Food Waste Management: Does information technology matter in food waste?

Summary

Casa Basalto is an affordable luxury sustainable hotel located in Pachuca in the state of Hidalgo, Mexico. The hotel hosts Dolina, a traditional Mexican cuisine restaurant that follows the hotel's green practices. With this case study, students are introduced to an example of green practices in the hospitality industry, and to some models of technology acceptance and the importance of information technology based systems (ITBS). General information about the infrastructure of the hotel and restaurant is provided to familiarize students with the core business concepts of the establishment featured in the case study. In addition, the administrative bodies are explained, and the food waste issue is introduced. The main source of waste for this property is food (approximately 60% of their total waste production). The board of directors is very concerned about this issue; they are worried about the congruence of their brand with sustainability and the possible hidden costs related to sustainability. The general manager of the property has been asked to find a solution to this problem. Introduction of an ITBS called Leanpath is proposed to prevent and manage food waste, but the board of directors is not convinced. They hire a student as a consultant to further research this issue and propose solutions by making a presentation to the board and submitting a brief summary of their findings to the stakeholders' assembly.

Target Audience

This case study can be used in various undergraduate as well as in graduate level courses, such as food service management, hospitality information technology, and marketing. It is appropriate for undergraduate level to introduce students to green practices in the hospitality industry, ITBS, models of technology acceptance and their importance in the hospitality industry. At a graduate level, it helps students research and analyze different characteristics of systems and models and discuss the importance of incorporating these systems into real life projects.

Teaching Objectives

This case study presents students with theoretical models of technology adoption in the hospitality industry, the implementation of ITBS, food waste awareness and solving real life issues that affect the hospitality industry.

By the end of this lesson, students should be able to:
- Analyze the advantages and disadvantages of incorporating an ITBS that helps to reduce food waste in the hospitality industry.
- Analyze issues related to adoption of new technology in the hospitality industry.
- Evaluate approaches to food waste management.
- Evaluate how best to design and present research findings to governing bodies of a corporation.
- Compare and contrast the implications of their findings with those of their peers.

Suggested Teaching Strategy

This case study can be taught in a variety of ways. For example, if time permits, one separate class could be utilized to address the theoretical implications of ITBS, and two models of technology acceptance (technology acceptance model and unified theory of acceptance and use of technology) could be used. The following class could be allocated for student presentations. Alternatively, one class period could address both topics and presentations. This class plan is designed to be taught with a minimum requirement of 90 minutes; however, instructors can make modifications as required based on the time available in their course.

Prior to the lesson

Prior to the lesson, students will be asked to read this case study, along with additional readings on IBTS, food waste solutions, and models of technology acceptance (TAM and UTAUT). Students will also be required to have a general understanding and be able to discuss the following topics:
- Food waste
- Green practices
- Information technology based system (ITBS)
- Technology acceptance model (TAM),
- Unified theory of acceptance and use of technology (UTAUT).

Students will be asked to form small groups of four people, if the class is large enough, so they can learn from each other and discuss. Each group will be required to research and create a presentation that will be delivered to the board of directors and write a brief summary of their findings, which will be given to the shareholders' assembly.

During the lesson

At the beginning of the class, it is suggested that students are asked to give a brief summary of the case study. The course instructor may present the abstract of this case study to provide a general view of the actual situation. (15 minutes)

After understanding the case study, students will be asked to make their presentations to the class. It is suggested that the instructor should take on the role of the president of the board of directors. (45 minutes)

Following the students' presentations, the instructor should decide

which team or student made the best presentation. After announcing the winning team, the instructor should conclude the case study by emphasizing the importance of addressing food waste and highlight the benefits of ITBS and the main issues concerning any model of technology acceptance in the hospitality industry. (30 minutes)

After the lesson

Students will be asked to post a brief summary of their findings that was supposed to be given to the shareholders' assembly on the course e-learning management system. They will also be asked to read and comment on at least two other proposals posted by their peers, in order to create further discussions and clarify concepts that were not fully understood at the beginning of this case study.

Theoretical Framework

It is suggested that Chan et al. (2018) be used as a framework for barriers to technology adoption for sustainability. This is a study of potential barriers to the adoption of environmental technologies in Hong Kong hotels. Using data collected via in-depth, semi-structured interviews with senior hotel professionals including general managers, financial controllers, directors of the engineering department, and environmental management system managers, they found that these barriers can be grouped into three categories: (1) product-related barriers, (2) external barriers, and (3) internal barriers.

Applying this framework to this case study, the technology adoption barriers may be categorized into the following categories.

1. *Product-related barriers*

The cost of the technology is the first barrier to adoption. High costs for new technologies exemplify a significant entrance barrier to adopting a new technology. Another product-related barrier is the high maintenance costs of adopting this system. Weights will need to be maintained throughout the year, since accuracy is paramount. At the same time, food and liquids will need to be carefully used so as not to affect the electronic components of the hardware. The immaturity of the technology is also an important factor. Since this technology only recently went on the market, some managers will opt to wait until other versions of the system are created.

Another product-related barrier may be the unreliability of the system. Some managers might believe that the system is not reliable because, as a new solution, it may suddenly break down and no information about system stability is available for this technology. Long return on investment rates are also determined as a product-related barrier. Some technologies need a long period of time before there is a return on investment; therefore, decision-makers would not opt for implementation of the system. Finally, possible risks of adoption need to be assessed in order to decide whether to implement this new technology. For example, employees may reject its implementation.

2. *External barriers*

The lack of professional advice is one of the most important external barriers. Since the proposal for the system comes from the general manager of the property, she might not be aware of all the pros and cons of this technology or other possible solutions to address the issue.

The lack of scientific data to evaluate applicability is another important barrier. Food waste in the hospitality industry is under-researched, with most studies approaching the issue from a sustainable agriculture and environmental approach, rather than managerial approach (Filimonau & De Coteau, 2019). Therefore, this can be a highly important barrier.

Inconveniences caused by governments may be seen as one of the barriers to the adoption of environmental technologies in this case. Installing this technology could require a change to the building structure, and obtaining a permit for this can be a lengthy process. Another example is the lack of knowledge transfer from suppliers. It will be necessary to match the restaurant's suppliers with the new technology, and some issues may appear when this is not possible.

The board of directors and the shareholders' assembly are also external barriers to implementing this new technology in this case since they decide whether or not to use it. Finally, the lack of fit to the existing systems, such as the POS and inventory management, may be another external barrier to adopting this technology.

3. *Internal barriers*

One of the most important internal barriers is the lack of internal leadership to prove the benefits of this technology. Leaders need to be the ones who first prove the success of the technology, so that employees see the benefits and want to use it. Another internal barrier could be the company's corporate culture; however, in this case the hotel and restaurant are based on sustainability so it might not be an important barrier. Physical limitation could be another internal barrier. Since the hotel and restaurant are already built, there may not be enough space for this technology. In addition, its installation may be costly due to physical limitations. Lengthy planning and approval processes are another internal barrier in this case. As stated in the case study, any decision needs first to be approved by the board of directors, and then presented to the shareholders' assembly in order to make a decision. The lack of capital budgets and resources could be another internal barrier. Since the general manager is asking for the total cost of the implementation of this technology, the president of the board of directors and the shareholders' assembly will need to assess the financial viability of the project.

Lack of performance measures is also important. Since the hotel does not have any specific measurement of food waste, it will be difficult to measure the benefits of this new technology.

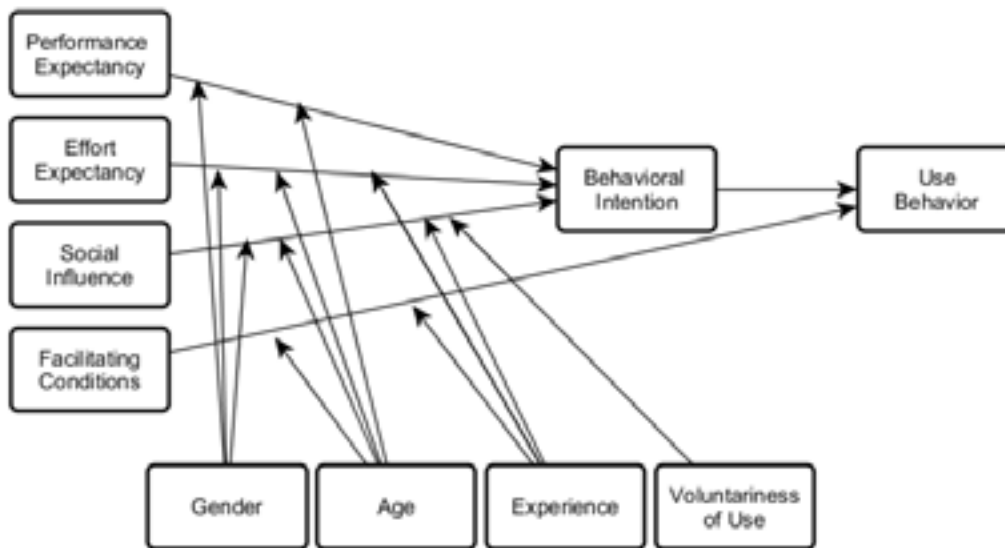The influence on daily operations could be another barrier. This

Figure 1

Model of Technology Acceptance
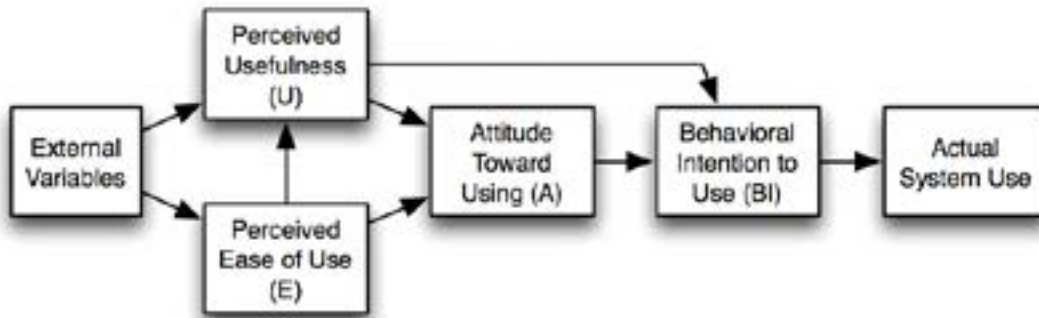
Source: Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3): 319–340.

Figure 2

Unified Theory of Acceptance and Use of Technology

Source: Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3): 425–478.

could include an increased staff workload and negative effects on the hotel's existing systems, appearance and customer service.

Finally, a lack of staff involvement is one of the most important barriers that could affect the implementation of this new technology. For further reading, refer to Goh and Jie (2019).

In addition to analyzing barriers to technology adoption, theories of technology acceptance may be useful for analyzing the case from the perspective of evaluating employee acceptance of the new technology. In this case, we suggest using the TAM (Davis, 1989). This model is an information systems theory that predicts how users accept and use technology. The model proposes that when an individual is presented

with a new technology, some factors might influence their decision about how and when they will use it. There are two main factors: perceived usefulness and perceived ease of use. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320), while perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320). See Figure 1 for Davis's (1989) proposed model.

In addition to TAM, UTAUT can be useful to analyze this case study. This model is based on the constructs of eight models that previously researched information systems behavior. It aims to explain

user intentions to use an information system and subsequent usage behavior. The theory suggests that there are four key constructs directly and indirectly predicting behavioral intention and actual use of technology: 1) performance expectancy, 2) effort expectancy, 3) social influence, and 4) facilitating conditions. The first three constructs are directly related to behavioral intention, and the fourth is directly related to the use behavior. The authors used age, gender, experience and voluntariness of use to moderate these relationships (Venkatesh et al., 2003). See Figure 2 for Venkatesh et al.'s (2003) proposed

Additional Readings

Chan, E. S. W., Okumus, F., & Chan, W. (2018). Barriers to Environmental Technology Adoption in Hotels. Journal of Hospitality & Tourism Research, 42(5): 829–852.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3): 319–340.

Goh, E., & Jie, F. (2019). To waste or not to waste: Exploring motivational factors of generation Z hospitality employees towards food wastage in the hospitality industry. International Journal of Hospitality Management, 80: 126–135

Lam, T., Cho, V., & Qu, H. (2007). A study of hotel employee behavioral intentions towards adoption of information technology. International Journal of Hospitality Management, 26(1): 49–65.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3): 425–478.

References

Chan, E. S. W., Okumus, F., & Chan, W. (2018). Barriers to environmental technology adoption in hotels. Journal of Hospitality & Tourism Research, 42(5): 829–852.

Davis, F. D. (1989). Perceived Usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3): 319–340.

Filimonau, V., & De Coteau, D. A. (2019). Food waste management in hospitality operations: A critical review. Tourism Management, 71: 234–245.