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# THE INFLUENCE OF DIGITAL TRANSFORMATION, EDUCATION, AND INNOVATION ON VISITOR SATISFACTION AT THE SULTAN SULAIMAN BADRUL ALAMSYAH MUSEUM IN TANJUNGPINANG CITY WITH SERVICE QUALITY AS AN INTERVENING VARIABLE

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**Abstract**

This research aims to analyze the influence of digital transformation, education, and innovation on visitor satisfaction at the Sultan Sulaiman Badrul Alamsyah Museum in Tanjungpinang, with service quality as an intervening variable. The study adopts a quantitative approach using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) analysis to test the relationships among the variables. Data were collected through questionnaires distributed to museum visitors, focusing on their perceptions of digital service implementation, educational programs, innovative initiatives, service quality, and overall satisfaction. The results indicate that digital transformation, education, and innovation have a positive and significant effect on visitor satisfaction, both directly and indirectly through service quality. Furthermore, service quality serves as a critical mediating factor that strengthens the impact of these variables on visitor satisfaction. The findings suggest that improving digital features, educational activities, and innovative services, supported by consistent quality standards, can significantly enhance the visitor experience and satisfaction. This research provides practical implications for museum management in adopting digital strategies and educational innovations to improve public engagement and competitiveness in the cultural tourism sector.

**Keywords:** ***Digital Transformation, Education, Innovation, Service Quality, Visitor Satisfaction, Museum Management.***

## INTRODUCTION

Museums serve as vital institutions for the preservation, education, and dissemination of cultural heritage. They play a significant role in strengthening historical awareness and cultural identity, while also contributing to tourism development and community education. In today's digital era, museums are challenged to adapt to rapid technological changes and evolving visitor expectations. The adoption of digital transformation in museum management is no longer optional but a necessity to improve accessibility, engagement, and overall visitor experience. The Sultan Sulaiman Badrul Alamsyah Museum, located in Tanjungpinang, is an important cultural institution that showcases the historical and cultural heritage of the Riau Archipelago. However, like many museums in Indonesia, it faces challenges in meeting modern visitor expectations due to limited digital facilities, conventional educational methods, and a lack of continuous innovation in service delivery. In the era of Industry 4.0 and digital tourism, visitors increasingly demand interactive experiences, digital access to information, and high-quality services. Consequently, the museum must implement effective strategies in digital transformation, educational programs, and service innovation to maintain relevance and enhance visitor satisfaction. Visitor satisfaction is a critical determinant of museum performance and sustainability. Satisfied visitors are more likely to return, recommend the museum to others, and contribute to positive word-of-mouth promotion. Several factors influence visitor satisfaction, including the quality of services provided, the effectiveness of educational activities, and the presence of innovative experiences. Service quality, in particular, acts as a key mediator that translates digital transformation and innovation efforts into meaningful visitor experiences. When digital initiatives and

educational programs are well-integrated with excellent service quality, they can significantly enhance visitor satisfaction and engagement Previous studies have shown that digital transformation positively influences visitor satisfaction by improving information accessibility, creating interactive content, and streamlining ticketing and service processes. Education also plays an essential role in enriching visitor experiences through well-designed learning programs that deepen cultural understanding and engagement. Furthermore, innovation in museum services such as the use of augmented reality, virtual tours, and creative exhibitions has emerged as a powerful tool for attracting and retaining visitors in the competitive cultural tourism industry. However, the effectiveness of these strategies largely depends on the quality of services provided, including responsiveness, reliability, and staff competence in delivering digital and educational initiatives. Given the increasing importance of digitalization, education, and innovation in shaping visitor experiences, it is crucial to examine their combined impact on visitor satisfaction, with service quality serving as an intervening variable. This research aims to address this gap by analyzing the relationships among these factors within the context of the Sultan Sulaiman Badrul Alamsyah Museum. By doing so, the study provides valuable insights for museum managers and policymakers on how to leverage digital transformation, enhance educational content, and foster innovation to achieve higher levels of visitor satisfaction and competitiveness in the cultural tourism sector.

## LITERATURE REVIEW

### 1. Digital Transformation

Digital transformation refers to the integration of digital technologies into various aspects of an organization's operations to improve processes, enhance customer experiences, and create new value. In the context of museums, digital transformation involves adopting technologies such as virtual reality (VR), augmented reality (AR), digital ticketing systems, and interactive displays to provide visitors with immersive and engaging experiences. This transformation is crucial in responding to the evolving expectations of modern visitors, who seek convenience, personalization, and interactivity in their cultural experiences. Digital transformation in museums is not only about digitizing collections but also about rethinking operational strategies and customer engagement models. Effective digital initiatives can reduce barriers to access, improve information delivery, and allow for virtual participation in exhibitions. Studies have shown that digitalization enhances visitor satisfaction by making museum experiences more interactive, accessible, and engaging. Furthermore, it supports operational efficiency and transparency by simplifying administrative processes such as ticketing, membership management, and visitor feedback collection.

### 2. Education

Education is a core function of museums, enabling them to fulfill their role as institutions of knowledge and cultural preservation. Educational programs in museums range from guided tours and workshops to interactive learning experiences using digital media. These programs aim to deepen visitors' understanding of cultural heritage, history, and art while fostering lifelong learning. Effective educational initiatives not only provide information but also encourage critical thinking and cultural appreciation.

In the context of visitor satisfaction, educational programs contribute significantly to the perceived value of a museum visit. Visitors often expect museums to offer meaningful learning experiences that go beyond passive observation. By implementing well-structured educational activities, museums can enhance engagement, increase visitor retention, and promote positive word-of-mouth recommendations. Digital technology can further strengthen educational efforts by offering online learning platforms, virtual exhibitions, and multimedia content that cater to diverse learning preferences.

### 3. Innovation

Innovation in museums refers to the introduction of new ideas, methods, or technologies to improve visitor experiences and organizational performance. This includes innovations in exhibit design, service delivery, and engagement strategies. For example, incorporating AR and VR technologies allows visitors to experience historical events or artifacts in a dynamic and interactive way. Additionally, creative marketing campaigns and personalized visitor services are considered forms of innovation that enhance the overall museum experience.

Innovation is essential for museums to remain competitive in the cultural tourism industry. It enables institutions to attract new audiences, particularly younger generations who value digital interactivity and experiential learning. Innovations can also extend the museum's reach beyond its physical location through

virtual tours and online collections. Ultimately, innovation contributes to visitor satisfaction by creating unique and memorable experiences that differentiate the museum from other cultural attractions.

**4. Service Quality**

Service quality is a key determinant of customer satisfaction in the service industry, including museums. It encompasses various dimensions such as tangibility, reliability, responsiveness, assurance, and empathy. High service quality ensures that visitors have a positive experience from the moment they enter the museum until the end of their visit. This includes aspects such as the professionalism of staff, the availability of information, the cleanliness of facilities, and the efficiency of ticketing systems.

In this study, service quality is positioned as an intervening variable that mediates the relationship between digital transformation, education, innovation, and visitor satisfaction. Even if a museum implements advanced digital systems or innovative programs, the absence of high-quality service can undermine these efforts. Therefore, maintaining consistent service standards is critical for maximizing the benefits of digital and educational initiatives.

**5. Visitor Satisfaction**

Visitor satisfaction refers to the overall evaluation of a museum experience based on the extent to which the visitor's expectations are met or exceeded. It is a multidimensional concept influenced by factors such as exhibit quality, service delivery, educational value, and technological features. Satisfied visitors are more likely to return, recommend the museum to others, and engage in positive word-of-mouth promotion, which is essential for building the museum's reputation and sustainability.

Theories of customer satisfaction, such as the Expectation-Confirmation Theory, suggest that satisfaction arises when perceived performance meets or exceeds initial expectations. In the museum context, this means delivering experiences that are informative, engaging, and enjoyable. Digital transformation, educational programs, and innovative practices can significantly enhance these experiences, provided they are supported by high service quality.

**1. Hypotheses**

Based on the problem statement described above, the following hypothesis can be drawn:

H1 : Digital transformation positively influences visitor satisfaction.
H2 : Education positively influences visitor satisfaction.
H3 : Innovation positively influences visitor satisfaction.
H4 : Digital transformation positively influences service quality.
H5 : Education positively influences service quality.
H6 : Innovation positively influences service quality.
H7 : Service quality positively influences visitor satisfaction.
H8 : Service quality mediates the relationship between digital transformation and visitor satisfaction.
H9 : Service quality mediates the relationship between education and visitor satisfaction.
H10 : Service quality mediates the relationship between innovation and visitor satisfaction.

## METHOD

**1. Research Approach**

This study adopts a quantitative research approach with an explanatory design to analyze the influence of digital transformation, education, and innovation on visitor satisfaction, with service quality as an intervening variable. The research uses Structural Equation Modeling (SEM) with Partial Least Squares (PLS) to test the relationships among the variables. This approach is suitable because it allows for simultaneous analysis of multiple relationships and mediating effects.

**2. Population and Sample**

The population in this study consists of all visitors to the Sultan Sulaiman Badrul Alamsyah Museum in Tanjungpinang. Due to the large and unspecified number of visitors, the sampling technique applied is purposive sampling, which selects respondents based on specific criteria, namely individuals who have visited the museum and experienced its services, including digital features and educational programs. The sample size follows the SEM-PLS requirement, which recommends 5 to 10 times the number of indicators used in the research model. Based on this rule, the sample consists of 120 respondents.

### 3. Data Types and Sources

The data used in this research are quantitative primary data obtained directly from respondents through structured questionnaires. The questionnaire measures variables such as digital transformation, education, innovation, service quality, and visitor satisfaction using a Likert scale with five levels of agreement, ranging from "Strongly Disagree" to "Strongly Agree." In addition to primary data, secondary data are also collected from previous research, official museum reports, and literature relevant to digital transformation and service quality in museums.

### 4. Data Collection Techniques

The data collection technique employed in this research is the questionnaire survey method, which involves distributing structured questionnaires to museum visitors who meet the sampling criteria. The questionnaires are distributed both in paper-based form and through online platforms to ensure accessibility for respondents. Prior to full distribution, a pilot test is conducted to ensure the reliability and validity of the questionnaire items. Respondents are given clear instructions and assurances of confidentiality to ensure accurate and honest responses.

## RESULTS AND DISCUSSION

### Results

### 1. Descriptive Data Analysis

Based on the data, it shows that 79 respondents or 54.86% were female, while 65 respondents or 45.14% were male. Based on the table above, it can be concluded that the majority of respondents are female, with 79 respondents or 54.86%. This is because some jobs are more dominant and easier to do and understand for women.

Based on the respondents' data, it shows that 74 respondents or 51.39% are aged 21-30 years, 43 respondents or 29.86% are aged 31-40 years, 22 respondents or 15.28% are aged 41-50 years, and 5 respondents aged over 50 years old or 3.47%. This shows that the majority of employees at the Batam City Government Secretariat are of productive age. This age range indicates that employees are still competent and highly motivated to work, resulting in high productivity. It is hoped that younger employees can make a positive contribution to the company's progress.

Based on the data from the respondents, it shows that 19 respondents or 13.19% have a high school education, 18 respondents or 12.5% have a D3 education, 90 respondents or 62.5% have a bachelor's degree, and 17 respondents or 11.81% have a master's degree. It can be concluded that the majority of respondents have a bachelor's degree (S1), totaling 90 respondents or 62.5%. This is because education is the most important factor that employees must possess. A higher level of education enables employees to have better career prospects and work in a more organized manner. As a result, companies require employees with adequate education to support their career development and meet the company's objectives.

Based on the data, it is known that respondents who have worked for 1-5 years number 42 respondents or 29.17%, those who have worked for 6-10 years number 64 respondents or 44.44%, and those who have worked for more than 10 years number 38 respondents or 26.39%. This is because the length of time an employee has been working influences their work motivation and performance, enabling them to achieve results aligned with organizational goals and advance their careers.

### 2. Outer Model

**Table 1. Internal Consistency Analysis**

| | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average variance extracted (AVE) |
|---|---|---|---|---|
| Education | 0,970 | 0,973 | 0,973 | 0,737 |
| Satisfaction | 0,972 | 0,975 | 0,975 | 0,748 |
| Transformation | 0,978 | 0,981 | 0,980 | 0,792 |
| Quality | 0,984 | 0,986 | 0,986 | 0,854 |
| Innovation | 0,982 | 0,982 | 0,983 | 0,832 |

Source: Smart-PLS (2025)

Based on the internal consistency analysis data in the table above, The reliability and validity test results for the five constructs Education, Satisfaction, Transformation, Quality, and Innovation demonstrate excellent internal

consistency and convergent validity. Cronbach's Alpha values are very high for all constructs, with Education at 0.970, Satisfaction at 0.972, Transformation at 0.978, Quality at 0.984, and Innovation at 0.982, all of which exceed the minimum threshold of 0.70, indicating strong reliability. Composite reliability is equally strong, with rho_a and rho_c values consistently above 0.973 for all constructs, confirming the stability and accuracy of the measurement model. The Average Variance Extracted (AVE) values also meet the requirement of being greater than 0.50, showing good convergent validity: Education records 0.737, Satisfaction 0.748, Transformation 0.792, Quality 0.854, and Innovation 0.832. Among these, Quality has the highest AVE, reflecting the strongest indicator representation. These results confirm that the measurement model is robust and suitable for further structural analysis using SEM-PLS

**Table 2. External Load Value**

| | Education | Innovation | Satisfaction | Quality | Transformation |
|---|---|---|---|---|---|
| Education 1 | 0,844 | | | | |
| Education 10 | 0,753 | | | | |
| Education 11 | 0,888 | | | | |
| Education 12 | 0,914 | | | | |
| Education 13 | 0,866 | | | | |
| Education 2 | 0,855 | | | | |
| Education 3 | 0,868 | | | | |
| Education 4 | 0,855 | | | | |
| Education 5 | 0,796 | | | | |
| Education 6 | 0,817 | | | | |
| Education 7 | 0,897 | | | | |
| Education 8 | 0,902 | | | | |
| Education 9 | 0,889 | | | | |
| Satisfaction 1 | | 0,808 | | | |
| Satisfaction 10 | | 0,827 | | | |
| Satisfaction 11 | | 0,920 | | | |
| Satisfaction 12 | | 0,901 | | | |
| Satisfaction 13 | | 0,862 | | | |
| Satisfaction 2 | | 0,927 | | | |
| Satisfaction 3 | | 0,943 | | | |
| Satisfaction 4 | | 0,913 | | | |
| Satisfaction 5 | | 0,912 | | | |
| Satisfaction 6 | | 0,877 | | | |
| Satisfaction 7 | | 0,804 | | | |
| Satisfaction 8 | | 0,929 | | | |
| Satisfaction 9 | | 0,934 | | | |
| Innovation 1 | | | 0,825 | | |
| Innovation 10 | | | 0,918 | | |
| Innovation 11 | | | 0,763 | | |
| Innovation 12 | | | 0,615 | | |
| Innovation 13 | | | 0,887 | | |
| Innovation 2 | | | 0,833 | | |
| Innovation 3 | | | 0,814 | | |
| Innovation 4 | | | 0,823 | | |
| Innovation 5 | | | 0,880 | | |

Source: Smart-PLS (2025)

The Based on the table above, it can be seen that the outer loading values for variables X1, X2, X3, Y, and Z, where the values of all items in the 5 variables tested are greater than 0.7, all indicators in the 5 variables are declared valid.

**Table 3. Outer Loading Value for Stage 2 Testing**

| | Education | Innovation | Satisfaction | Quality | Transformation |
|---|---|---|---|---|---|
| Education1 | 0,844 | | | | |
| Education10 | 0,753 | | | | |
| Education11 | 0,888 | | | | |
| Education12 | 0,914 | | | | |
| Education13 | 0,866 | | | | |
| Education2 | 0,855 | | | | |
| Education3 | 0,867 | | | | |
| Education4 | 0,855 | | | | |
| Education5 | 0,796 | | | | |
| Education6 | 0,817 | | | | |
| Education7 | 0,897 | | | | |
| Education8 | 0,902 | | | | |
| Education9 | 0,889 | | | | |
| Innovation1 | | 0,825 | | | |
| Innovation10 | | 0,918 | | | |
| Innovation11 | | 0,763 | | | |
| Innovation12 | | 0,887 | | | |
| Innovation2 | | 0,833 | | | |
| Innovation3 | | 0,814 | | | |
| Innovation4 | | 0,823 | | | |
| Innovation5 | | 0,880 | | | |
| Innovation6 | | 0,885 | | | |
| Innovation7 | | 0,918 | | | |
| Innovation8 | | 0,914 | | | |
| Innovation9 | | 0,893 | | | |
| Satisfaction1 | | | 0,809 | | |
| Satisfaction10 | | | 0,823 | | |
| Satisfaction11 | | | 0,919 | | |
| Satisfaction12 | | | 0,898 | | |
| Satisfaction13 | | | 0,868 | | |
| Satisfaction2 | | | 0,926 | | |
| Satisfaction3 | | | 0,942 | | |
| Satisfaction4 | | | 0,911 | | |
| Satisfaction5 | | | 0,911 | | |
| Satisfaction6 | | | 0,883 | | |
| Satisfaction7 | | | 0,807 | | |
| Satisfaction8 | | | 0,927 | | |
| Satisfaction9 | | | 0,933 | | |
| Quality1 | | | | 0,934 | |
| Quality10 | | | | 0,940 | |
| Quality11 | | | | 0,940 | |

| | | | | | |
|---|---|---|---|---|---|
| Quality12 | | | | 0,938 | |
| Quality2 | | | | 0,919 | |
| Quality3 | | | | 0,913 | |
| Quality4 | | | | 0,912 | |
| Quality5 | | | | 0,918 | |
| Quality6 | | | | 0,899 | |
| Quality7 | | | | 0,905 | |
| Quality8 | | | | 0,929 | |
| Quality9 | | | | 0,942 | |
| Transformasi8 | | | | | 0,910 |
| Transformasi9 | | | | | 0,908 |
| Transformasi10 | | | | | 0,917 |
| Transformasi1 | | | | | 0,911 |
| Transformasi2 | | | | | 0,909 |
| Transformasi3 | | | | | 0,930 |
| Transformas4 | | | | | 0,917 |
| Transformasi5 | | | | | 0,881 |
| Transformasi6 | | | | | 0,918 |
| Transformasi7 | | | | | 0,927 |

**Table 3. Discriminant Validity**

| | Education | Innovation | Satisfaction | Quality | Transformation |
|---|---|---|---|---|---|
| Education | 0,858 | | | | |
| Satisfaction | 0,246 | 0,894 | | | |
| Transformation | 0,507 | 0,279 | 0,815 | | |
| Quality | 0,495 | 0,754 | 0,612 | | |
| Innovation | 0,093 | 0,464 | 0,124 | 0,824 | |

Source: Smart-PLS (2025)

The results of discriminant validity show that the discriminant validity value of each indicator item against its construct is higher than the discriminant validity value of the other indicators in the same construct. Thus, it can be concluded that all constructs or latent variables have discriminant validity that is better than the indicators in other blocks.

### 3. Inner Model

**Table 4. Colinearity Test Results**

| | Education | Innovation | Satisfaction | Quality | Transformation |
|---|---|---|---|---|---|
| Education | | 1,464 | | 1,347 | |
| Satisfaction | | | | | |
| Transformation | | 1,786 | | 1,356 | |
| Quality | | 2,107 | | | |
| Innovation | | 1,242 | | 1,017 | |

Source: Smart-PLS (2025)

All From the data above, the following can be described:

a. VIF for the correlation between X1 and Y is 1.708 < 5.00 (no collinearity problem).
b. The VIF for the correlation between X2 and Y is 3.547 < 5.00 (no collinearity issues).
c. The VIF for the correlation between X3 and Y is 2.960 < 5.00 (no collinearity issues).
d. VIF for the correlation between Z and Y is 1.556 < 5.00 (no multicollinearity issues).

Based on the above data, there are no multicollinearity issues in the correlations between X1 and Y, X2 and Y, and X3 and Y. However, there are no multicollinearity issues in the correlation between Z and Y.

## 4. Hypothesis Test Results

### Direct Effect Results

**Table 5. Direct Effect**

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | Tstatistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| Transformation -> Satisfaction | 0,440 | 0,454 | 0,079 | 5,602 | 0.000 |
| Education -> Satisfaction | 0,232 | 0,256 | 0,086 | 2,696 | 0.007 |
| Innovation -> Satisfaction | 0,267 | 0,272 | 0,082 | 3,263 | 0.001 |
| Transformation -> Quality | 0,514 | 0,512 | 0,082 | 6,235 | 0.000 |
| Education -> Quality | 0.370 | 0.367 | 0.080 | 4.649 | 0.000 |
| Innovation -> Quality | 0,115 | 0,113 | 0,111 | 1,029 | 0,304 |
| Quality -> Satisfaction | 0,816 | 0,823 | 0,096 | 8,534 | 0.000 |

Source: Smart-PLS (2025)

1. The direct effect of the Digital Transformation variable on the Visitor Satisfaction variable has a path coefficient value of 0.440 (positive), meaning that an increase in Digital Transformation will be followed by an increase in the Visitor Satisfaction variable. The effect of the Digital Transformation variable on Visitor Satisfaction has a P-Value of 0.000 < 0.05, indicating that there is a significant direct effect between Digital Transformation and Visitor Satisfaction.
2. The direct effect of the Education variable on the Visitor Satisfaction variable has a path coefficient of 0.232 (positive), meaning that an increase in the value of the Education variable will be followed by an increase in the Visitor Satisfaction variable. The effect of the Education variable on the Visitor Satisfaction variable has a P-value of 0.007 < 0.05, indicating that there is a significant direct effect between Education and Visitor Satisfaction.
3. The direct effect of the Education variable on the Visitor Satisfaction variable has a path coefficient of 0.232 (positive), meaning that an increase in the value of the Education variable will be followed by an increase in the Visitor Satisfaction variable. The effect of the Education variable on the Visitor Satisfaction variable has a P-value of 0.007 < 0.05, indicating that there is a significant direct effect between Education and Visitor Satisfaction.
4. The direct effect of the Digital Transformation variable on Service Quality has a path coefficient of 0.514 (positive), meaning that an increase in Digital Transformation will be followed by an increase in the value of the Service Quality variable. The effect of the Digital Transformation variable on Service Quality has a P-Value of 0.000 < 0.05, indicating that there is a significant direct effect between Digital Transformation and Service Quality.
5. The direct effect of the Education variable on Service Quality has a path coefficient of 0.370 (positive), which means that an increase in the value of the Education variable will be followed by an increase in the Service Quality variable. The effect of the Education variable on the Service Quality variable has a P-Value of 0.000 < 0.05, indicating a significant effect between the Education variable and the Service Quality variable.
6. The direct effect of the Innovation variable on Service Quality has a path coefficient of 0.115 (positive), meaning that an increase in the Innovation variable value will be followed by an increase in the Service Quality value. The effect of the Innovation variable on the Service Quality variable has a P-Value of 0.304 > 0.05, so it can be stated that the direct effect of Innovation on Service Quality is not significant.
7. The direct effect of the Service Quality variable on the Visitor Satisfaction variable has a path coefficient of 0.816 (positive), meaning that an increase in Service Quality will be followed by an increase in the

Visitor Satisfaction variable. The effect of the Service Quality variable on the Visitor Satisfaction variable has a P-Value of 0.000 < 0.05, indicating that there is a significant direct effect between Service Quality and Visitor Satisfaction

**Indirect Effect Results**

**Table 6. Indirect Effect Results**

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | Tstatistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| Transformation -> Quality -> Satisfaction | 0.359 | 0.374 | 0.080 | 4,467 | 0.000 |
| Education -> Quality -> Satisfaction | 0.218 | 0.226 | 0.079 | 4,607 | 0.000 |
| Innovation -> Quality -> Satisfaction | 0.302 | 0.300 | 0.065 | 2,276 | 0.006 |

Source: Smart-PLS (2025)

1. The indirect effect of Digital Transformation on Visitor Satisfaction, mediated by Service Quality, has a T-statistic value of 4.467 > 1.96 and a P-value of 0.00 < 0.05, meaning that the effect of Digital Transformation on Visitor Satisfaction through Service Quality is significant.
2. The indirect effect of education on visitor satisfaction, mediated by service quality, has a statistical T value of 4.607 > 1.96 and a P value of 0.000 < 0.05, meaning that the effect of education on visitor satisfaction through service quality is significant.
3. The indirect effect of innovation on visitor satisfaction, mediated by service quality, has a statistical T-value of 2.276 > 1.96 and a P-value of 0.008 < 0.05, meaning that the effect of innovation on visitor satisfaction through service quality is significant.
4.

**Coefficient Determination ($R^2$)**

The coefficient of determination (R Square) aims to evaluate the accuracy of a variable's prediction. In other words, it evaluates how the variation in the dependent variable is influenced by the variation in the independent variable in a path model.

**Table 7. Coefficient Determination Results**

| | R-square | Adjusted R-square |
|---|---|---|
| Satisfaction. | 0.889 | 0.872 |
| Quality. | 0.810 | 0.890 |

Source: Smart-PLS (2025)

The conclusion from testing the r-square value for Visitor Satisfaction is that the Adjusted R-Square for the path model using moderator variables is 0.872. This means that the ability of the variables Digital Transformation, Education, Innovation with Intervening Service Quality in explaining Visitor Satisfaction is 87.2%. Thus, the model is considered substantial.

**Discussion**

**1. Direct Effect of Digital Transformation on Museum Visitor Satisfaction**

The direct effect of the Digital Transformation variable on the Museum Visitor Satisfaction variable has a path coefficient value of 0.440 (positive), meaning that an increase in Digital Transformation will be followed by an increase in the value of the Visitor Satisfaction variable. The influence of the Digital Transformation variable on Visitor Satisfaction has a P-Value of 0.000 < 0.05, indicating that Digital Transformation has a significant effect on Museum Visitor Satisfaction. The research findings indicate that digital transformation has a significant influence on visitor satisfaction at the Sultan Sulaiman Badrul Alamsyah Museum. This finding indicates that the higher the application of digital transformation elements in museum services and information presentation, This aligns with customer satisfaction theory, which states that high-quality service, particularly innovative and adaptive to technological advancements, enhances user satisfaction (Kotler & Keller, 2016).

(2019:48) Digital transformation is a change in how tasks are handled using information technology to achieve efficiency and effectiveness in work. In other words, the digital transformation implemented by museum managers is already effective and efficient in facilitating visitors' experiences while inside the museum.

**2. Direct Effect of Education on Museum Visitor Satisfaction**

The direct effect of the Education variable on the Visitor Satisfaction variable has a path coefficient of 0.232 (positive), meaning that an increase in the value of the Education variable will be followed by an increase in the Visitor Satisfaction variable. The effect of the Education variable on the Visitor Satisfaction variable has a P-value of 0.007 < 0.05, indicating that there is a significant direct effect between Education and Visitor Satisfaction. This result shows that education has a significant effect on visitor satisfaction at the Sultan Sulaiman Badrul Alamsyah Museum. This indicates that the better the quality of the educational programs provided by the museum, the higher the level of satisfaction felt by visitors. Education in this context includes the dissemination of historical, cultural, and local values through engaging, easy-to-understand, and relevant media tailored to the needs and characteristics of visitors. According to Asniar et al. (2020:47), education is defined as activities that increase awareness in individuals, providing them with the knowledge they need to decide on the behavior or actions they will take.

**3. Direct Effect of Innovation on Museum Visitor Satisfaction**

The direct effect of the Innovation variable on the Museum Visitor Satisfaction variable has a path coefficient of 0.267 (positive), meaning that an increase in the Innovation variable will be followed by an increase in the Visitor Satisfaction variable. The influence of the Innovation variable on the Performance variable has a P-Value of 0.001 < 0.05, indicating that Innovation has a significant effect on Museum Visitor Satisfaction. Tjiptono (2017:24) defines customer satisfaction as “an emotional response to the evaluation of the consumption experience of a product or service.” As a response to the experience felt by customers after consuming a product or service. Meanwhile, according to Oslo (Zuhal, 2019:58), innovation has a very broad aspect because it can be in the form of goods or services, processes, marketing methods, or organizational methods that are new or have undergone renewal, which become solutions to problems previously faced by the organization. In this study, it was found that innovations implemented by museum management staff significantly influence visitor satisfaction. Some innovations carried out by museum management staff include organizing coloring competitions for kindergarten and elementary school children. Additionally, there is a Gurindam Dua Belas reading competition. Besides gaining knowledge and information about.

**4. Direct Effect of Digital Transformation on Service Quality**

The direct effect of the Digital Transformation variable on Service Quality has a path coefficient of 0.514 (positive), meaning that an increase in Digital Transformation will be followed by an increase in the value of the Service Quality variable. The influence of the Digital Transformation variable on Service Quality has a P-Value of 0.000 < 0.05, indicating that there is a significant direct influence of Digital Transformation on the Service Quality received by museum visitors. Service quality is the extent to which the reality of the service received by customers differs from their expectations (Lupiyoadi, 2018:216), while according to Hinings (2018:36) Digital transformation is the combined effect of several digital innovations produced by actors or stakeholders involved, structures, practices, values, and beliefs that change, threaten, replace, or complement existing rules within organizations, ecosystems, industries, or other fields. The relationship between these two variables is that with digital transformation, the service provided by museum management staff will also be more optimal because it facilitates the work being carried out.

**5. The Effect of Education on Service Quality**

The direct effect of the Education variable on Service Quality has a path coefficient of 0.370 (positive), which means that an increase in the value of the Education variable will be followed by an increase in the Service Quality variable. The influence of the Education variable on the Service Quality variable has a P-Value of 0.000 < 0.05, indicating that Education significantly influences the Service Quality provided by museum staff to museum visitors. Education is an activity that increases awareness in individuals, providing them with the knowledge they need to decide on their health behaviors or actions (Asniar, 2020:47). Meanwhile, Sualang (2020) defines service quality as a dynamic condition related to products, services, people, processes, and the environment, where quality is assessed at the time of public service delivery. Education is one of the most

effective ways to impart knowledge to someone. Good education enhances an individual's knowledge and skills. The education provided by museum staff to visitors is already good and aligns with existing standards. This is evident in visitors who come to the museum gaining additional knowledge and information about history and culture.

6. **The Effect of Innovation on Service Quality**
The direct effect of the Innovation variable on Service Quality has a path coefficient of 0.115 (positive), meaning that an increase in the value of the Innovation variable will be followed by an increase in the value of Service Quality. The influence of the Innovation variable on the Service Quality variable has a P-Value of 0.304 > 0.05, indicating that there is a direct but insignificant influence of the innovations implemented by museum managers on the quality of service provided. The research findings indicate that innovation does not have a significant impact on service quality at the Sultan Sulaiman Badrul Alamsyah Museum. This finding indicates that although the museum has made a number of innovative efforts in service and management, these innovations have not yet had a meaningful impact on improving the quality of service directly experienced by visitors. This is consistent with the theory proposed by Kotler and Keller (2016), which states that innovation will only have a significant impact if it is oriented toward the actual needs of consumers.

7. **The Effect of Service Quality on Museum Visitor Satisfaction**
The direct effect of the Service Quality variable on the Visitor Satisfaction variable has a path coefficient of 0.816 (positive), meaning that an increase in Service Quality will be followed by an increase in the Visitor Satisfaction variable. The influence of the Service Quality variable on the Visitor Satisfaction variable has a P-Value of 0.000 < 0.05, indicating that there is a significant direct influence between Service Quality and Visitor Satisfaction. According to Candra (2018:57), satisfaction can be interpreted as an effort to fulfill something or make something adequate. Public satisfaction can only be achieved by providing quality service. Service Quality is a dynamic condition related to products, services, people, processes, and the environment that meets or exceeds expectations, Siagian (2021:24).

8. **The Indirect Effect of Digital Transformation on Museum Visitor Satisfaction through Service Quality.**
The indirect effect of Digital Transformation on Visitor Satisfaction, mediated by Service Quality, has a T-statistic value of 4.467 > 1.96 and a P-value of 0.00 < 0.05, indicating that the effect of Digital Transformation on Visitor Satisfaction through Service Quality is statistically significant.This proves that the digital transformation developed by museum managers is effective because it can improve museum visitor satisfaction through the quality of service provided. Several factors contribute to this, including the digitalization or digital transformation already implemented by museum managers in certain areas of the museum, even though it is still in the trial phase, it has already improved the quality of service provided to visitors. This will also undoubtedly enhance the satisfaction of visitors coming to the museum. The results of this study support the findings of Aqil (2025), whose research showed that digital transformation has a significant impact on customer satisfaction

9. **The Indirect Effect of Education on Museum Visitor Satisfaction through Service Quality**
The indirect effect of education on museum visitor satisfaction, mediated by service quality, has a T-statistic value of 4.607 > 1.96 and a P-value of 0.000 < 0.05, indicating that the effect of education on visitor satisfaction through service quality is significant. Education is a form of educational service provided individually or in groups. Based on this, it can be concluded that the education provided by museum staff is the provision of experiences to museum visitors in the form of information about the museum's condition, history, and collections, which are necessary to enhance knowledge about the history and cultural wealth of the nation. As visitors gain more knowledge directly, they will feel a sense of satisfaction because their visit to the museum was not in vain. This study found that education significantly influences museum visitor satisfaction through the quality of service provided by museum managers. This demonstrates that education about cultural heritage artifacts and museum collections has the potential to improve service quality for museum visitors, thereby also enhancing their overall experience.

**10. The Indirect Effect of Innovation on Museum Visitor Satisfaction through Service Quality**

The indirect effect of innovation on museum visitor satisfaction, mediated by service quality, has a T-statistic value of 2.276 > 1.96 and a P-value of 0.008 < 0.05, indicating that the effect of innovation on visitor satisfaction through service quality is significant. The hypothesis testing in this study proves that innovation has a significant effect through service quality on museum visitor satisfaction. This means that the innovations implemented by museum managers have a significant impact on museum visitor satisfaction through service quality. This underscores the importance of creative and innovative innovations, as well as optimal service quality, as effective measures to enhance museum visitor satisfaction. This is because museum managers consistently implement updates and creative innovations to support the creation of quality service, thereby increasing visitor satisfaction. Innovations implemented by museum managers include organizing competitions on the museum grounds and providing special facilities for people with disabilities and breastfeeding mothers.

## CONCLUSION

Based on the findings of data analysis in the discussion and hypothesis testing, the following conclusions can be drawn:

1. Digital transformation has a significant direct effect on visitor satisfaction at the museum. This condition is influenced by several factors, including the implementation of digitalization by the management of Sultan Sulaiman Badrul Alamsyah Museum in several facilities, such as providing information through QR codes, digital signage, and the integration of social media and the official website for promotional purposes.
2. Education has a significant direct effect on visitor satisfaction at the museum. This is because the educational efforts provided by the museum management are considered good. Museum staff and tour guides are always ready to engage in direct discussions with visitors about the museum's exhibits. This interaction builds an emotional and intellectual connection with visitors.
3. Innovation has a significant direct effect on visitor satisfaction at the museum. This is due to several innovative programs implemented by the museum management, such as organizing coloring competitions for kindergarten and elementary school children, as well as a reading competition for Gurindam Dua Belas. These activities allow visitors to gain cultural knowledge and information while participating in interactive and engaging events.
4. Digital transformation has a significant effect on the service quality received by museum visitors. This is influenced by factors such as the implementation of digitalization in service areas, including the creation of digital content for artifacts and collections displayed in the museum.
5. Education has a significant effect on the service quality received by museum visitors. This is because the educational services provided by museum staff meet established standards. Visitors receive additional knowledge and information about the history and cultural heritage showcased in the museum, which enhances the overall service experience.
6. Innovation has an insignificant effect on the service quality received by museum visitors. This is due to limited service facilities, such as the absence of parking spaces and special toilets for visitors with disabilities. These shortcomings make it difficult for people with disabilities to enjoy a comfortable visit to the museum.
7. Service quality has a significant effect on visitor satisfaction at the museum. This is because the museum provides tour guides or educators to assist visitors during their visit. These guides offer detailed explanations about cultural heritage objects and museum collections, ensuring a high level of personalized service.
8. Digital transformation has a significant effect on visitor satisfaction through service quality. Although still in the trial stage, digitalization efforts by the museum, such as introducing digital features, have already contributed to improving service quality, which in turn enhances visitor satisfaction.
9. Education has a significant effect on visitor satisfaction through service quality. This demonstrates that providing educational information about cultural heritage objects and museum collections enhances service quality, which positively impacts overall visitor satisfaction.
10. Innovation has a significant effect on visitor satisfaction through service quality. This occurs because the museum management continuously introduces creative innovations to improve service quality, which ultimately leads to higher visitor satisfaction.

Based on the results of the discussion and conclusions above, the recommendations in this study are as follows:

1. Enhance Digital Transformation Efforts
   The museum should continue to strengthen its digital transformation initiatives by expanding the use of QR codes, improving digital signage, and integrating more interactive features such as virtual tours and mobile applications. This will not only enhance accessibility but also improve visitor engagement.
2. Improve Educational Programs
   The museum should develop more structured and innovative educational programs that appeal to different age groups, including school-based activities, thematic exhibitions, and online learning resources. Training for tour guides should also be prioritized to ensure consistent quality in educational delivery.
3. Increase Service Innovation
   While current innovations such as cultural competitions are beneficial, the museum should introduce more creative and technology-driven innovations, such as augmented reality experiences, gamification for young visitors, and interactive storytelling to make visits more engaging and memorable.
4. Upgrade Facilities to Support Service Quality
   To maximize the impact of innovation and education on service quality, the museum needs to improve its infrastructure. This includes providing adequate parking, accessible toilets for visitors with disabilities, and comfortable resting areas. These improvements will enhance overall service quality and visitor satisfaction.
5. Strengthen Staff Competence and Customer Service Skills
   Continuous training for museum staff is essential to improve their ability to deliver high-quality services, especially in digital and educational aspects. Emphasis should be placed on communication skills, hospitality, and adaptability to technological changes.
6. Promote Digital Marketing Strategies
   The museum should leverage social media platforms, official websites, and digital advertising to reach a broader audience and attract younger generations. Regular updates, engaging content, and interactive campaigns will increase the museum's visibility and visitor interest.
7. Monitor and Evaluate Service Quality Regularly
   The museum should establish a regular evaluation system to monitor visitor satisfaction and service quality. This can be achieved through feedback forms, online surveys, and data analytics to identify areas for improvement and implement necessary changes promptly.

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