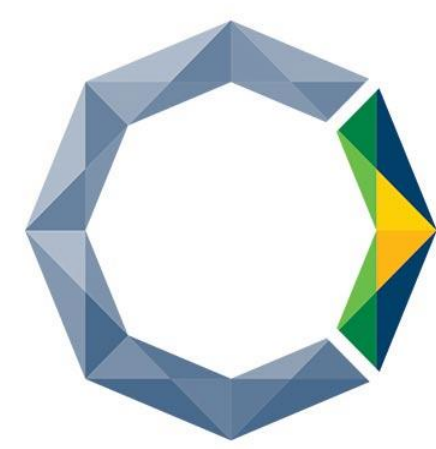


Robots In Hotels: Are they worth the investment?



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Abstract With technology advances growing exponentially, society continues to integrate robots into all avenues of life. This study investigates the hotel industry and aims to advise hotels whether or not it is worth it for them to invest, integrate, or continue, day to day operations with the assistance of hospitality robots. This work researched various types of robots, as well as different technology company brands and their respective price-points and their effect in creating loyal customers, new customers, and positively affect employee satisfaction. This research uses a mix of news articles, survey analysis, literature findings, and insight from current hotel operations managers whose property utilizes robots.

Literature Research

Comparisons of Current Robots in Hospitality

There are primarily seven robots that are used in the hospitality industry. These robots' design includes delivery and room service, bartending, housekeeping, concierge, front desk, security monitoring, and luggage transportation. Some robots such as Maidbot, a housekeeping robot are for directly helping hotels with menial tasks while other robots such as bartending robots are more for pleasure, marketing, and entertainment. The most common robot found in hotels in America are room service and delivery robots.

Robot	Type/Function	Cost
Relay by Savioke	Room Service & Butler	\$24,000/year
Tipsy Robot	Bartender	\$115,000 Purchase
Maidbot	Housekeeping Assistant (Vacuuming)	\$7,028/year
Pepper the Humanoid by Softbank	Lobby Ambassador & Information System	\$3243/year (first 3 years)
Knightscope	Security Monitoring	\$78,840/year
TUG by Aethon	Luggage Transportation	\$24,000/year

Robot Classifications

All robots can be classified based on two categories: utilitarian or hedonic values (Wu, Lu, 2013). Utilitarian values are those that provide usefulness and aim to bring ease to the user (Park, 2006). Hedonic values are utilized for entertainment and have proved to bring more enjoyment (Njati, Moghaddam, 2013). For example, bartending and front desk robots highlight more hedonic values while luggage transportation and housekeeping robots focus more on utilitarian values. However, some robots are for both. (Ryu, Han, Jang, 2010). For example, Relay the delivery and room service robot. While its utilitarian design is to deliver food or items to guests' rooms, its cute design and unique approach adds hedonic values to the experience.

There are several factors that influence how human users classify whether a robot is utilitarian or hedonic. These factors include the designated purpose of the robot, or the expected classification (Lee, Shin, & Sundar, 2011). While some robots are designed to have human attributes physically for hedonic value, their purpose is designed with utilitarian values. The more a robot has human characteristics or behaviors that humans associate with things we are comfortable with, such as animals, the higher the anthropomorphism we associate with the robot. We also inherently project or impose our interpretation on their actions similar to how we perceive a pet's behavior (Duffy, 2003). The more anthropomorphism a humanoid robot has, results with higher acceptance rates in a hospitality and tourism service (Murphy, Gretzel, Pesonen, 2019). Anthropomorphism is the residue of assumptions about humans applied to other things; an involuntary perceptual strategy unconsciously made from ambiguous humanlike forms (Guthrie, 1997).

With the continued rise of popularity in use of robots, it is common to find them in our everyday lives. Whether it be at the mall for security, entertainment for children at airports, or a free-roaming device in your neighbor's home the vacuums. Each party utilizing robots have different motivations and goals they aim to reach, though what truly defines the robot as hedonic or utilitarian is the enjoyment experienced in the use. Due to limited research in robots in the hospitality literature, important questions emerge:

- **Are the investments and costs of having robots used in hotels worth the investment?**
- **Are robots in hotels used more for function or marketing?**

Conclusion & Recommendation

While robots provide a wide variety of select services to hotels, there was no correlation found between the offering of robot services and revenue income to hotels. According to the survey results, the thousands of dollars required to invest in the implementation and utilization of robots in hotels is not worthwhile. However, there is an entirely new avenue of marketing through the novelty that is still surrounds them. Hotels are being tagged and indirectly advertised to the network of guests who stay and share on social media. This was seen at both properties where managers were interviewed where the robots' hedonic values were valued highly. In conclusion, hospitality robots are not worth the investments and costs and robots in hotels are used more for function with the secondary benefit of marketing through guests. I would recommend hotels that are financially strong to invest in hospitality robots for their function that positively impacts employee satisfaction, and the marketing of their property.

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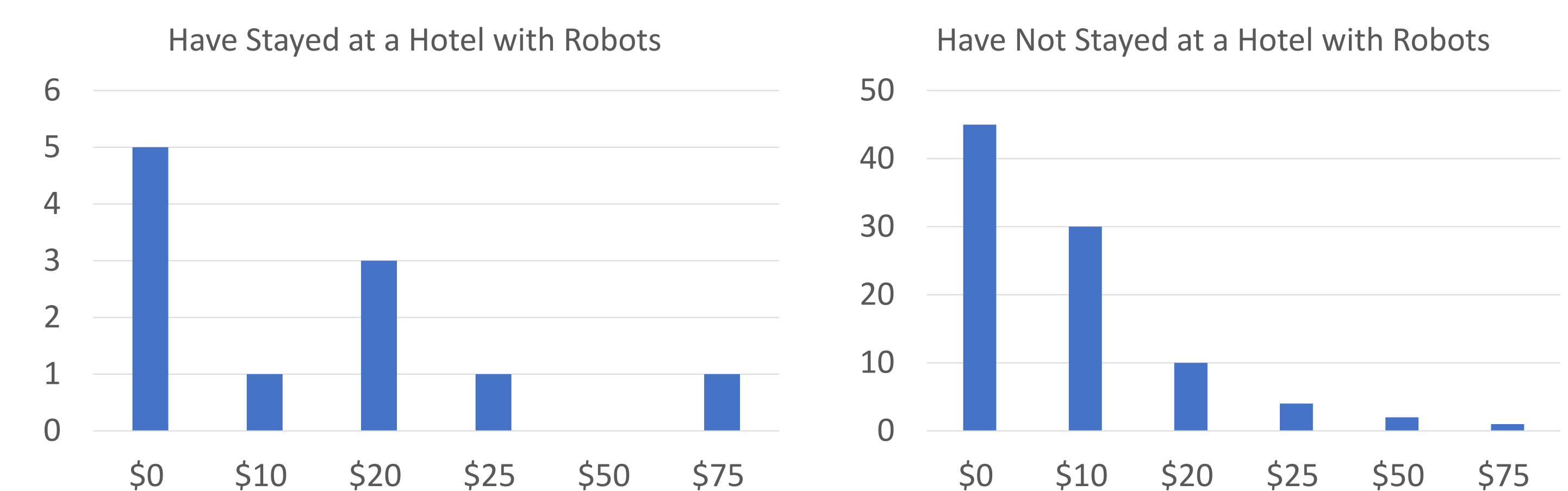
Research

Survey Results

This survey asked current college students their opinions, preference, and experience within hospitality robots specifically at hotels. The opinions gathered are those of students who will be entering the workforce in the next 4-6 years and can give us a look into the upcoming generation of business professionals and guests. 106 students were surveyed and around 90% of those asked have not stayed at a hotel that utilizes robots yet.

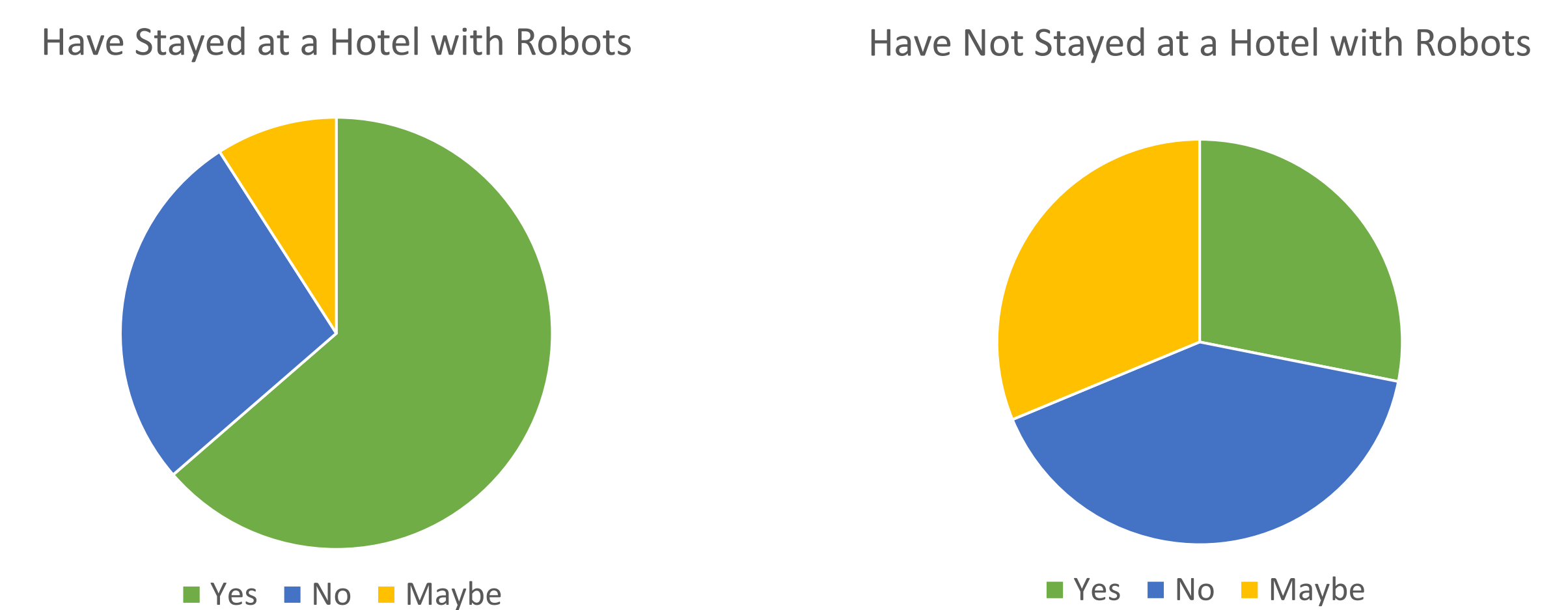
How much more would you pay to stay at a hotel that has robots compared to similar hotels in the area without robots?

The students that have experienced hospitality robots during a hotel stay before had varying price points in which they would pay. 45.5% of these students would not pay more to stay at a hotel with hospitality robots compared to without. This is interestingly similar to the opinions of the students who have not experienced hospitality robots. 48.9% of these students would not pay extra, and 32.6% other students would only pay an extra \$10.



Do you view robots as an amenity?

The students that have experienced hospitality robots during a hotel stay before double in seeing robots as an amenity compared to the students who have not. 63.6% of students who have experienced hospitality robots see them as an amenity while only 28.1% of those who have not had that experience, feel the same way. This alludes to my finding that students who have experienced and utilized a hospitality robot during their hotel stay views the availability of robots, in a higher view.



Discussion

Overall, students fail to see a financial value from the use of robots in hotels. In both questions, students who have experienced the services at a hotel that utilizes robots have a higher view on both the value, and service the robots perform. While students may not be making their lodging selection based on the amenities provided, there is a high chance they will have the opportunity to experience one in the future. Once the interactions are had, it is possible that their appreciation and positivity towards robots will also increase.

Operations Manager of the Courtyard by Marriott Anaheim Theme Park Entrance Anaheim, CA Bryan, Schinski:

Q: How was the idea of buying a robot brainstormed, and how did you and the team pick Pepper as your robot?

A: Our hotel owner, Mr. Edmanson, has always wanted to own a hotel with a robot. His heart behind it is knowing that hotels are often where kids have their first experiences. Whether it be a pool, computer, or Disneyland, they will remember their experience for the rest of their life. By having Pepper in our lobby, we have the opportunity to expose all guests to technology conveniently during their stay!

Q: What was Pepper's effect on guest satisfaction surveys?

A: There has been a consistent 5-point (on a 100-point system) increase. She is helpful, entertaining, and interesting to all!

Night Auditor & Overnight Manager of the Sheraton San Gabriel Valley San Gabriel, CA Vincent Weng:

Q: Does your hotel primarily use the robots for function or marketing?

A: There are four different types of robots implemented that are used for luggage assistance, in-room dining delivery, way finder, and housekeeping. While each serve their function, guests love to take pictures and film the robots to share on social media.

Q: What are the positive effects that the robots have had on your property?

A: Employees have positive feedback to [our] robots. We have many guests share their positive comments regarding using the robot services on surveys and social media.

Discussion

While the robots have had positive effects on both guests and employees, both hotels chose to implement robots at their properties for the functionality. However, both expected and received the added marketing bonuses from their guests sharing on social media and local news articles, which highlights hedonic values.