in-room temperature control and in-room electronic safe (Nasoz, 2001).

Based on the findings of this matrix, these technologies functionally increase guest satisfaction and hoteliers should maintain the high performance of these technologies. However, some technologies in this quadrant such as wireless Internet, air conditioning, hair dryer, Wi-Fi access in public areas and 24 hour net center were ranked with higher levels of importance than satisfaction, meaning they could be improved to enhance the guest experience.

**In quadrant III (Low priority)** there are no technologies present, which means that there were no technologies that were both low in importance and satisfaction.

**Quadrant IV (Possible Overkill)** includes video gaming On Demand, CD/DVD player and voicemail which were low in importance but whose satisfaction was rated highly. When comparing these results with a previous study, the voicemail amenity was also placed in this quadrant. However, in contrast, video gaming On Demand was included in quadrant III as a low priority for guest (Nasoz, 2011). Although customers are satisfied with those attributes they are not very important for them, therefore managers should consider current efforts in this area as superfluous.

The Importance - Satisfaction Matrix Analysis was made based on two previous similar studies (Bilgihan, et al., 2011; Nasoz, 2011).

### **4.3. Last stay in a Portuguese upscale hotel**

It was evident that 39.7% of the respondents had only stayed at a Portuguese upscale hotel one time per year, while 35.5% stayed twice, and almost one quarter of respondents (24.8%) claimed to have stayed in an upscale hotel three or more times a year (see appendix III - 3).

In general almost all respondents (91%) were satisfied with the technological amenities that they found in their last upscale hotel stay in Portugal. Although 94.9% of respondents reported that technology had a positive impact on their experience, 52.3%

stated that they would like to add new technologies or change some of them for new ones to have a better/different experience. On the other hand, 42.6% of the sample considered enough the available technologies to have a good experience, they would not change or add anything. Finally, 4.5% of respondents stated that the available technologies did not have a positive impact on their experience; they reported the need for new and more advanced technologies. Only 0.6% of respondents reported that the available technologies had a negative impact on their experience because they were outdated. This part of the sample also needed new technologies to improve their experience (see Table 11).

**Table 11. Satisfaction with technologies and their impact on guest experience.**

<b>Satisfaction with technologies and their impact on guest experience</b>			
		<b>N</b>	<b>%</b>
Are you satisfied with the technologies that you found in your last upscale hotel stay?	<b>Yes</b>	<b>282</b>	<b>91.0%</b>
	No	28	9.0%
Do you think that the available technologies in your last upscale hotel stay had a positive impact on your experience?	Yes, but I would like to change some of them for new technologies to have a better/different experience.	48	15.5%
	Yes, but I would like to add new technologies to have a better/different experience.	114	36.8%
	<b>Yes, the available technologies were enough to provide me with a good experience. I would not change or add anything.</b>	<b>132</b>	<b>42.6%</b>
	No, I need new and more advanced technologies; the available ones did not have a positive impact on my experience.	14	4.5%
	Not at all, the available technologies had a negative impact on my experience, they were very outdated. I need new technologies.	2	0.6%

#### 4.4. Importance of the latest technological amenities

Survey participants were asked to rate the importance of 14 technological amenities in a future hotel stay according to which ones they think will enhance their experience the most. Descriptive statistics were used to identify the most and least important technologies to guests. Table 12 presents the means and standard deviations of the importance level for attributes reported by respondents.

**Table 12. Importance of latest technological amenities**

Descriptive Statistics - Importance			
Latest technological amenities	N	Mean	Std. Deviation
Free high-speed Internet in-room	310	6.51	1.023
Free high-speed Internet in public areas	310	6.35	1.072
In-room Tablet or iPad	310	5.32	1.787
Virtual concierge in the lobby	310	5.24	1.682
Application for check-in, choose their exact room and check-out	310	5.17	1.798
In-room Interactive TV	310	4.99	1.700
Mobile application that enables guests to control the room	310	4.89	1.815
In-room check-out system through TV	310	4.54	1.793
Video conference and telepresence in meeting rooms	310	4.43	1.941
Self-service check-in and check-out kiosks in the lobby	310	4.40	1.766
Guestroom Lock Access via guests' mobile phone	310	4.27	2.003
In-room Interactive mirror/ wall	310	3.56	1.911
In-room interactive table touch screen	310	3.37	1.794
In-room Xbox 360 Consoling with kinect sensor.	310	2.25	1.671

Free in-room high-speed Internet and in public areas, in-room tablet or iPad, virtual concierge and the application for check-in, option to choose the exact room and check-out were perceived by respondents as the 5 most important technologies to enhance their experience. On the other hand, respondents reported that self-service check-in and check-out kiosks in the lobby, guestroom lock access via guests' mobile phone, in-room Interactive mirror/wall, in-room interactive table touch screen and in-room Xbox 360 Consoling with kinect sensor were the 5 least important technological amenities to have available in a future hotel stay.

**4.4.1. Preferences of check-in/check-out, room control and ordering room service**

Survey participants were asked to choose how they would like to check-in and check-out, to control the room, to order room service or to make service reservations. The results are present in Table 13.

**Table 13. Technological preferences to check-in/out, room control and order a service.**

<b>If you have all the following options available to you, which one would you prefer to use:</b>		<b>N</b>	<b>%</b>
Check-in	Front desk	134	43.2%
	Self-service check-in kiosks	36	11.6%
	<b>Smartphone Application</b>	<b>140</b>	<b>45.2%</b>
Check-out	Front desk	82	26.5%
	Self-service check-out kiosks	40	12.9%
	<b>Smartphone application</b>	<b>147</b>	<b>47.4%</b>
	Check-out system through TV	41	13.2%
Room Control	<b>Tablet or iPad</b>	<b>157</b>	<b>50.6%</b>
	Smartphone application	83	26.5%
	Interactive TV	67	21.6%
	traditional method – by hand	3	1.3%
Order room service or to make a service reservation	Hotel Room Phone	44	14.2%
	<b>Tablet or iPad</b>	<b>150</b>	<b>48.4%</b>
	Smartphone application	97	31.3%
	Interactive TV	19	6.1%

The majority of respondents (56.8%) would like to use digital options for the check-in process. From this 56.8%; 45.2% prefer to use the Smartphone application and only 11.6% reported a willingness to use a self-service check-in kiosk. Nevertheless, many hotel guests still prefer to go to the front desk to check-in (43.2%). On the other hand, the number of respondents that prefer to go to the front desk to check-out is lower (26.5%). The Smartphone application was the first option to check-out for almost half of the respondents (47.4%); check-out system on TV and self-service check-out kiosk were the other options among respondents at 13.2% and 12.9% respectively.

Nearly one half of respondents would like to use a Tablet or iPad for room control, while slightly more than one quarter would prefer a Smartphone application. Almost one quarter of the sample (21.6%) chose the interactive TV and only 1.3% said they would like to use the traditional method, by hand. Only 14.2% of the sample said the hotel room phone would be their first option when ordering room service or to make service reservations. All other respondents (85.8%) stated that they would like to use

digital options. The majority of them (48.4%) chose the Tablet or iPad and the second most frequently option was the Smartphone application (31.3%). The remaining part of the sample (6.1%) chose the interactive TV as the preferred option of ordering room service.

**4.4.2. New guestroom technologies and hotel selection**

The conclusion according to the answers of 310 respondents was that the availability of new guestroom technologies can influence their decision in choosing a hotel (Table 14). However, some respondents are not willing to pay extra for a guestroom with the latest technologies (27.1%), whereas the majority of the sample (54.5%) are willing to pay between 1 and 20 Euros to have it (Table 15). A smaller portion of the sample (14.2%) is willing to pay between 21 to 50 Euros and only 4.2% of respondents said they would pay more than 50 Euros extra. This result can be related to the fact that guests answered that they are looking for a unique/different experience in terms of stay and facilities (73.2%), which can be achieved with a guestroom with the latest technologies (see Table 15).

**Table 14. New guestroom technologies and hotel selection**

Descriptive Statistics			
	N	Mean	Std. Deviation
The availability of new guestroom technologies impacts my decision when choosing a hotel.	310	4.88	1.386
I am willing to pay extra for a guestroom which has the latest technologies.	310	4.06	1.575

**Table 15. Propensity of customers to pay for a room with new technologies and new hotel experience**

		N	%
How much more are you willing to pay to stay in a guestroom that has the latest in-room technologies?	I am not willing to pay more.	84	27.1%
	<b>1-10 €</b>	<b>106</b>	<b>34.2%</b>
	11-20€	63	20.3%
	21-30€	26	8.4%
	31-40€	12	3.9%
	41-50€	6	1.9%
	More than 50€	13	4.2%
Are you looking for a unique/different experience in terms of stay and facilities?	Yes	<b>227</b>	<b>73.2%</b>
	No	48	15.5%
	I am just looking for a room.	35	11.3%



## 4.5. Guests' technological preferences across purpose of travel and generation

### 4.5.1. One way ANOVA - Purpose of travel

In order to analyze what differences exist for guest preferences across purpose of travel a one-way ANOVA was computed to estimate a model with the importance score for each technology as the dependent variable and the purpose of travel (Leisure or Business) as the independent variable. Comparing the means of the importance of technologies showed that the importance was higher for Business Travelers than Leisure guests. This finding is not consistent with some of the previous studies that found no significant difference between leisure and business travelers (Center of Marketing Effectiveness, 20005; Nasoz, 2011). However, other previous studies showed that despite the fact that leisure guests are devouring digital content more than ever before (Murray, 2013), business travelers continue to be more likely than leisure guests to use some new technology such as Wi-Fi and hotel applications (Google Traveler Study, 2014). This it is consistent with the findings of this study as the results of the tests showed that the following technologies were significantly more important for business travelers than for leisure guests: in-room tablet or iPad ( $p < 0.05$ ), in-room interactive TV ( $p < 0.05$ ), free high-speed Internet in-room ( $p < 0.05$ ), guestroom lock access via guests' mobile phone ( $p < 0.05$ ), applications for check-in and check-out, mobile application to control the room ( $p < 0.05$ ), self-service check-in and check-out kiosks ( $p < 0.05$ ), free high-speed Internet in the public areas ( $p < 0.05$ ), and video conference and telepresence in meeting rooms ( $p < 0.05$ ) (see Table 16). Although both the business and leisure travelers identified free high-speed Internet as the most important technological amenity in a hotel, the need and importance of Wi-Fi service in a hotel is higher for business travelers than for leisure guests, which is consistent with a study conducted by Lee & Tussyadiah (2010).

Business travelers were referred to in other studies as the type of travelers with a higher desire to have digital involvement with hotels (Magnani Caruso Dutton, 2013), they want greater ability to choose their exact room with an application for check-in<sup>31</sup>, and prefer to check-in though self-service methods such an application or a kiosk (Weed,

<sup>31</sup> <http://news.hiltonworldwide.com/index.cfm/newsroom/detail/27192>

2013). All these facts were verified in this study, meaning that business travelers are more technologically savvy travelers than leisure guests; they are the ones that most want to have a digital experience with new technologies in upscale hotels.

**Table 16. One-way ANOVA - Purpose of travel**

Technologies	Purpose of travel	Mean	F	Sig
1- In-room Xbox 360 Consoling with kinect sensor	Leisure	2.30	0.260	0.611
	Business	2.17	0.260	0.611
2 - In-room Tablet or iPad	Leisure	5.16	5.932	<b>0.016</b>
	Business	5.79	5.932	0.016
3 - In-room check-out system through TV	Leisure	4.41	1.981	0.160
	Business	4.78	1.981	0.160
4 - In-room interactive table touch screen	Leisure	3.38	0.001	0.982
	Business	3.38	0.001	0.982
5 - In-room Interactive mirror/ wall	Leisure	3.61	0.090	0.765
	Business	3.52	0.090	0.765
6 - In-room Interactive TV	Leisure	4.85	6.439	<b>0.012</b>
	Business	5.46	6.439	0.012
7 - Free in-room high-speed Internet	Leisure	6.41	7.742	<b>0.006</b>
	Business	6.81	7.742	0.006
8 - Guestroom Lock Access via guests' mobile phone	Leisure	3.99	16.680	<b>0.000</b>
	Business	5.13	16.680	0.000
9 - Applications for check-in and check-out	Leisure	4.95	9.357	<b>0.002</b>
	Business	5.73	9.357	0.002
10 - Mobile application to control the room	Leisure	4.67	8.341	<b>0.004</b>
	Business	5.41	8.341	0.004
11 - Self-service check-in and check-out kiosks	Leisure	4.18	7.092	<b>0.008</b>
	Business	4.84	7.092	0.008
12 - Virtual concierge in the lobby	Leisure	5.25	0.878	0.350
	Business	5.02	0.878	0.350
13 Free high-speed Internet in public areas	Leisure	6.26	5.123	<b>0.024</b>
	Business	6.62	5.123	0.024
14 - Video conference and telepresence in meeting rooms	Leisure	4.06	20.043	<b>0.000</b>
	Business	5.29	20.043	0.000

**4.5.2. One -way ANOVA - Generations**

In order to analyze if there are differences in guests' preference across generations, a one-way ANOVA was computed between generations (independent variables) and the importance score of each technology (dependent variable), as shown in Table 18. First, the age groups were coded according to the generations to which they belonged. Therefore, the respondents with ages between 18 and 34 were coded as Gen Y, the ones

between 35 and 54 years old were coded as Gen X, and finally the respondents coded as Baby Boomers were ones whose ages ranged from 55 to 64. The respondents who were older than 65 years were not considered for this analysis.

The results indicated that the importance score of the majority of the technologies were not significant across generations. However the results showed that the Xbox 360 consoling with a kinect sensor ( $p < 0.05$ ), in-room interactive table touch screen ( $p < 0.05$ ), in-room interactive mirror/wall ( $p < 0.05$ ), and guestroom lock access via guests' mobile phone ( $p < 0.05$ ) were significantly more important for at least one generation. Therefore, in order to understand which one of the generations are different for each technology the Post Hoc tests were performed (see Table 19). The results indicated that in-room Xbox 360 consoling, in-room interactive table and in-room interactive mirror/wall were significantly more important for Gen Y and Gen X than for Baby Boomers. This finding is consistent with previous studies indicating that the importance level of some technology is different depending on the type of technology and that younger generations are more technologically savvy than older ones (Nasoz, 2011; Center for Marketing Effectiveness, 2005).

However, none of the technology in this study showed significant difference in the importance score between Gen Y and Gen X, except for Guestroom Lock Access via guests' mobile phone, which was significantly more important for Gen X. This finding is not consistent with a previous study that indicated that Gen Y assigned significantly high importance to Guestroom Lock Access via guests' mobile phone than all the other generations (Nasoz, 201). The reason for this result might be that this specific technology was one of the technologies rated as more important for business travelers than for leisure guests. Based on this sample Gen X has a higher percentage of business travelers (30.7%) comparing with Gen Y (18.4%), which may have led to a higher level of importance of this technology attributed to Gen X (see Table 17). In general new technologies are most appreciated by the younger generations, but some technologies can be interesting for other ages and segments.

In this study Gen Y and Gen X was considered very similar in their technological preferences; the big difference existed between the younger generations and Baby Boomers. Despite Baby Boomers being open to new technology, they are less likely to

become the early adopters because privacy and safety are more important for them than for other generations (AARP & Microsoft, 2009). However, the findings of this study indicated that all generations want to be connected in a hotel. Internet access (in-room and in public areas) was the technology with the highest importance score for all the three generations.

**Table 17. Generations and purpose of travel**

<b>Number of generations</b>	<b>Generations</b>	<b>Business travelers</b>	<b>Total (N)</b>	<b>% of Business Travelers</b>
1	18 - 34 - Gen Y	37	201	18.41%
2	35 - 54 - Gen X	23	75	30.67%
3	55 - 64 -Baby Boomers	3	25	12.0%
	total	63	301	21.0%

**Table 18. One way ANOVA - Generations**

<b>Technologies</b>	<b>Generations</b>	<b>Mean</b>	<b>F</b>	<b>Sig</b>
In-room Xbox 360 Consoling with kinect sensor	1	2.44	5.698	<b>0.004</b>
	2	2.17		
	3	1.28		
2 - In-room Tablet or iPad	1	5.36	0.277	0.758
	2	5.43		
	3	5.12		
3 - In-room check-out system through TV	1	4.56	0.831	0.437
	2	4.65		
	3	4.12		
4 - In-room interactive table touch screen	1	3.44	3.687	<b>0.026</b>
	2	3.61		
	3	2.52		
5 - In-room Interactive mirror/wall	1	3.63	4.640	<b>0.010</b>
	2	3.81		
	3	2.52		
6 - In-room Interactive TV	1	5.01	0.188	0.829
	2	5.08		
	3	4.84		
7 - Free in-room high-speed Internet	1	6.48	2.130	0.121
	2	6.71		
	3	6.28		
8 - Guestroom Lock Access via guests' mobile phone	1	4.08	5.998	<b>0.003</b>
	2	5.00		
	3	4.28		
9 - Applications for check-in and check-out	1	5.23	0.903	0.406
	2	5.35		
	3	4.80		
10 - Mobile application to control the room	1	5.03	2.067	0.128
	2	5.01		
	3	4.28		
11 - Self-service check-in and check-out kiosks	1	4.42	0.287	0.751
	2	4.53		
	3	4.24		
12 - Virtual concierge in the lobby	1	5.38	1.712	0.182
	2	5.07		
	3	4.88		
13 Free high-speed Internet in public areas	1	6.33	0.697	0.499
	2	6.48		
	3	6.24		
14 - Video conference and telepresence in meeting rooms	1	4.47	0.557	0.573
	2	4.63		
	3	4.16		

**Table 19. Post Hoc Tests - Multiple Comparisons - Dunnett C**

Dependent Variable			Mean Difference (I-J)	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
1 - In-room Xbox 360 Consoling with kinect sensor	1	2	0.269	0.216	-0.25	0.78
		3	<b>1.163*</b>	0.193	0.69	1.63
	2	1	-0.269	0.216	-0.78	0.25
		3	<b>0.893*</b>	0.230	0.33	1.45
	3	1	-1.163*	0.193	-1.63	-0.69
		2	-0.893*	0.230	-1.45	-0.33
2 - In-room Tablet or iPad	1	2	-0.063	0.242	-0.64	0.51
		3	0.243	0.297	-0.49	0.98
	2	1	0.063	0.242	-0.51	0.64
		3	0.307	0.336	-0.52	1.13
	3	1	-0.243	0.297	-0.98	0.49
		2	-0.307	0.336	-1.13	0.52
3 - In-room check-out system through TV	1	2	-0.096	0.238	-0.66	0.47
		3	0.437	0.362	-0.46	1.34
	2	1	0.096	0.238	-0.47	0.66
		3	0.533	0.393	-0.44	1.50
	3	1	-0.437	0.362	-1.34	0.46
		2	-0.533	0.393	-1.50	0.44
4 - In-room interactive table touch screen	1	2	-0.176	0.245	-0.76	0.41
		3	<b>0.918*</b>	0.331	0.10	1.74
	2	1	0.176	0.245	-0.41	0.76
		3	<b>1.093*</b>	0.372	0.18	2.01
	3	1	-0.918*	0.331	-1.74	-0.10
		2	-1.093*	0.372	-2.01	-0.18
5 - In-room Interactive mirror/ wall	1	2	-0.181	0.263	-0.81	0.45
		3	<b>1.112*</b>	0.324	0.31	1.91
	2	1	0.181	0.263	-0.45	0.81
		3	<b>1.293*</b>	0.372	0.38	2.21
	3	1	-1.112*	0.324	-1.91	-0.31
		2	-1.293*	0.372	-2.21	-0.38
6 - In-room Interactive TV	1	2	-0.070	0.241	-0.64	0.50
		3	0.170	0.316	-0.61	0.95
	2	1	0.070	0.241	-0.50	0.64
		3	0.240	0.360	-0.65	1.13
	3	1	-0.170	0.316	-0.95	0.61
		2	-0.240	0.360	-1.13	0.65
7 - Free in-room high-speed Internet	1	2	-0.229	0.125	-0.53	0.07
		3	0.198	0.225	-0.36	0.76
	2	1	0.229	0.125	-0.07	0.53
		3	0.427	0.235	-0.15	1.01
	3	1	-0.198	0.225	-0.76	0.36
		2	-0.427	0.235	-1.01	0.15

Dependent Variable		Mean Difference (I-J)	Std. Error	Lower Bound	Upper Bound	
8 - Guestroom Lock Access via guests' mobile phone	1	2	-0.915*	0.261	-1.54	-0.29
		3	-0.195	0.418	-1.23	0.84
	2	1	<b>0.915*</b>	0.261	0.29	1.54
		3	0.720	0.451	-0.40	1.84
	3	1	0.195	0.418	-0.84	1.23
		2	-0.720	0.451	-1.84	.40
9 - Applications for check-in and check-out	1	2	-0.118	0.239	-0.69	0.45
		3	0.429	0.386	-0.53	1.39
	2	1	0.118	0.239	-0.45	0.69
		3	0.547	0.419	-0.49	1.58
	3	1	-0.429	0.386	-1.39	0.53
		2	-0.547	0.419	-1.58	0.49
10 - Mobile application that enables guests to control the room	1	2	0.021	0.248	-0.57	0.61
		3	0.755	0.356	-0.13	1.64
	2	1	-0.021	0.248	-0.61	0.57
		3	0.733	0.398	-0.25	1.71
	3	1	-0.755	0.356	-1.64	0.13
		2	-0.733	0.398	-1.71	0.25
11 - Self-service Check-in and check-out kiosks in the lobby	1	2	-0.115	0.243	-0.69	0.46
		3	0.178	0.305	-0.58	0.93
	2	1	0.115	0.243	-0.46	0.69
		3	0.293	0.348	-0.56	1.15
	3	1	-0.178	0.305	-0.93	0.58
		2	-0.293	0.348	-1.15	0.56
12 - Virtual concierge in the lobby	1	2	0.316	0.241	-0.26	0.89
		3	0.503	0.285	-0.20	1.21
	2	1	-0.316	0.241	-0.89	0.26
		3	0.187	0.335	-0.64	1.01
	3	1	-0.503	0.285	-1.21	0.20
		2	-0.187	0.335	-1.01	0.64
13 Free high-speed Internet in public areas	1	2	-0.147	0.127	-0.45	0.16
		3	0.093	0.239	-0.50	0.69
	2	1	0.147	0.127	-0.16	0.45
		3	0.240	0.247	-0.37	0.85
	3	1	-0.093	0.239	-0.69	0.50
		2	-0.240	0.247	-0.85	0.37
14 - Video conference and telepresence in meeting rooms	1	2	-0.154	0.263	-0.78	0.47
		3	0.313	0.436	-0.77	1.40
	2	1	0.154	0.263	-0.47	0.78
		3	0.467	0.473	-0.70	1.64
	3	1	-0.313	0.436	-1.40	0.77
		2	-0.467	0.473	-1.64	0.70

\*. The mean difference is significant at the 0.05 level.

#### 4.6. Factor Analysis

A factor analysis was conducted to get a better understanding of the underlying structure of the data (Pitt & Jeantrout, 1994) and thus create correlation variable composites from the original attributes (14 technologies) present in this analysis. In order to define sets of variables that are highly correlated (factors) a principal component analysis with orthogonal VARIMAX rotation was used. The purpose of this popular method is to simplify the columns in a factor matrix (Hair, Black, Barry, & Anderson, 2010). The factors that are highly correlated are then grouped together and adopted to represent dimensions, in this case technological dimensions for upscale hotels. The goal was to identify the main dimensions that can enhance customer experience in a future hotel stay. A factor with eigenvalues greater than 1.0 was considered significant. The solution that was represented for at least 60% of the total variance was considered a satisfactory solution and items with a factor loading (correlation of the variable with the factor) of 0.40 or higher were clustered together to form constructs (Hair et al., 2010). Using the data reduction function of the Statistical Package for Social Sciences (SPSS, 2015) an explanatory factor analysis was conducted on 14 technologies to find possible underlying dimensions.

Initially, in order to know if the factor analysis was appropriated for this study, the Kaiser-Meyer-Olkin (KMO) and Bartlett test of Sphericity were computed. The results were satisfactory, the measure of sampling adequacy (KMO) was 0.869 which is considered to be meritorious (Kaiser, 1974) because with a value of KMO above 0.8, the variables were interrelated and shared common factors. The result of Bartlett's Test of Sphericity yielded a significant chi-square value in order to test the significance of the correlation matrix (Bartlett's Test of Sphericity = 1847.738;  $df = 91$ ;  $p = 0.000$ ).

The results of the factor analysis suggested a three-factor solution that included 14 technologies and explained 60.7% of the total variance in the data. Each factor has eigenvalues greater than 1.0 and a factor loadings greater than 0.4. In order to test the reliability and internal consistency of each factor a reliability analysis (Cronbach's Alpha) was conducted. The reliability coefficients for the items in this study ranged from 0.76 to 0.85, well above the minimum value of 0.70 that is considered acceptable for basic research (Nunnally, 1978). The results of the factor analysis are displayed in



Table 20. The three factor dimensions were analyzed and named: Comfort & Convenience Technologies, Entertainment Technologies, and Internet Access.

**Table 20. Results of Factor Analysis for Technological Amenities**

Technologies	Dimensions		
	Comfort & Convenience Technologies	Entertainment Technologies	Internet Access
In-room Xbox 360 Consoling with kinect sensor		0.758821	
In-room Tablet or iPad		0.481068	
In-room interactive table touch screen		0.758896	
In-room Interactive mirror/ wall		0.783932	
In-room Interactive TV		0.523370	
Guestroom Lock Access via guests' mobile phone	0.499382		
Applications for check-in and check-out	0.796222		
Mobile application to have the room's control	0.759288		
Self-service check-in and check-out kiosks	0.770017		
Virtual concierge in the lobby	0.599048		
Video conference and telepresence in meeting rooms	0.460678		
In-room check-out system through TV	0.693122		
Free high-speed Internet in public areas			0.833069
Free in-room high-speed Internet			0.842622
<i>Eigenvalue</i>	5.804	1.665	1.032
<i>Variance Explained</i>	26.15	19.16	15.41
<i>Cronbach's Alpha</i>	0.845	0.803	0.758

N=301

Note: Kaiser-Meyer-Olkin(KMO) statistic = 0.869;

Bartlett's Test of Sphericity = 1847.738;  $df = 91$ ;  $p = 0.000$

## 4.7. Linear Regression Analysis

### 4.7.1. Guests are willing to pay extra for a guestroom with the latest technologies

With the purpose of identifying which latest technologies can have a positive impact on guests' willingness to pay extra for a guestroom a linear regression analysis was conducted to estimate a model. The importance score of technological amenities' factors are the independent variables and *I am willing to pay extra for a guestroom which has the latest technologies* is the dependent variable. The cut-off significant F value for retaining a variable was selected at the  $\alpha = 0.01$  level. The model yielded the 20.5%  $R^2$ . This analysis was made based on the factors previously estimated: *Internet Access*; *Comfort & Convenience Technologies* and *Entertainment Technologies*. From the three factors in the construct, two were found to have a statistically significant correlation with the dependent variable. The one with the biggest influence is the *Comfort & Convenience Technologies* (coefficient: 0.40) that is statistically significant at 1%. The second statistically significant factor is *Entertainment Technologies* (coefficient: 0.19) at 5% as showed in Table 21. Therefore, results indicate that guests are willing to pay extra for a guestroom with the latest technologies that belong to *Comfort & Convenience and Entertainment* dimensions. They are composed of 7 and 5 variables respectively, displayed in Table 20. However, the *Internet Access* variable was not significant, which means that guests are not willing to pay extra to have HSIA in the guestroom or in public areas.

Internet access is already considered by guests as an essential and basic amenity (Horner, 2012). According to an Index Study charging hotel guest for Internet use can have a negative impact on customer satisfaction (J.D. Power, & Associates, 2012). Therefore, HSIA it is important for guest to have a good experience as long as it is free since Internet access is not a new amenity for guests. They are only willing to pay extra for latest technologies that can provide them with a different and unique experience, such as the technologies included in the *Comfort & Convenience Technologies and Entertainment Technologies* dimensions. Hotel managers should consider offering free HSIA to reduce guest complaints. This is one option to meet customer expectations because this technology is considered by guests as a "must have" in hotels. Nowadays, guests expect their hotel room to provide the same level of speed, dependability, and convenience that their office or home network provides.

#### **4.7.2. The availability of new guestroom technologies impacts guest decision in choosing a hotel.**

In order to know if there is a relationship between the availability of latest technologies and guests' decision in choosing a hotel a linear regression analysis was conducted. It estimated a model with the importance score of technological amenities' factors as the independent variables and *the availability of new guestroom technologies impacts my decision in choosing a hotel* as dependent variable. The cut-off significant F value for retaining a variable was selected at the  $\alpha = 0.01$  level. The model yielded the 25.2%  $R^2$ . The purpose of this analysis is to identify technological amenities that have significant impact to the guests' decision in choosing a hotel based on the factors previously estimated: *Internet Access*; *Comfort & Convenience Technologies* and *Entertainment Technologies*. The results in Table 21 show that the *Comfort & Convenience Technologies* variable is statistically significant at 1%. The findings indicate that the availability of the technologies that belong to this factor (see Table 20) can have a positive impact on guests' decision in choosing a hotel. This means, that one unit of increase in the *Comfort & Convenience Technologies* factor would lead to a 0.42 unit increase in guests' decision in choosing a hotel. Interestingly, the *Internet Access* and *Entertainment Technologies* variables were not found to be significant or have an impact on guests' decision in choosing a hotel.

Some studies in the literature review showed that internet access was a key factor when choosing a hotel (Bilgihan, et al., 2010; iBAHN, 2011 and Hotel Internet Service, 2010). However, despite being very important technology for guests, Internet access is no longer a differentiating factor among hotels. Nowadays, many hotels already provide free Wi-Fi, even hotels with only two stars. Therefore, in upscale hotels guests are expected to find this service with better quality and for free too. With the current mobile technology almost all guests already have Internet access on their Smartphones to check email or search for something important, therefore, Internet access is considered to be a "must have" in a hotel and not as a key factor in the process of choosing a hotel.

Entertainment technologies are options that guests also appreciate, providing moments of fun and pleasure, but which are not vital for deciding on the hotel. Guests show willingness to use them; they are even willing to pay extra to have a moment of

entertainment because these technologies have the power to transform the stay into a better experience. However, when a guest is choosing a hotel the entertainment amenities have no impact on this choice. On the other hand, the comfort & convenience technologies already have another use. For example, if a business traveller needs a hotel with video conference, the choice of the hotel will be made based on this technology. Or if a guest does not have much time it can be very important and even a decisive factor to pick the hotel that has an application for check-in and ability to open the room's door through the mobile phone. These are the kind of technologies that have more impact in the process of choosing a hotel.

**Table 21. Linear Regression Analysis**

	The availability of new guestroom technologies impacts my decision when choosing a hotel			I am willing to pay extra for a guestroom which has the latest technologies		
	B	t		B	t	
<b>Constante</b>	1.870	3.899	**	1.543	2.747	**
<b>IA</b>	0.10	1.21		-0.02	-0.18	**
<b>CC</b>	0.42	5.64	**	0.40	4.66	**
<b>ET</b>	0.11	1.57		0.19	2.38	*
	R <sup>2</sup> =25.2; F=34.294**			R <sup>2</sup> =20.5; F=26.32**		
	** statistically significant at 1%, * 5%					

IA- Internet Access; CC- Comfort & Convenience; ET - Entertainment Technologies

## Chapter 5 – Conclusions

This chapter provides the summary of results, attempting to answer the proposed research questions. Then, the contribution of this study for academic research is presented. It also presents the contribution of this study for upscale hotels in order to enhance guest experience. Finally, this study's limitations are identified, as well as suggestions for further research.

### 5.1. Summary of results

In order to analyse the impact of technology on customer experience in upscale hotels, a survey was constructed and had 310 valid responses.

In respect to the first main goal of this study regarding the 19 current technologies, findings provided evidence that the top five most important technologies for guest are: in-room wireless Internet, air conditioning, Wi-Fi access in public areas, cable/satellite channels and LCD Television. On the other hand, respondents identified On Demand movies, in-mirror TV in the bathroom, voicemail, CD/DVD player and video gaming On Demand as the five least important technologies to have a good experience.

Based on the findings of the Importance-Satisfaction matrix was concluded that all of the following technologies have a significant impact on customer experience: movies On Demand, in-room TV in the bathroom, alarm clock, TV-speakers/music in WC, iHome: with iPod & radio, fixed & portable telephones, mini bar, LCD television, coffee/tea making facilities, in-room electronic safe, cable/satellite channels, 24 hour net center, hair dryer, Wi-Fi access in public areas, air conditioning and in-room wireless Internet. These technologies were rated by guests as having high levels of importance and satisfaction. Therefore, they would like to use them during their hotel stay. Hoteliers should keep these technologies with high performance because these technologies have the function of increasing guest satisfaction and enhancing customer experience. On the other hand, the three remaining technologies (video gaming On Demand, CD/DVD player and voicemail) were considered by guest as not very important but with high levels of satisfaction. This indicates that managers may consider reallocating the budget of these technologies to other ones that guests give more importance to.

In general almost all respondents were satisfied with the technologies that they found on their last upscale hotel stay in Portugal. Despite the 94.9% of respondents considered that the available technologies had a positive impact on their experience, more than half of the sample (57.4%) would like to have new technologies to enhance their experience.

In relation to the second main goal of this study regarding the 14 latest technologies, the following 5 were perceived by respondents as the most important technologies to enhance their experience: free in-room HSIA, free HSIA in public areas, in-room tablet or iPad, virtual concierge and the application for check-in, choice in the exact room and check-out. This suggests that hoteliers should invest in these technologies to offer a better experience for guests. On the other hand respondents rated self-service check-in and check-out kiosks in the lobby, guest room lock access via mobile phone, in-room interactive mirror wall, in-room interactive table touch screen and in-room Xbox 360 Consoling with kinect sensor as the 5 least important technological amenities to create a better experience. Since some of these technologies are not very common in either homes or at hotels, guests may not see them as priority technology to have in a hotel at this point. However, technologies that are not considered mainstream may be categorized as disruptive technologies (Christensen, 1997; Cobanoglu, 2001). In other words, after these technologies start to become more common, the demand for them may increase, which can result in a competitive advantage for hotels. This may be an important consideration for hoteliers contemplating near-future technology investments. Disruptive technologies should not automatically be dismissed or ignored in strategic planning (Cobanoglu et al., 2011).

Concerning the guests' technological preferences for check-in and check-out, the majority of respondents would like to use digital options, the highest choice was the Smartphone application at nearly 50%. Nevertheless, many hotel guests still prefer to go to the front desk to check-in (43.2%). Contrastingly, the number of respondents that preferred to go to the front desk to check-out was lower (26.5%). Nearly one half of respondents would like to use a Tablet or iPad to control the room, to order room service or to order service reservations. These results showed that respondents have a strong desire to genuinely experience something new, the traditional methods for these processes are no longer the way to exceed the guests' expectations. The majority of

respondents were interested in the digital world and hoteliers need to keep up with the technological advancements to be able to maintain and acquire new guests.

The differences of guests' technological preferences across purpose of travel and age were also analyzed. The data showed that the following technologies are more important for business traveler than for leisure guests: in-room tablet or iPad, in-room interactive TV, free in-room high-speed Internet, guestroom lock access via mobile phone, applications for check-in and check-out, mobile application to control the room, self-service check-in and check-out kiosks, free high-speed Internet in public areas, and video conference and telepresence in meeting rooms. Therefore, business travelers exhibit a greater desire to have digital involvement with the hotels they stay in. Despite leisure guests' growing interest in technology, hoteliers should consider that still there are some differences between business and leisure guests.

In terms of generational analysis, this study found that the importance level of the same technologies showed some difference among generations. While Gen Y and X had similarities regarding their technological preferences, the greatest contrast was between the younger generations and Baby Boomers. The results specifically showed that in-room Xbox 360 consoling, in-room interactive table and in-room interactive mirror/wall were significantly more important for Gen Y and Gen X than for Baby Boomers. All the other latest technologies were perceived to be important for all generations. Despite not having found dramatic differences between generations hoteliers should consider the latest technologies to be more important for younger generations than for Baby Boomers.

In order to get a better understanding of the underlying structure of the data a factor analysis was conducted after a Kaiser-Meyer-Olkin (KMO) and Bartlett test of Sphericity. These tests revealed that a factor analysis was appropriated for this study. Therefore, a three-factor dimension was suggested, *Comfort & Convenience Technologies*; *Entertainment Technologies* and *Internet Access*.

According to descriptive statistics, the availability of new guestroom technologies can influence a guest's decision in choosing a hotel. However, it is important to note that not all of the latest technologies influence guests' decision-making equally.

The regression analysis revealed that *Internet Access* such as HSIA in-room and in public areas and *Entertainment Technologies* such as in-room Xbox 360 consoling, in-room tablet or iPad, in-room interactive table touch screen, in-room interactive mirror/wall and in-room interactive TV appear to have no direct impact on a guest's decision in choosing a hotel. On the other hand, *Comfort & Convenience Technologies* were found to be a strong factor impacting guests' decision in choosing a hotel. This set of amenities that possess significant potential to positively influence guest decision in choosing a hotel includes: guestroom lock access via guests' mobile phone, mobile applications for check-in and check-out, mobile application to control the room, self-service check-in and check-out kiosks, virtual concierge in the lobby, video conference and telepresence in meeting rooms and in-room check-out system through TV.

Regarding the willingness of guests to pay extra for a guestroom with the latest technologies the result showed that the majority of the sample was willing to pay for it. However, the regression analysis revealed that guests are not willing to pay extra to have internet access (in-room HSIA and in public areas). Rather, they are willing to pay more for a guestroom with the latest technologies that belong in the categories of *Comfort & Convenience technologies and Entertainment Technologies*. This willingness to pay extra can be related to the fact that almost 75% of respondents are looking for a unique and different experience in terms of stay and facilities, which can be achieved with the latest technologies.

When comparing the interviews and questionnaire results the conclusion was that manager and guest perceptions have congruence. Both indicated that technologies have a positive impact on guest experience and that the most important technology for guests is Wi-Fi Internet. According to the perception of managers, guests are satisfied with the available technologies but they could be more pleased. Although access to the Internet has become a requirement for all customers, hotel managers consider that business travelers are more demanding about technologies than leisure guests. They also referred that technology impacts the guests' decision in choosing a hotel, which is consistent with findings of the guest's questionnaire. Despite the conclusion that guests are looking for a new experience, hotel managers were not in unanimous agreement regarding this issue. Nevertheless, hoteliers consider invest in new technologies to be important. According to the findings, hoteliers identified "enhancing customer



experience" as the main goal of investing in new technology. This is particularly important because the findings of the study suggest that technology is indeed an important factor to enhance guest experience. This validated information could be helpful for hoteliers that invested or are investing in technology in their respective hotels.

## **5.2. Contribution for academic studies and for hotel managers**

Since it is important to replicate studies related with technology at least every 2 years, to reflect changes in the technology (Bilgihan, et al., 2011) the main contribution of this study for academic research is to include the latest technological trends in the hotel industry. In doing so, it follows the advice of previous studies which states that future research should include new technologies such as iPad and Xbox. (Nasoz, 2011) and other emerging in-room technologies (Jung et al., 2014).

This study adds value because upgraded information regarding the most important technologies currently available for guests was obtained, and also because demonstrated which latest technologies have a strong potential to enhance the guest experience. Some of the latest technologies of this study have not been analyzed in similar previous academic researches. This study is also important because it focused on the perceptions of both the managers and customers, providing a more comprehensive understanding of the study.

The finding of this study are recommended to help hotel managers understand the impact of different technology on guest experience, providing guidance for hoteliers in purchasing, upgrading or implementing new technologies that guests want to have in a hotel stay. Therefore, if hoteliers decide to follow the advice of this study they can achieve greater differentiation by offering the most important latest technology for guests, enhancing their experience and also attracting new customers, potentially resulting in an increase in revenues.

## **5.3. Study limitations and avenues for future researches**

One of the limitations of this study was obtaining access and assistance when distributing the questionnaires in the hotel lobby. In some upscale hotels managers explained that it was not possible to distribute the questionnaires so as not to disturb the

guests. Another limitation was the availability and patience of guests to fill the questionnaire, especially because it is not the most interesting thing to do while on holiday or conducting business.

The majority of respondents were leisure guests. A study with equal numbers of business travelers and leisure guests may provide different results. Future research should have a heterogeneous sample in order to analyze the technology preference differences between leisure and business guests in greater depth to verify if there is a difference in the results. Future research should also have a more segmented analysis to evaluate the results by the type of guests (family group, couple, single, and friends) and by the frequency of their stay.

A second reproduction of this study, with a larger sample, should attempt to explore international regions such as Europe and Asia with advanced technology development to investigate whether any variation in the perceived importance of technologies exists in different regions. Future research can also include other emerging technologies to examine differences among these technologies.

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## Appendices

### Appendix I - Interview guide for hotel managers

#### I. Current technological amenities in upscale hotels

1. What are the current technological amenities for guests in the hotel? (in-room, lobby, restaurant, mobile applications, meeting room)

#### II. Manager perception of the guest's experience regarding technology

2. Do you think that technology has a big impact on customer experience?
3. Which technologies do you think are most important for guests?
4. Do you consider that the available technology at the hotel has an impact on the customer's decision when choosing a hotel?
5. Is there a big difference in the demand for technologies between leisure guests and business travelers?
6. Have customers been looking for a new experience with new technology?
7. Do you think that customers are satisfied with the available technology?

#### III. Manager Perception – importance of new technology and the hotel's success.

8. Which is the main goal of the implementation of new technology for the hotel?
  - Improve customer experience and consequently their satisfaction
  - Improve efficiency of employees
  - Increase profits
  - Reduce costs
  - Other .....
9. Which area has a higher priority of investment for new technologies?
  - In-room
  - Lobby
  - Restaurant / Bar
  - Meeting room
  - Other ....
10. Have a considerable number of investments in the technological area been done in the hotel?

11. Do you consider investing in new technologies to provide a better customer experience to be important?
12. Have the implemented technologies contributed to the success of the hotel?
13. Was there an increase in the occupancy rate due to the implementation of some technologies?

#### **IV. Innovation & development**

14. Is there a team for innovation and development testing of new technologies in pilot rooms to get customer feedback?

#### **V. Latest and future technologies**

15. What were the latest implemented technologies in the hotel?
16. Which technologies do you intend to implement in the future?

## Appendix II - Hotel guest questionnaire

### Thesis Questionnaire:

The following questionnaire falls within the framework of my Master of Science in Business Administration thesis at ISCTE Business School. The goal of this study is to analyze the impact of technology on customer experience in Portuguese upscale hotels. The target participants for this questionnaire are customers, with more than 17 years old, that have already attended one or more upscale hotels (4 or 5 stars) within the immediate past 12 months in Portugal.

All answers are anonymous and confidential; the data collected will be used just for academic purposes. Thank you in advance for your collaboration.

**Upscale Hotel Definition:** An upscale hotel is described as a four to five star hotel.

**Did you stay in a Portuguese upscale hotel (4/5 stars) at least once in the past 12 months?**

- Yes  
 No

If you answered no, the questionnaire for you it is over. If you answered yes you can start the questionnaire.

### Part I – Demographic Characteristics

1. How old are you? \_\_\_\_\_
2. In which country do you reside? \_\_\_\_\_
3. Gender?  Male  Female
4. Marital status?  Single  Married/live together  Divorced  Widowed
- What is your current employment situation?  Employed;  Unemployed;
- Studying;  Retired;  Studying and working
- Other \_\_\_\_\_

**Part II - Last stayed in a Portuguese upscale hotel**

1. What was the last upscale hotel (4 or 5 star hotel) where you stayed in Portugal in the last 12 months? (Name of the hotel and location please): \_\_\_\_\_
2. Why did you choose this hotel?
  - Location       Price/Quality       Services and facilities       Technological amenities (ex: Wi-Fi)
  - Recommendations;       Website reviews       Other. \_\_\_\_\_
3. What was the main purpose of your trip in your last stayed in a Portuguese upscale hotel?
  - Leisure       Business       Business and Leisure       Other \_\_\_\_\_
4. In your last upscale hotel stay, in Portugal, did you travel:
  - Alone       With friends       As a couple       With family       Other \_\_\_\_\_

**Importance and satisfaction with technologies according your last upscale hotel stay in Portugal.**

5. Please rate the technologies below according an **importance** scale from 1 to 7. 1 means not important at all; 7 means extremely important to have a good experience.

Please answer with a circle around the number.	Not Important							Very Important	
<b>In-room Technologies:</b>									
LCD Television	1	2	3	4	5	6	7		
CD/DVD Player	1	2	3	4	5	6	7		
Cable/satellite TV	1	2	3	4	5	6	7		
Video gaming on demand	1	2	3	4	5	6	7		
Movie on demand	1	2	3	4	5	6	7		
Mini Bar	1	2	3	4	5	6	7		
Alarm Clock	1	2	3	4	5	6	7		
IHome: with iPod hub & radio	1	2	3	4	5	6	7		
Air Conditioning	1	2	3	4	5	6	7		
Wireless Internet	1	2	3	4	5	6	7		
Fixed &portable telephones	1	2	3	4	5	6	7		
Voice Mail	1	2	3	4	5	6	7		
In-Room Electronic Safe	1	2	3	4	5	6	7		
TV-Speakers /Music in WC	1	2	3	4	5	6	7		
Hair dryer	1	2	3	4	5	6	7		
in-Mirror TV on the bathroom	1	2	3	4	5	6	7		
Coffee/Tea making facilities	1	2	3	4	5	6	7		
<b>LOBBY:</b>									
Wi-Fi access in public areas	1	2	3	4	5	6	7		
Net center 24 hours	1	2	3	4	5	6	7		

**6.** Please rate the technologies below according your **satisfaction** with them. The scale is from 1 to 7. 1 means not satisfied at all; 7 means extremely satisfied. Other options are (A) = not applicable/not available; and (B) = available but I never used it.

Please answer with a circle around the number or letter.			Not Satisfied				Very Satisfied			
	A	B	1	2	3	4	5	6	7	
<b>In-room Technologies:</b>										
LCD Television	A	B	1	2	3	4	5	6	7	
CD/DVD Player	A	B	1	2	3	4	5	6	7	
Cable/satellite TV	A	B	1	2	3	4	5	6	7	
Video gaming on demand	A	B	1	2	3	4	5	6	7	
Movie on demand	A	B	1	2	3	4	5	6	7	
Mini Bar	A	B	1	2	3	4	5	6	7	
Alarm Clock	A	B	1	2	3	4	5	6	7	
iHome:with iPod hub & radio	A	B	1	2	3	4	5	6	7	
Air Conditioning	A	B	1	2	3	4	5	6	7	
Wireless Internet	A	B	1	2	3	4	5	6	7	
Fixed & portable telephones	A	B	1	2	3	4	5	6	7	
Voice Mail	A	B	1	2	3	4	5	6	7	
In-Room Electronic Safe	A	B	1	2	3	4	5	6	7	
TV-Speakers /Music in WC	A	B	1	2	3	4	5	6	7	
Hair dryer	A	B	1	2	3	4	5	6	7	
in-Mirror TV on the bathroom	A	B	1	2	3	4	5	6	7	
Coffee/Tea making facilities	A	B	1	2	3	4	5	6	7	
<b>LOBBY:</b>										
Wi-Fi access in public areas	A	B	1	2	3	4	5	6	7	
Net center 24 hours	A	B	1	2	3	4	5	6	7	

7. Are you satisfied with the technologies that you found in your last upscale hotel stay in Portugal?

Yes;  No

8. Do you think that available technologies in your last upscale hotel had a positive impact on your experience?

Yes, but I would like to change some of them by new technologies to have a better/different experience.

Yes, but I would like to add new technologies to have a better/different experience.

Yes. the available technologies were enough to provide me a good experience. I would not change or add anything.

No, I need new technologies, more advanced; the available ones not had a positive impact on my experience.

Not at all, the available technologies had a negative impact on my experience, they were very outdated.

**Part III - Latest and future technological amenities**

1. Please rate the importance of the following technologies for you according a scale from 1 to 7. Selecting "Not At All Important (1)" means that the particular technology will be not useful or needed at all during your hotel stay. Selecting "Extremely Important (7)" means you think that the particular technology will enhance your experience. **Please also say** if you already had the opportunity to use them in a hotel, in Portugal or in other country. (A) I never used, or (B) I already used. Please answer with "X".

Technologies	Not at all important (1)	Unimportant (2)	Not so important (3)	Neither important nor Unimportant (4)	Important (5)	Very Important (6)	Extremely Important (7)	I never used (A)	I already used (B)
<b>In-room:</b>									
Xbox 360 Consoling with kinect sensor that uses body gestures and voice recognition to control games and entertainment.									
Tablet or iPad with internet, games and applications that allow guests to take <b>control of the room</b> (control heating systems, air conditioning, lighting, music, tv and control the curtains) to make restaurant reservations, order room service, order airline tickets, etc									
<b>In-room check-out system through TV</b>									
In-room interactive <b>table</b> touch screen with internet games and various multimedia applications.									
In-room <b>Interactive mirror</b> /wall with a host of applications (to go to internet, to see movies, to personalize room with photos, etc.)									
In-room <b>Interactive TV</b> with internet, control of the room, order room service, make reservations, a digital concierge with a personalized service, etc.									
Free high <b>speed internet</b> in-room									
<b>Applications mobile phone:</b>									
Guest Room Lock Access via guest's mobile phone									
Applications for check in, choose their exact room from digital floor plans and check-out									
Mobile application that enables guests to take the room's control, to order room service, make services reservations, etc.									
<b>Lobby:</b>									
Self-service Check in and check-out <b>kiosks</b>									



<b>Virtual concierge:</b> touch screen with all the information about the city: restaurant tips, flight arrivals and departures and driving directions via these devices to guests.											
Free <b>high speed internet</b> in the public areas											
<b>Meeting room:</b>											
Video conference and telepresence											

2. If you have all the following options available to do the **Check-in**, which one would do you prefer?  
 Front desk     Self -service Check-in Kiosks     Smartphone Application  
 Other \_\_\_\_\_
3. If you have all the following options available to do the **Check-out**, which one would do you prefer?  
 Front desk     Self- service Check-out Kiosks     Smartphone application  
 Check-out system through TV     Other \_\_\_\_\_
4. If you have all the following options available to **control the room** (heating systems, air conditioning, lighting, music, tv and curtains) which one would do you prefer?  
 Tablet or iPad     Smartphone application     TV Remote Control  
 Other \_\_\_\_\_
5. If you have all the following options available to order **room service** or to make a restaurant reservation, which one would do you prefer?  
 Hotel Room Phone     Tablet or iPad     Smartphone application  
 Other \_\_\_\_\_
6. Please order the following technologies according your preference.(1) is the most important for you to have a better experience and (8) is the one with less impact on your experience. (Optional)  
 Wi-fi (Free -High Speed Internet)     Tablet or iPad in the guest room  
 Xbox with kinect sensor     In-room check-out system through TV  
 Interative TV     Mirror or table touch screen  
 Interactive walls     Cell phone as Key (Smartphone application)
7. What do you like to have available in your future hotel stay, related with technologies, that was not referred in this questionnaire?  
 \_\_\_\_\_

8. The availability of new guest room technologies impacts my decision in choosing a hotel.

Strongly Disagree							Strongly Agree	
1	2	3	4	5	6	7		

9. I am willing to pay extra for a guest room which has the latest technologies.

Strongly Disagree							Strongly Agree	
1	2	3	4	5	6	7		

10. How much more are you willing to pay to stay in a guest room which has the latest technologies?
- I am not willing to pay more       1-10 €       11-20 €       21-30€  
 31-40€       41-50       More than 50 €
11. Are you looking for a unique/different experience in terms of your stay and facilities?
- Yes;       No;       I am just looking for a room, the experience does not matter to me.

**Part IV – Upscale hotels in Portugal (in general, not just about your last upscale hotel stay)**

1. How frequently do you stay in an upscale hotel?  Once a year;  Twice a year;  Three or more times a year.
2. Are you satisfied with the technologies that you found in upscale hotels, in Portugal?  Yes;  
 No
3. Do you think that available technologies, in Portuguese upscale hotels, have a positive impact on your experience?
- Yes, but I would like to change some of them by new technologies to have a better/different experience.  
 Yes, but I would like to add new technologies to have a better/different experience.  
 Yes. the available technologies were enough to provide me a good experience. I would not change or add anything.  
 No, I need new technologies, more advanced; the available ones not had a positive impact on my experience.  
 Not at all, the available technologies had a negative impact on my experience, they were very outdated.

## Appendix III - Tables

**Table III 1 - List of the twenty-five hotels with technologies analyzed**

<b>Group - Pestana Hotels &amp; Resorts</b>	
Pestana Palace Lisboa*****	
Pestana Alvor Praia*****	
Pestana Vila Sol - Vilamoura*****	
Pestana Carlton Madeira*****	
Pestana Colombos Madeira*****	
<b>Group - Tivoli Hotels &amp; Resorts</b>	
Tivoli Lisboa*****	
Tivoli Victoria - Vilamoura*****	
Tivoli Palace de Seteais*****	
Tivoli Marina de Vilamoura*****	
Tivoli Jardim*****	
<b>Group - Vila Galé Hotels</b>	
Vila Galé Collection Palácio dos Arcos*****	
Vila Galé Ópera*****	
Vila Galé Ericeira*****	
Vila Galé Douro*****	
Vila Galé Ampalius - Vilamoura*****	
<b>Group - Accor Hotels (Sofitel, Novotel and Mercure)<sup>32</sup></b>	
Sofitel Lisbon Liberdade*****	
Novotel Lisboa*****	
Novotel Porto Gaia*****	
Mercure Lisboa Hotel*****	
Mercure Figueira da Foz Hotel*****	

**Table III 2 - Guests' company & purpose of travel**

		In your last upscale hotel stay, in Portugal, did you travel:									
		Alone		With friends		As a couple		With family		Other	
		N	%	N	%	N	%	N	%	N	%
What was the main purpose of your trip in your last stayed in a Portuguese upscale hotel?	Leisure	2	5.0%	33	<b>62.3%</b>	97	<b>83.6%</b>	75	<b>91.5%</b>	1	5.3%
	Business	35	<b>87.5%</b>	4	7.5%	10	8.6%	2	2.4%	12	63.2%
	Leisure and Business	3	7.5%	14	26.4%	7	6.0%	3	3.7%	4	21.1%
	Other	0	0.0%	2	3.8%	2	1.7%	2	2.4%	2	10.5%

<sup>32</sup> Ibis hotels also belong to Accor group ,but cannot be considered for this analysis because the hotels do not have 4 or 5 stars

**Table III 3 - Frequency of respondents in Portuguese upscale hotels**

	<b>Frequency</b>	<b>N</b>	<b>%</b>
How frequently do you stay in an upscale hotel?	Once a year;	123	39.7%
	Twice a year;	110	35.5%
	Three or more times a year.	77	24.8%