

Acceptance of New Technologies in Hotel Rooms

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Abstract

New Technologies are heavily breaking into the hotel industry. This survey focuses its attention towards the technological changes in the accommodation sector. The main attention was placed on the evaluation of new technologies for future hotel rooms. The acceptance of new technology was surveyed by qualitative and quantitative empirical research methods. The main results of this study and a further approach are described in this article.

Keywords: Accommodation, hotel rooms, hotel services

1 Introduction

The usage of new technologies (esp. ICT) in the office sector and at home has become standard. In the tourism industry the same progress is expected. The implementation of modern technologies can simplify operating processes and make them more (cost) effective. Also, additional features like internet in hotel rooms have become necessary to fulfil the guests' expectations. The hotel sector, and here esp. the accommodation part, is a very little-investigated field in e-tourism, although the hoteliers start to realize the importance of further development in this area. Main focus for hotels and destinations till now was more on the online booking side, while the stay and its support of the guest is an underdeveloped research field in eTourism. Hence, the main theme of the last ÖHV symposium in 2005 was "The Future Hotel Room".

The project concerning the utilization of new technologies in the tourism industry is called "Smart Hotel Room". The aim is to develop solutions for the Austrian hotel industry and to evaluate the acceptance of these solutions in their daily use. Guests and hotel owners often have different preferences and expectations when it comes to the importance of offering new technologies. Furthermore, frequently there is a gap between what the hotel owners believe that the guests want and their actual needs. Therefore, the acceptance of new technologies was evaluated in several ways. For the acceptance of new technologies in hotel rooms, an online survey and additional expert interviews have been conducted. This paper gives an overview of the project outcome, including the main results of the survey and future prospects.

2 Smart Hotel Room

Applying new technologies in hotels offer a chance for creative and personalized guest care. The potential of new applications is explored and empirically evaluated in the "Smart Hotel Room" project. Therefore, hotel guests and hotel experts were interviewed to analyze the possibilities and the potential of implementing new technologies in hotel rooms. Thus, comparing hotels with home and office seems to be a useful approach.

There are several research initiatives dealing with smart future homes or offices, e.g. T-Com Haus, HomeLab (Philips), InHaus (Fraunhofer) or the Future Home (Telekom Austria). In the European Union, two research institutions should be mentioned: "Towards the era of personal service at home and everywhere" - in short ePerSpace - and ISTAG (ISTAG, 2004). Both are supported by the European Union and focus on new challenges of the use of ICTs. In the USA the MIT advises the Oxygen project. Human-centred computation is the main issue of this project - *'it will enter the human world, handling our goals and needs and helping us to do more by doing less.'* (MIT, 2002) These projects are concerned with the research on Ambient Intelligence or Ubiquitous Computing and its implementation in smart homes or offices. According to the

ISTAG the term Ambient Intelligence covers the convergence of three technologies: Ubiquitous Computing, Ubiquitous Communication, and Intelligent User Friendly Interfaces (ISTAG, 2004).

A few of those areas also apply to hotel rooms or the whole travel chain. If a guest has a smart home why shouldn't he have a smart hotel room? The first part of the project was to analyze existing options of personalization and to evaluate relevant features for an application in hotel rooms.

For the classification of personalized features the hotel room was split into four areas, based on practical considerations: **Ambience, Infotainment, Identification and Security and Services**

2.1 Ambience

The ambience of a hotel room includes the **climate** (heating, air conditioning and ventilation), the **lighting** of the room, **colors** and the use of **flavors**. In a smart hotel room, these features are personalized on the basis of **guest preferences**. Therefore, an efficient CRM system will be absolutely necessary. Personalized features make no sense without having information about guest preferences. It is completely useless, adding vanilla scent to the room, applying dimmed light and arranging a warm room temperature without knowing if this fits the guest's preferences. In the worst case, he will not come again if he does not like this kind of atmosphere.

Another point is the **interior** of the room. Probably the most important item of a hotel room is the bed. After all, the overnight stay is the core product of the accommodation business. Guests are often unsatisfied with sleeping accommodations in hotel rooms. One finds the mattress too hard, for other guests it is too soft. An individual adjustment of the mattress is a perfect solution. Some manufactures already offer electronic products for this purpose.

For business tourists, the **furniture** of the hotel room is also an important issue, as they often have to work in the hotel room. Therefore, adequate equipment is needed. Smart desktops which can be converted into a workstation fulfill this requirement. Hence, it is important to know about the different target groups and their individual needs. A high demand will be on versatile furniture. For example, a moveable mini bar would be a nice gadget for guests or an interactive mirror in the bathroom, which enables watching TV or gives information (e.g. own weight or hotel- and destination information). Figure 3 demonstrates some possibilities concerning the interior of future hotel rooms.

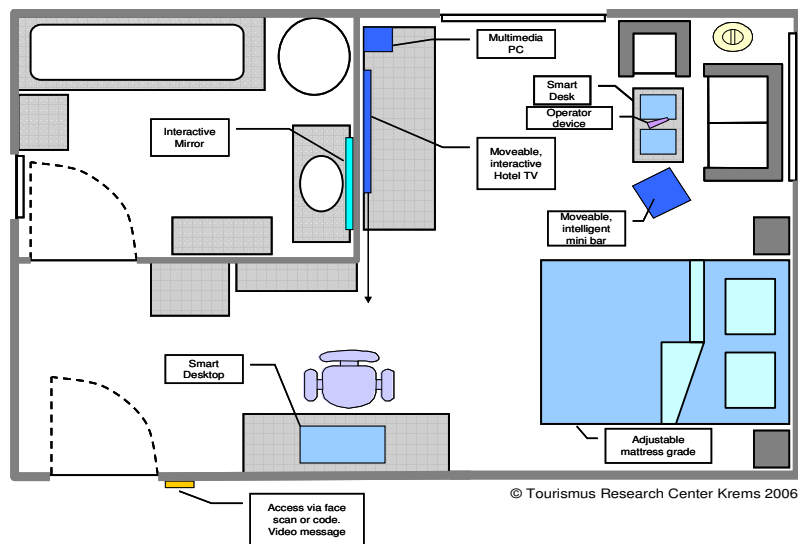


Fig. 1. Furnishing of future hotel rooms

2.2 Infotainment

Information is the most important good of the western society. “Information Society” is a new term for the post-industrialized society (Bell, 1973). Many current authors try to analyze this phenomenon and its effects (e.g. Ulrich Beck, Anthony Giddens, Jürgen Habermas, Richard Sennett). The term “infotainment” is used as its technical denotation, which stands for the connection of information and entertainment and its distribution over multi-media interfaces (MMI). In another context, the term is used as a critic notation for the entertaining mediation of education content. It is affected by the media critic Neil Postman. TV transforms every topic into entertainment; no matter if it is about politics, culture or education (Postman, 1985).

The access to information is a natural good in the western society. Guests expect this also in hotels. According to the actual study “Battling for Broadband: Broadband in the Hospitality Industry” by in-Stat (www.instat.com), the usage of broadband internet access in hotels will increase from 14,300 properties in 2004 to nearly 54,000 properties in 2009. Internet access has become a standard offer in bigger hotels, but guests often have difficulties using this feature. Particularly in the past, it was a great challenge to make the service work (Abramson, 2001). Easy plug-ins and play modes without long-winded access are required.

The new potential of TVs in guestrooms raises high expectations. *‘The advances are so great with regard to in-room entertainment that some equate the experience with the revolution from black and white to color television’* (Malley, 2004).

Travelers experience new sorts of TV at home and it is not surprising that guests expect this entertainment in hotel rooms as well. Modern in-room entertainment includes video on demand (VOD), music or audio on demand (MOD), video games, and enhanced services like reservations for the restaurant or spa treatments. In the US hotel industry, such features are very common and the European market is following.

Another important issue for business guests is video conferencing. The possibility to attend a video conference in the hotel room will be a special offer and easy to implement. In the future, not only business guests might demand these services; family members also benefit from video conferencing helping them staying in face-to-face contact with relatives at home.

2.3 Identification and Security

The access to hotel rooms completely changed over the last decades. Keys of modern hotels are able to do much more than just open the door. **Key cards** replaced traditional keys. In the beginning, this technical change was a big advantage for hoteliers. The administration of the rooms was simplified and often an energy-saving program was combined with the changeover. In many hotels it is common practice to activate the in-room power supply system with the key card. The standard system is based on magnetic stripe cards and requires a direct contact with the lock. New technologies without direct contact are already used. These access devices are based on **radio frequency (RF) technology**, which makes door opening much easier. RF sensors are very small, thus can be integrated in other devices like mobile phones or watches. Furthermore, data transfer based on RF technology is very fast (www.hotelmotel.com).

In order to avoid problems of magnetic cards like demagnetization, other modern technologies are in discussion. With **Bluetooth technology** the access to hotel rooms via mobile phone or PDA is possible. The great advantage of this technology is that the access code can be sent directly to the guest’s mobile phone immediately after booking and so the check-in would be possible at any time and much faster than before. Very innovative ideas deal with **biometric authentication** in hotel rooms.

Another benefit of new access devices is their multifunctional adoption. The access to other areas can be granted easily and the devices can be used as data storage medium. It is also common to use it for cashless

payments. However, all those mentioned advantages are confronted with **issues of confidentiality and privacy** and the abuse of it.

2.4 Services

Hotels often offer a variety of service goods (e.g. fitness, spa, cosmetic treatments). New interactive TV allows giving direct information about these services and making direct bookings or reservations. External services vendors like ticket sellers, car rentals or regional shops can promote and sell their products via hotel TV. A key development in the project is the creation of a dynamic, individualized guidebook. With this tool tourists can compile their own guidebook adapted to their needs and wishes, for example including favorite destinations, events and the current weather. Via interactive TV the dynamic guidebook can be produced directly in the hotel room. Afterwards, guests receive a paperback version at the reception.

2.5 Acceptance Evaluation

It is useless to implement a variety of products and services in guestrooms without checking the necessity. Part of the Smart Hotel Room project is to evaluate the guest's needs for new technologies in hotel rooms. Therefore, studies concerning technological acceptance provide a basis. Already in the early 1960s, Everett Rogers wrote about the acceptance of innovation (Rogers, 1962). According to his studies, every innovation passes through a process of acceptance. People can be divided into five groups according to the acceptance of innovations: **Innovators, Early Adopters, Early Majority, Late Majority and Laggards**.

A research design was constructed according to other research about technological acceptance like Spiekermann and Rothensee, which are concentrated on social and psychological determination factors of ubiquitous computing (Spiekermann & Rothensee, 2005),.

An **online questionnaire** was composed for the first data collection. In fact, this method is not without controversy, because with this way only a particular target group can be reached – the internet users. But to gain a first impression it is an adequate method, plus this population segment can be viewed as a rather open-minded group. The results are not representative for all of the Austrian hotel guests, but it is assumed however that the sample is representative in some cases. For instance, the results of the travel habits are identical with surveys from Statistik Austria concerning tourism. The results are a good base for further research and development concerning future hotel rooms. 212 people responded to the questionnaire and only one person did not finish the questionnaire, so the sample included 211 valid results.

In addition to the quantitative collection of dates, **interviews with hotel experts** from different Austrian hotels were conducted. These interviews were evaluated by the method of qualitative analysis.

2.6 Results and Future Prospects

As already mentioned, the survey will give an impression about the guest requirements for future hotel room equipment and services. The participants evaluated single products and services with the possible statements: "absolutely necessary, desired, imaginable in the future and no need". Most subjects rated adjustable temperature and internet access in the hotel room very high. Besides that the most equipment asked for are adjustable mattresses, Smart Cards and improved lighting. Concerning the services provided via an interactive television in the hotel room, the subjects show great interest but do not consider these services as absolutely necessary.

One part of the analysis was to show differences between various target groups. Obviously, the requirements of business tourists differ from regular holiday and leisure tourists. The surveys prove that business tourists have a higher demand on internet access, multifunctional furniture or video conferencing. The evaluation included the influence of sex, age, occupation or travel habits on technological acceptance. Therefore the

subjects of the questionnaire were partitioned into the categories based on Roger's Diffusion Model. The subjects had to answer several questions concerning their attitude towards new technologies and their usage. A positive, significant influence of the variable *technology affinity* concerning the acceptance of new technologies in hotel rooms was found. Table 2 shows the results of a one-way analysis of variance with the dependent variable *infotainment* and the independent variable *technology affinity*. Innovators have the lowest value and for that reason the highest level of acceptance.

Means with the same character are significantly different.				
Duncan groups		Mean	F	T_Affinity
	A	13.800	5	Laggards
B	A	13.023	43	Late Majority
B	C	11.350	80	Early Majority
	C	10.600	50	Early Adopters
	D	8.400	5	Innovators

Table 1 Infotainment

One problem for hoteliers is that they have to address several target groups with different needs, but they cannot focus on guests categorized as Innovators or Early Adopters. The target group may be too small to survive in the very competitive hotel market. Thus the challenge is to offer a degree of innovation which fits to the majority of guests. The utterances of the experts confirmed this thesis. Another important aspect is to ease the usage of ICT equipment in guest rooms. It is of no use to implement high technology in hotel rooms at possible high costs and only a small group of guests is able to handle it. To support the hotel industry in this TRC Krems will also focus on this aspect in the "Smart Hotel Room" project. Hoteliers emphasize that technology can not substitute bad service (Wilson, 2006) and Austrian hoteliers are a little bit conservative in adopting new technologies. But there is an increasing interest in using the television as additional information and promotion system. Also, the importance of a proper internet-access is seen. Mainly new constructed hotels are well equipped with additional features. In older buildings, the adaptation of new technical standards is big challenge, and this concerns many Austrian city hotels.

In conclusion it has to be mentioned that the described project is only the start of a combination of theoretical and practical research in the field of new technologies in the tourism sector. An ongoing evaluation of necessities and an adequate adaptation of processes are required to improve standards and services. Therefore Krems Research established the **Future HotelroomLab**. In this laboratory different providers of hotel products can evaluate their products in a realistic environment with real guests from different target groups. The goal is to find out new insights about the acceptance and usability of different hotel products and services. This will help to improve the products offering and finally lead to a higher guest satisfaction.

3 References

- Abramson, R. (2001): Room Service Providers - Industry Trend or Event. In: The Industry Standard, 23. April 2001.
 Bell, D. (1973): The coming of post-industrial society. A venture in social forecasting. New York, NY: Basic Books
 ISTAG (2004): Grand Challenge in the Evolution of the Information Society. Luxembourg. ISTAG.
 Malley, M. (2004): The revolution to the digital room has begun. In: Hotel & Motel Management, 19. July 2004.
 MIT (2002): Pervasive, Human-centered Computing. MIT Project Oxygen.
 Postman, N. (1985): Amusing Ourselves to Death: Public Discourse in the Age of Show Business. Penguin USA.
 Rogers, E. M. (1962): Diffusion of Innovations. New York.
 Spiekermann, S. & Rothensee, M. (2005). Soziale und psychologische Bestimmungsfaktoren des Ubiquitous Computing. <http://interval.hu-berlin.de/downloads/rfid/neuste%20forschungsergebnisse/SocioPsychofak.pdf>, 10.01.2006