Utilization of Artificial Intelligence for Customer Service: Phenomenological Study of Luwuk Startups

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A B S T R A C T

This study explores the utilization of Artificial Intelligence (AI) in enhancing customer service within digital startups, with a particular focus on DRIVE, a startup based in Luwuk, Indonesia. The rapid integration of AI technologies in business operations has reshaped the dynamics of customer interaction and satisfaction. However, there remains limited qualitative research that captures the lived experiences of customer service personnel in smaller startup environments. Using a qualitative phenomenological approach, data were collected through semi-structured interviews with key informants from DRIVE's customer service team. The participants were selected using purposive sampling to ensure relevant and rich insights. Data analysis was conducted through thematic analysis, allowing the emergence of key themes related to the implementation, challenges, and perceived benefits of AI in their customer engagement processes. The findings indicate that AI significantly improves response time, supports personalization of service, and reduces repetitive workloads. However, the study also uncovers critical concerns, including limited technical infrastructure, low digital literacy among some staff, and the need for continuous human oversight to maintain customer satisfaction. Participants emphasized that AI should act as a support tool rather than a full replacement for human interaction. This study contributes to the existing body of knowledge by providing an in depth understanding of how AI is operationalized in real startup settings, particularly in underrepresented regions such as Luwuk. The insights derived offer practical implications for startup managers, AI developers, and policymakers in designing more effective AI strategies tailored to local digital ecosystems. Future research could expand the scope to multiple startups and incorporate customer perspectives to enrich the analysis.

1. Introduction

1.1 Background

In the era of the Fourth Industrial Revolution, the development of digital technology has transformed various aspects of human life, including the business and service sectors. One of the most prominent innovations is the utilization of Artificial Intelligence (AI), which has revolutionized how companies interact with customers. AI enables service automation, customer data analysis, and the enhancement of service quality and efficiency in real time. This advancement is particularly relevant for digital startups, which often operate with limited resources but are expected to deliver fast and high-quality customer service.

In Indonesia, the digital startup ecosystem has shown continuous growth, including in regions outside the country's economic hubs, such as Luwuk, Central Sulawesi. One of the emerging local startups is DRIVE, a digital platform engaged in technology based services. However, the community of service users in Luwuk continues to face issues such as slow response times, ineffective communication, and inconsistent user experiences. These challenges indicate a gap between the potential of AI and its actual implementation in enhancing customer service within local startups.

Previous studies have highlighted several relevant issues concerning startups in Luwuk [1] examined the development of digital infrastructure in Luwuk and found that one of the major obstacles for local startups is the lack of advanced technology utilization such as AI. Similarly, [2] explored success factors for startups in underdeveloped regions, identifying technology adoption as a key determinant of business sustainability. These studies emphasize that although technological potential exists, the implementation of modern technologies especially in customer service remains limited.

This issue becomes more significant when viewed through the lens of customer service, a critical aspect for retaining clients and building user loyalty. [3] found that customer service quality significantly influences customer satisfaction in digital startups operating outside metropolitan areas. Meanwhile, [4] concluded that response speed and service personalization are the two main dimensions determining successful interactions between startups and users. These findings underscore the urgency of strengthening customer service, particularly in local contexts like Luwuk.

Furthermore, the relationship between customer service and the application of AI has been explored in several studies. [5] emphasized that integrating AI into customer service systems improves response time efficiency and the accuracy of information delivered to customers. In addition, [6] demonstrated that AI powered chatbots significantly enhance customer satisfaction when properly integrated into startup service systems. These studies show that AI not only improves operational efficiency but also enhances customer perceptions and experiences.

Two more studies specifically focused on AI utilization reinforce the argument for the importance of technological innovation in local contexts. [7] found that the success rate of AI integration in small and medium enterprises (SMEs) depends greatly on technological readiness and human resource capability. [8] concluded that understanding local customer needs is essential in designing effective and adaptive AI solutions.

Theoretically, this approach is supported by Technology Adoption Theory [9], which states that technology adoption is influenced by perceived usefulness, ease of use, and compatibility with the local context. In addition, the SERVQUAL model [10] outlines five key service quality dimensions tangibility, reliability, responsiveness, assurance, and empathy all of which can be enhanced through AI implementation.

1.2 Problem Statement

The community of digital service users in Luwuk particularly customers of local startups such as DRIVE faces challenges in obtaining customer service that is fast, responsive, and consistent. Despite the great potential of artificial intelligence technology, its utilization remains limited and has not been optimally integrated into the customer service systems of local startups. There is a clear gap between the potential of AI and its practical application in improving customer service quality in the Luwuk region.

1.3 Objectives and Scope

This study aims to explore how the utilization of artificial intelligence can enhance customer service in the local digital startup DRIVE, located in Luwuk. Employing a qualitative approach through phenomenological methods, this research investigates the lived experiences of startup practitioners and customers regarding AI implementation in a local context. The study is focused primarily on AI-supported customer service interactions within digital startup environments, and does not cover the technical development aspects of AI systems in detail.

2. Literature Review

2.1 Related Work

Artificial Intelligence (AI) has rapidly evolved into a transformative force within the customer service domain. AI based solutions such as chatbots, virtual assistants, and recommendation engines are revolutionizing how companies engage with customers by offering scalable, fast, and personalized services [11]. In particular, AI enables startups to streamline operational efficiency while maintaining high-quality interactions, even with limited human resources.

Research by [12] examined the role of AI chatbots in enhancing customer engagement in Southeast Asian startups. Their study found that AI significantly improved response time and customer satisfaction, especially in businesses with online-based services. However, they also highlighted challenges in adapting AI tools to the linguistic and cultural nuances of local users, which affected chatbot effectiveness.

Similarly, [13] explored the implementation of AI driven customer service in emerging economies and emphasized the importance of local context. Their findings revealed that while startups benefit from AI adoption, success is highly dependent on how well AI tools align with users' expectations and communication styles.

From a methodological perspective, [14] applied a qualitative phenomenological approach to investigate user experiences with AI services in the retail industry. Their study concluded that phenomenology provides deep insights into customer perceptions, especially in understanding emotional responses to automated service interactions an aspect often overlooked in quantitative evaluations.

In the Indonesian context, [15] investigated the use of AI chatbots in urban-based e commerce startups and discovered a clear relationship between AI integration and increased customer retention. Nevertheless, their study focused only on metropolitan areas, leaving a gap in understanding how AI works in rural or developing regions like Luwuk.

Furthermore, [16] explored the readiness of small startups in Eastern Indonesia to adopt AI based customer support systems. Their study highlighted that while startups showed high interest in digital transformation, many lacked strategic frameworks for sustainable AI implementation, particularly in personalized service management.

2.2 Research Gap

Although various studies have confirmed the value of AI in customer service, several critical gaps remain unaddressed. First, there is a lack of contextualized research focusing on how AI functions in non metropolitan startup environments, especially in Eastern Indonesian cities such

as Luwuk. Most existing literature emphasizes large or urban based startups, leaving smaller digital enterprises like DRIVE underexplored.

Second, there is limited understanding of the human experience and perception in AI-driven customer interactions within local cultures. While quantitative studies provide metrics on satisfaction or retention, few have adopted a phenomenological lens to uncover deeper user insights and emotional responses, which are crucial for improving AI integration.

Third, while several studies discuss technical or functional aspects of AI in service delivery, there is an insufficient linkage between service quality frameworks (e.g., SERVQUAL) and AI applications in rural startup contexts. This disconnect limits the practical application of AI technologies in achieving comprehensive, human centered customer service goals.

This study, therefore, addresses these gaps by exploring the lived experiences of both startup practitioners and customers of DRIVE, a digital startup in Luwuk, using a phenomenological method. The research contributes new insights on how AI is perceived, implemented, and experienced in customer service, specifically within the underrepresented geographical and organizational context of rural Indonesia.

3. Methodology

This study employs a qualitative phenomenological research design to explore and understand the lived experiences of stakeholders involved in the utilization of Artificial Intelligence (AI) for customer service within the digital startup "DRIVE" based in Luwuk. Phenomenology is chosen because it allows for an in-depth examination of how individuals perceive and interpret their interactions with AI technologies in real-world service contexts. This approach aligns well with the research objectives of capturing subjective experiences and meanings that quantitative methods might overlook.

The focus on phenomenology is particularly relevant given the novelty of AI applications in startups operating in less urbanized settings like Luwuk, where cultural and contextual factors may influence technology adoption and service delivery.

3.1 Data Collection

Data were collected from multiple sources to achieve data triangulation and deepen the understanding of AI utilization in customer service at DRIVE. Primary data were gathered through semi structured, in depth interviews with key informants, including:

- Startup management and AI system developers responsible for implementing AI tools.
- Customer service representatives who interact with AI systems.
- Customers who have experienced AI based service interactions.

Participants were selected using purposive sampling, targeting individuals with direct involvement or experience in AI enabled customer service. This method ensures the relevance and richness of the data collected. The interviews were conducted face to face and online, recorded with consent, and transcribed verbatim for detailed analysis.

In addition to interviews, participant observation was conducted to capture non-verbal cues and contextual interactions during customer service processes. Relevant documents such as service logs, AI chatbot scripts, and company reports were also reviewed to complement and validate interview data.

3.2 Analysis Techniques

Data analysis followed the phenomenological data analysis framework, primarily based on the steps of:

1. Data Familiarization: Immersing in the interview transcripts and observational notes to gain a comprehensive understanding.
2. Identification of Meaning Units: Highlighting significant statements related to AI use in customer service.
3. Formulation of Themes: Clustering meaning units into thematic categories that represent the essence of participants' experiences.
4. Textural and Structural Description: Developing detailed descriptions of what participants experienced (textural) and how they experienced it (structural).
5. Synthesis: Integrating these descriptions to produce a comprehensive understanding of AI utilization in the startup context.

The coding process was performed manually and supported by qualitative data analysis software to organize data efficiently. The thematic approach allows uncovering patterns, perceptions, and challenges related to AI application in customer interactions.

3.3 Validation

To ensure the credibility and trustworthiness of the findings, several validation strategies were implemented:

- Triangulation: Using multiple data sources (interviews, observations, documents) to cross-verify information and reduce bias.
- Member Checking: Sharing preliminary findings with selected participants to confirm the accuracy of interpretations and clarify any misunderstandings.
- Peer Debriefing: Consulting with academic peers to review the analysis process and findings, providing critical feedback to enhance rigor.
- Thick Description: Providing detailed contextual information to enable transferability of findings to similar settings.
- Audit Trail: Keeping systematic records of data collection and analysis procedures to support transparency and reproducibility.

These methods collectively strengthen the reliability and validity of the study, ensuring that the insights generated genuinely reflect the experiences of those involved in AI enabled customer service at DRIVE.

4. Results and Discussion

4.1 Key Findings

Based on phenomenological data analysis from interviews, observations, and documents, several main themes emerged regarding the utilization of Artificial Intelligence (AI) for customer service at the digital startup DRIVE, as follows:

No	Theme	Description	Frequency
1	Improved Response Efficiency	AI chatbots significantly reduced customer wait times and sped up response times.	15
2	Personalized Customer Interaction	AI systems enabled personalized recommendations based on customer data and behavior.	12

No	Theme	Description	Frequency
3	User Acceptance Challenges	Some customers showed discomfort or reluctance to interact with AI-based services.	8
4	Operational Cost Reduction	AI reduced the need for a large customer service staff, lowering operational costs.	10
5	Technical Integration Issues	Technical difficulties in integrating AI with existing systems were reported.	6

Frequency refers to the number of informants mentioning each theme.

The table 1 summarizes five main themes that emerged from interviews and observations. The first theme highlights how AI, especially chatbots, accelerated customer response times, which had been a major issue in DRIVE's customer service. This was confirmed by the majority of service staff and interviewed customers (15 respondents).

The second theme shows that AI also enables more personalized interactions by analyzing customer data, helping provide relevant product recommendations or solutions, thereby improving customer satisfaction (12 respondents).

However, not all responses were positive; the third theme revealed challenges in user acceptance, especially from customers less familiar or uncomfortable with automated services, which requires attention in startup communication strategies.

The fourth theme highlights positive impacts on operational cost efficiency, with reduced human labor needs in customer service, allowing the startup to allocate resources more optimally.
Finally, the fifth theme concerns technical challenges, particularly integrating AI with existing systems, which presents temporary obstacles requiring further technical solutions for optimal AI implementation.

No	Customer Feedback on AI Features	Positive (%)	Neutral (%)	Negative (%)
1	Service response speed	80	15	5
2	Accuracy of provided information	70	20	10
3	Ease of use of AI interface	65	25	10
4	Satisfaction with personalized offers	75	15	10

Table 2 shows the survey results of customer feedback on AI features in DRIVE's services. Most customers responded positively to service speed (80%) and accuracy of information provided (70%), indicating AI effectively meets customer expectations.
Ease of use of the AI interface also received positive responses, although some customers were neutral or negative, indicating a need for further training or education.
Personalized offers tailored to customer preferences were also significantly appreciated, reinforcing the personalization theme found in the qualitative analysis.

4.2 Interpretation of Results

The findings confirm that the utilization of AI in customer service at the DRIVE startup in Luwuk brings significant benefits, especially in improving service efficiency and personalization. The use of AI chatbots can speed up response times and reduce staff workload, which is crucial for startups with limited resources.

However, challenges were also found in the form of user resistance to automated interactions and technical integration issues, indicating the need for a more human centered approach and ongoing technical development.

The combination of quantitative and qualitative findings supports the conclusion that although AI can substantially improve customer service quality, the success of its implementation heavily depends on user acceptance and technological infrastructure readiness.

Overall, this study provides valuable insights for similar startups seeking to adopt AI technology in customer service, particularly in small cities with unique characteristics and challenges like Luwuk.

The utilization of AI in DRIVE's customer service shows significant improvements in efficiency and personalization but is accompanied by challenges related to customer acceptance and technical issues that must be addressed for sustainable optimization.

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5. Discussion

5.1 Comparison with Prior Research

The findings of this study demonstrate that the utilization of Artificial Intelligence (AI) significantly enhances customer service efficiency and personalization at the DRIVE startup in Luwuk. This aligns with recent research by [17], who reported that AI enabled chatbots effectively reduce response times and improve customer satisfaction in digital services. Similarly, [18] found that AI personalization positively influences customer loyalty, supporting the present study's theme of tailored customer interaction.

Furthermore, the challenge of user acceptance identified here is consistent with findings by [19], who noted that user resistance to AI technologies remains a barrier in customer facing applications. Technical integration difficulties observed echo the conclusions of [20], who emphasize that seamless system interoperability is crucial for successful AI deployment.

Other recent studies by [21] and [22] corroborate the cost efficiency benefits of AI in startups, highlighting operational cost reductions as a key advantage. The present research complements the work of [23] and [24], who emphasize the necessity of continuous user education to overcome discomfort with AI services.

Moreover, this study contributes uniquely to the existing literature by focusing on a small city context (Luwuk), as most prior research centers on metropolitan startups [25] [26]. This regional focus provides insights into challenges and opportunities specific to emerging digital ecosystems.

In summary, the results are consistent with the broader academic consensus on AI's benefits in customer service while highlighting persistent challenges, particularly in smaller urban settings. This affirms the relevance and timeliness of the current investigation.

5.2 Limitations

Despite its contributions, this study has certain limitations. The phenomenological approach relies heavily on participant perceptions, which may introduce subjective bias. The sample size, while adequate for qualitative depth, limits the generalizability of findings beyond the DRIVE startup and the Luwuk context. Additionally, the technical scope was limited to AI integration challenges without exploring detailed technological solutions or alternative AI models.

Furthermore, external factors such as varying internet infrastructure and digital literacy in Luwuk were not deeply analyzed, which could affect the broader applicability of results. Future quantitative studies could complement these findings by statistically validating the observed trends.

5.3 Future Research

Building on these findings, future research should explore scalable AI implementation frameworks tailored for startups in similar regional contexts. Investigating customer acceptance through longitudinal studies can deepen understanding of adaptation over time. Additionally, comparative studies involving multiple startups across different Indonesian cities could enhance the generalizability of insights.

Research into advanced AI models, such as natural language processing improvements and emotion recognition, may also address user acceptance challenges. Finally, integrating technical evaluations of AI platforms and infrastructure readiness would provide a comprehensive view beneficial for practitioners and policymakers.

This study highlights the transformative potential of AI in enhancing customer service quality and operational efficiency for digital startups like DRIVE in smaller cities. Practically, startups should invest in user education programs to mitigate resistance and allocate resources to address technical integration issues proactively. Policymakers may consider supporting infrastructure development to facilitate smoother AI adoption in regional areas.

In conclusion, while AI offers promising advantages, success depends on a holistic approach encompassing technology, human factors, and regional considerations. The present research contributes valuable empirical evidence and guidance for advancing AI enabled customer service in emerging digital markets.

6. Conclusion

This study investigates the utilization of Artificial Intelligence (AI) in enhancing customer service at the digital startup DRIVE in Luwuk through a phenomenological approach. The research addresses the challenges and opportunities faced by startups in adopting AI to improve customer interactions and operational efficiency.

Using qualitative data collected from key stakeholders and customers of DRIVE, the study provides deep insights into how AI technologies influence service quality, customer satisfaction, and business performance. Key findings reveal that AI contributes significantly to faster response times, personalized customer engagement, and cost efficiency. However, challenges such as user acceptance, technical integration, and infrastructural limitations persist and require ongoing attention.

This research contributes to the academic field by extending AI utilization studies into the context of emerging startups in smaller urban areas, which have been underrepresented in previous literature focused mainly on metropolitan regions. It also highlights practical implications for startup managers and policymakers in developing tailored strategies to overcome adoption barriers.

In summary, the study confirms that AI plays a pivotal role in transforming customer service within digital startups like DRIVE, with benefits and challenges that warrant continuous research and adaptive management. Future work should focus on scalable AI frameworks, customer adaptation processes, and technological advancements to further optimize AI's role in customer service.

7. Recommendation

This study addresses the critical issue of integrating Artificial Intelligence (AI) in customer service within digital startups, specifically focusing on DRIVE in Luwuk. Employing a phenomenological qualitative approach, the research explores stakeholders' and customers' lived experiences with AI implementation.

The findings highlight that AI significantly enhances service responsiveness, personalization, and operational efficiency, while also revealing challenges such as user acceptance and technical

integration barriers. These insights contribute valuable knowledge to the relatively underexplored context of AI adoption in startups operating in smaller urban settings.

Based on these outcomes, it is recommended that startup managers prioritize continuous user education and support to improve AI acceptance. Furthermore, investing in robust technical infrastructure and integration capabilities is essential to maximize AI benefits. Policymakers should also consider facilitating digital infrastructure development and providing targeted assistance to startups in emerging regions.

This study enriches the academic discourse by expanding AI utilization research beyond metropolitan areas, offering practical guidance for startups and stakeholders. Future research should focus on longitudinal studies assessing AI adoption over time and explore advanced AI models tailored to customer service needs in diverse regional contexts.

Appendix

This appendix contains supplementary materials supporting the main body of the research, including detailed interview guides and coding framework used in the phenomenological study of AI utilization in customer service at DRIVE startup in Luwuk.

A. Interview Guide

No	Question	Purpose
1	Can you describe your experience using AI-based customer service tools at DRIVE?	To explore user interaction with AI tools
2	What benefits have you observed from AI in enhancing customer service?	To identify perceived advantages
3	Have you encountered any challenges or limitations with AI implementation?	To understand obstacles faced
4	How do you think AI affects customer satisfaction and loyalty?	To assess impact on customer relationship
5	What suggestions do you have to improve AI utilization in customer service at DRIVE?	To gather improvement recommendations

B. Data Coding Framework

Code	Description	Example Quote
AI_BEN	AI Benefits	“Response times have decreased significantly.”
AI_CHL	AI Challenges	“Sometimes the system fails to understand my requests.”
CS_QLT	Customer Service Quality	“AI helps personalize my experience effectively.”
USER_ACC	User Acceptance	“Initially, I was hesitant but now I find it useful.”
TECH_INT	Technical Integration Issues	“Integration with our existing systems is still tricky.”

C. Supplementary Data Table: AI Features Usage Frequency

AI Feature	Frequency of Use (times/week)	Percentage of Users (%)
Automated Chatbots	45	90

AI Feature	Frequency of Use (times/week)	Percentage of Users (%)
Voice Recognition	30	60
Predictive Analytics	25	50
Personalized Recommendations	40	80

This appendix supports the transparency and reproducibility of this study by providing detailed methodological tools and data illustrations that complement the main findings in the article.

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