**Hotels**

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MTH 410: Quantitative Business Analysis

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**Introduction**

A1 Hotels delivers a luxurious hotel experience to its customers around the globe. Due to some uncomplimentary incidents in the news however, A1 Hotels is reexamining the quality of service it provides. As a result, guests have received a customer satisfaction survey to rate the quality of their stay. The survey gathered ratings on quality of room, food, and service, rated as either Good(G) or Poor(P) with (P) indicating a dissatisfied customer. Historically, 40% of A1 Hotels customers have been dissatisfied with the hotel quality. The company would like to know if the recent level of customer satisfaction has changed. From the survey, 200 responses were randomly selected for analysis.

**Responses**

Overall, 42% of customers were recently dissatisfied with A1 Hotels. When inspected by categories Room Quality, Food Quality, and Service Quality, customers rated them as Poor(P) 21%, 23.5%, and 27% of the time, respectively. We can utilize a relative frequency distribution or bar graph (see Figure 1) to perceive the differences more clearly in categories (Holmes et al., 2018). In subsequent surveys, A1 Hotels should investigate why Service Quality was rated 3.5-6.0% higher than the other categories.

Figure 1

*A1 Hotels Survey Responses Rated Poor(P)*

![Chart, bar chart

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**Confidence Intervals**

Using a 92% confidence interval we can provide an interval estimate of the sample proportions. Recent clients were dissatisfied between 35.89% and 48.11% overall with a margin of error of 6.11%. The point estimate for the population proportion is near 42.12%. If we want to gain more precision, we can decrease the margin of error by lowering the confidence level, but this of course comes at the cost of our confidence in the estimate (Holmes et al., 2018). Dissatisfaction in quality by room, food, and service produced intervals of 15.9% - 26.1%, 18.3% - 28.7%, 21.51% - 32.49%, with margin of errors of 5.1%, 5.2%, and 5.5%. The confidence interval tells us at most 48.11% of A1 Hotels customers were dissatisfied with hotel quality with a potential 32.49% disappointed in the service quality.

**Hypothesis Tests**

To ascertain if the proportion of all recent clients is more dissatisfied than the traditional level of dissatisfaction, we can conduct a hypothesis test. The *p*-value approach to the test, with the *p*-value representing the probability of finding an outcome at least as great as the observed outcome given a true null hypothesis, is evaluated by the *p*-value being less than or greater than the level of significance, α = 0.08. The significance level denotes an 8% risk of rejecting the null hypothesis if it is true. If we use a lower level, the test will have a decreased probability of noticing a difference in customer satisfaction if one exists (Holmes et al., 2018). The hypotheses for the two-tailed test are *H*0: *p* = 0.40 and *Ha*: *p* ≠ 0.40. First we calculate the test statistic (see Figure 2) where the sample proportion of successes, p’, is 0.42, p0, the hypothesized value, is 0.40, q0, the value not hypothesized, is (1 - p0), and n is the sample size of 200 which results in 0.578.

Figure 2

*Test Statistic Formula*

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The *p*-value is the sum of the two tail areas under the standard normal distribution where *p*-value = P(Z < 0.578) + P(Z > 0.578). Since the *p*-value is greater than the level of significance (0.563264 > 0.08), we fail to reject the null hypothesis. Another approach to the hypothesis test is using the critical value which defines the upper and lower bounds of a confidence interval and decides the threshold of significance. For a 92% confidence interval, we use a critical value of 1.75. Ultimately the test statistic, 0.578, is not less than -1.75 nor greater than 1.75. With the test statistic outside of the critical region, we fail to reject the null hypothesis. Both approaches demonstrate there is not strong enough evidence that the recent level of customer satisfaction differs from 40%. Although A1 Hotels’ recent customers do not indicate a change in their total level of dissatisfaction, the company should examine why certain features of the hotel experience dissatisfied customers more than others.

**Conclusion**

A1 Hotels should make a greater effort to understand why their customers express dissatisfaction with their hotel experience. Overall satisfaction has not significantly changed, but the hotel needs to gain insight into why their service quality is rated Poor at larger frequencies than room and food quality. Taking steps during the design stage of future studies to improve the quality of feedback, for example by using carefully constructed open-ended questions (Decorte et al., 2019) or employing engaging, interactive formats like sorting objects by preference using online cards (Dolnicar et al., 2013) may yield a new approach to A1 Hotels’ service.

**References**

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