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Digital-Based Customer Service Development Strategy in the Business Development Division of Merchant Marine in Indonesia

Suhartini Suhartini[1], Larsen Barasa[2], Aliya Izet Begovic Yahya
[1]Sekolah Tinggi Ilmu Pelayaran Jakarta, Jakarta, Indonesia, ghina.adityas@gmail.com
[2]Sekolah Tinggi Ilmu Pelayaran Jakarta, Jakarta, Indonesia, larsenbarasa@gmail.com
[3]Sekolah Tinggi Ilmu Pelayaran Jakarta, Jakarta, Indonesia, kenaripermai375@gmail.com

Corresponding Author: larsenbarasa@gmail.com[2]

Abstract: Digital transformation in customer service is reshaping how educational institutions manage stakeholder engagement, yet systematic evidence from Indonesian maritime vocational institutions remains scarce. This study examines the digital-based customer service development strategies implemented by the Business Development Division of Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta, analyzing how five integrated digital tools web-based service platforms, AI-powered chatbots, WhatsApp customer service, Zoom consultations, and Google Forms satisfaction surveys collectively affect communication efficiency, responsiveness, and service quality. A qualitative case study design was employed, drawing on semi-structured interviews with 8 key informants from the Business Development Division, direct observation of digital tool deployment, and analysis of CRM logs and satisfaction survey data across one academic year. Data were analyzed through a systematic six-phase thematic analysis with intercoder verification (Cohen's Kappa $\kappa = 0.82$). The study's key findings reveal three interdependent success factors: technological infrastructure quality, staff digital literacy and training, and data-driven iteration and identify digital literacy constraints among customers as the most significant remaining implementation barrier. The principal theoretical contribution is a contextually grounded integration of SERVQUAL service quality dimensions (Parasuraman et al., 1988) with digital transformation theory within an Indonesian maritime higher education context the first such integration for this institutional type demonstrating that reliability and responsiveness dimensions of service quality are most substantially improved by AI chatbot and WhatsApp integration, while assurance and empathy dimensions are most effectively addressed through Zoom consultation. The findings provide maritime educational institutions with an evidence-based digital service integration model transferable across analogous vocational higher education contexts.

Keyword: Digital Customer Service, Business Development, AI Chatbot, Customer Satisfaction, Maritime Education, Digital Transformation.

INTRODUCTION

The competitive landscape of Indonesian higher education has intensified the imperative for institutions to reorient toward customer-centric service delivery. For maritime polytechnics like STIP Jakarta, whose stakeholder base comprises prospective cadets, enrolled students, alumni, and industry partners simultaneously, service quality is not merely a satisfaction metric but a determinant of institutional reputation, enrollment sustainability, and industry partnership viability (Wulandari & Cahyadi, 2025; Wahyudi et al., 2025). As digital transformation reshapes customer expectations across all service sectors, educational institutions face pressure to match the responsiveness, accessibility, and personalization that private sector digital service benchmarks have established. Customers who interact daily with e-commerce platforms, mobile banking, and instant messaging services bring equivalent responsiveness expectations to their interactions with institutional service systems expectations that conventional administrative channels cannot meet (Kumar et al., 2023; Bong & Suh, 2024).

The Business Development Division of STIP Jakarta occupies a position at the intersection of academic administration, industry partnership management, and customer engagement. This division is responsible for managing service interactions with a diverse stakeholder population while simultaneously pursuing institutional growth objectives a dual mandate that creates specific service quality demands combining speed of response, accuracy of information, personalization of engagement, and sustainability of relationships. The deployment of digital tools to address these demands represents an institutional digital transformation initiative whose effectiveness and implementation conditions have not been systematically documented.

Despite extensive scholarly attention to digital transformation in service industries generally (Bong & Suh, 2024; Taylor & James, 2022) and to educational quality management specifically (Sutono et al., 2025; Othman et al., 2025), the intersection of these two domains within Indonesian maritime vocational education has not been systematically examined. Existing studies address either digital tools in commercial service contexts or quality management in educational institutions but not the specific conditions under which digital tool integration improves customer service quality within the institutional constraints of a government maritime polytechnic. The digital literacy gradient among STIP Jakarta's stakeholder base where industry professionals possess high technological fluency while cadets from rural Indonesian regions may have limited digital experience creates an implementation challenge not addressed in the general digital transformation literature. This study fills this gap by providing systematic qualitative evidence of what digital strategies work, how they are implemented in practice, and under what institutional conditions they succeed or fail within an Indonesian maritime education context.

Three research questions structure the investigation: **(**RQ1) What digital-based customer service strategies have the Business Development Division of STIP Jakarta implemented to improve service quality? (RQ2) How are these strategies operationalized in practice, and what implementation conditions enable or constrain their effectiveness? (RQ3) What factors determine the success or failure of digital customer service transformation in this institutional context?

The study pursues three corresponding objectives: to document and analyze the digital tools deployed by the Business Development Division; to examine the implementation processes and operational conditions of each tool; and to identify the institutional, human, and technological factors that mediate digital service transformation outcomes. The findings are intended to provide an evidence-based implementation model for analogous maritime and vocational higher education institutions pursuing digital customer service transformation.

METHOD

Research Design

This study employed a qualitative case study design (Creswell & Poth, 2018; Merriam & Tisdell, 2016) examining the Business Development Division of STIP Jakarta as a bounded institutional case. The case study design was appropriate for investigating how, why, and under what conditions a specific set of digital tools improves customer service quality — questions requiring contextual depth and process understanding that quantitative designs cannot provide. The design follows an interpretivist epistemological orientation, treating institutional practices as contextually meaningful rather than context-free phenomena.

Participants and Data Sources

Key Informants (n=8): Semi-structured interviews were conducted with eight members of the Business Development Division representing all functional roles involved in digital service delivery: the Division Head, the Digital Services Coordinator, two Customer Service Officers, the IT Support Officer, the Marketing and Partnership Officer, the Training and Development Officer, and the Alumni Relations Officer. This purposive selection ensured that all aspects of digital tool deployment strategic decision-making, operational implementation, technical maintenance, and customer-facing delivery were represented in the informant sample.

Document Analysis: CRM interaction logs, customer satisfaction survey results (Google Forms), digital communication records (WhatsApp response time logs), and Zoom meeting attendance records from the 2024 academic year were analyzed as secondary data sources providing quantifiable indicators of service performance.

Direct Observation: Three months of direct observation of the Division's daily digital service operations were conducted, including observation of chatbot interactions, WhatsApp customer service sessions, and Zoom consultation procedures.

Table 1. Key Informant Characteristics

Role	Experience (years)	Primary Digital Tool Responsibility
Division Head	14	Strategic oversight, all tools
Digital Services Coordinator	8	Chatbot, web platform
Customer Service Officer (1)	5	WhatsApp, Google Forms
Customer Service Officer (2)	3	WhatsApp, queue management
IT Support Officer	7	Web platform, chatbot maintenance
Marketing and Partnership Officer	6	Zoom meetings, CRM
Training and Development Officer	9	Staff training, Zoom
Alumni Relations Officer	4	WhatsApp, Google Forms

Data Collection Procedure

Semi-structured interviews were conducted face-to-face at STIP Jakarta's Business Development Division office between October and December 2024. Each interview lasted 60 to 90 minutes, was audio-recorded with informed consent, and was transcribed verbatim within one week. An interview protocol organized around the three research questions guided each session while allowing conversational elaboration. The protocol addressed: the digital tools currently deployed and their service quality objectives; the implementation process and practical operational conditions; and the factors enabling and constraining that influence each tool's effectiveness.

Document analysis followed Miles and Huberman's (1994) content analysis framework, examining CRM and interaction records for patterns in response times, resolution rates, and satisfaction scores across digital channels. Observation field notes were recorded daily using

structured observation templates capturing digital interaction volumes, staff response procedures, and customer-facing tool usage patterns.

Thematic Analysis: Six-Phase Procedure

Interview data underwent thematic analysis following Braun and Clarke's (2006) six-phase procedure. Phase 1 (Familiarization): All eight transcripts were read twice with initial researcher memos on patterns. Phase 2 (Open Coding): Line-by-line coding in NVivo 14 generated 127 initial codes. Phase 3 (Focused Coding): Initial codes were grouped into 14 sub-categories, consolidated into three overarching themes: digital tool integration and SERVQUAL dimension mapping; implementation enablers and constraints; and digital literacy as a mediating factor. Phase 4 (Theme Review): Themes were validated against the full dataset; one sub-category was merged with another. Phase 5 (Theme Definition): Each theme was assigned a precise analytical definition. Phase 6 (Triangulation): Interview themes were cross-referenced with document data and observation field notes. A second independent coder coded 25 percent of the transcript corpus; Cohen's Kappa was calculated at $\kappa = 0.82$, indicating strong intercoder agreement (Landis & Koch, 1977). Member checking was conducted with the Division Head and Digital Services Coordinator, who reviewed and confirmed preliminary theme summaries.

RESULT AND DISCUSSION

Results

The analysis generated three overarching themes: (1) digital tool integration and service quality dimension mapping, (2) implementation enablers and constraints, and (3) digital literacy as a mediating factor. The themes emerged through the six-phase coding process and were verified through document triangulation and member checking.

1. Digital Tool Integration and SERVQUAL Dimension Mapping

The Business Development Division has deployed five integrated digital tools, each addressing specific SERVQUAL service quality dimensions.

Table 2. Digital Tool Integration and SERVQUAL Dimension Mapping

Digital Tool	Primary SERVQUAL Dimension	Implementation Status	Key Outcome
Web-based service platform	Tangibles, Reliability	Fully operational	Centralized 24/7 information access
AI-powered chatbot	Responsiveness, Reliability	Operational (limited scope)	Instant response to standard queries
WhatsApp customer service	Responsiveness, Assurance	Fully operational	Sub-1-hour response time standard
Zoom consultations	Empathy, Assurance	Operational	Personalized real-time consultation
Google Forms satisfaction surveys	Reliability (feedback loop)	Fully operational	Monthly service quality data

The web-based platform functions as the foundational information architecture, providing the stable, always-available reference environment within which other tools operate. The Digital Services Coordinator described its role:

"The website is the foundation. Everything else the chatbot, WhatsApp, the survey forms link back to the website. Before we had it, every inquiry had to come through the office directly. Now the platform handles maybe sixty percent of information requests automatically, because the answers are already there."

The AI-powered chatbot, integrated within the web platform, addresses the reliability and responsiveness dimensions by providing immediate, consistent responses to standard

inquiries course registration, tuition schedules, document requirements without waiting for human agent availability. One Customer Service Officer noted both its effectiveness and its current scope limitation:

"The chatbot handles the questions that come in most often, and it handles them correctly every time. But it cannot handle complex questions or anything that requires understanding the student's specific situation. For those, it routes to us on WhatsApp. The system works when the question fits the script. When it doesn't, the handover to a human need to be fast."

The WhatsApp customer service channel has become the Division's highest-volume engagement platform. CRM records show that WhatsApp accounts for 67 percent of all customer service interactions, with an average response time of 38 minutes during business hours well within the Division's 60-minute response commitment. The Division Head attributed this channel's success to its alignment with existing customer behavior:

"Everyone in Indonesia uses WhatsApp. We are not asking customers to learn a new system we are going to where they already are. That is the reason the adoption has been almost universal. The only customers not using it are those with very limited connectivity, usually from remote areas."

Zoom meetings address the empathy and assurance dimensions by enabling real-time, face-to-face consultation that WhatsApp cannot provide for complex or sensitive service interactions. The Training and Development Officer described its particular value for customers with limited digital confidence:

"When a student's parent contacts us about a problem a financial issue, a welfare concern WhatsApp is not enough. They need to feel heard, to see a face, to have a conversation. Zoom gives us that, even remotely. It has been especially important for parents who are not comfortable with technology, because a Zoom meeting is still a conversation. They can manage that."

2. Implementation Enablers and Constraints

Three factors emerged as the primary determinants of digital service implementation effectiveness: technological infrastructure quality, staff digital competency, and data-driven iteration.

Technological Infrastructure: The IT Support Officer described the infrastructure conditions as generally adequate but with identified vulnerabilities:

"The platform and the chatbot run on reliable servers. We have not had major downtime in the past eighteen months. But the WhatsApp integration is dependent on staff having charged devices and reliable internet when there are connectivity problems in the building, our response times go up. We are still dependent on human infrastructure for what should be a digital system."

Staff Digital Competency and Training: The Training and Development Officer confirmed that staff digital competency development preceded tool deployment rather than following it a sequencing decision that distinguished STIP Jakarta's implementation from less successful institutional digital transformation initiatives:

"Before we deployed any tool, we trained the staff to use it. Not just technically we trained them on how to use it to serve customers better. The chatbot rollout took three months of preparation before any customer saw it. If you deploy technology before your people are ready, customers experience the staff's uncertainty, not the technology's capability."

Data-Driven Iteration: Google Forms satisfaction surveys, analyzed monthly, provided the feedback mechanism for ongoing service adjustment. The Marketing and Partnership Officer described how survey data had directly shaped tool modifications:

"The survey data told us that customers wanted faster escalation from the chatbot to human service when the chatbot could not answer their question. We reduced the escalation

threshold from five failed responses to two. Response satisfaction scores for chatbot interactions went up fourteen points in the following month. Without the survey data, we would not have known what to fix."

3. Digital Literacy as Mediating Factor

The most significant remaining implementation constraint identified across all informants was the digital literacy gradient within STIP Jakarta's customer base. The Marketing and Partnership Officer described its specific manifestation:

"Our industry partners, port companies, shipping lines are comfortable with everything we have deployed. For enrolled students at STIP, WhatsApp and the web platform work well because they use these tools every day in their personal lives. The challenge is prospective students from rural areas and their parents. They have phones but sometimes limited data connectivity and limited familiarity with anything beyond basic calling and SMS. For them, Zoom is actually easier than the chatbot or even the website, because it is face-to-face conversation."

Discussion

1. Mapping Findings to Research Questions

The three empirical themes address all three research questions. RQ1 (digital strategies implemented) is answered by Table 1 and Theme 1: the five-tool ecosystem maps coherently onto SERVQUAL dimensions, with each tool addressing specific service quality deficits rather than representing technology adoption for its own sake. RQ2 (how strategies are operationalized) is addressed by Theme 2: implementation sequencing training preceding deployment, infrastructure verification preceding customer-facing rollout is the critical operationalization variable differentiating STIP Jakarta's approach from less successful institutional digital transformation cases. RQ3 (factors determining success or failure) is answered by Themes 2 and 3: the three enabling factors (infrastructure, staff competency, data-driven iteration) and the one mediating constraint (customer digital literacy) constitute the factor model explaining implementation variance.

2. Theoretical Interpretation: SERVQUAL Dimension Coverage and Digital Tool Complementarity

The five-tool ecosystem demonstrates a coherent SERVQUAL coverage strategy that prior research has not explicitly theorized for educational institutional contexts. The chatbot and WhatsApp address reliability and responsiveness the dimensions Rosen and Thompson (2023) identify as most consequential for educational customer satisfaction with the chatbot providing reliability through consistent, accurate automated responses and WhatsApp providing responsiveness through rapid human engagement. Zoom addresses empathy and assurance dimensions that Taylor and James (2022) established require human-mediated interaction for adequate expression in service contexts while the web platform and satisfaction surveys provide the tangibles and reliability feedback loop infrastructure supporting the entire ecosystem.

This complementary architecture extends Bong and Suh's (2024) finding that digital transformation in service management is most effective when driven by service quality objectives: the finding here is more specific each tool must be matched to the SERVQUAL dimensions it is best positioned to address, rather than deployed uniformly across all service interactions. The Division's routing architecture chatbot handling standard queries, WhatsApp escalating complex ones, Zoom resolving sensitive or personalized matters operationalizes this tool-to-dimension matching principle in a replicable institutional design.

3. Implementation Sequencing as Theoretical Contribution

The finding that staff training preceded tool deployment in STIP Jakarta's implementation and that this sequencing is attributed by informants as a critical success

factor extends Nidhom et al.'s (2025) systematic review finding that staff competency is a necessary antecedent of successful digital service quality improvement. The Training and Development Officer's account of three months of pre-deployment staff preparation for the chatbot rollout represents an operationalization of this principle that provides a practical institutional model. This contrasts with the pattern Othman et al. (2025) documented in their TVET digitalisation review, where technology investment precedes capacity investment generating staff uncertainty that customers perceive as service quality degradation rather than improvement.

Sutono et al.'s (2025) finding that institutional commitment and leadership drive are primary enabling conditions for digital service quality improvement is confirmed by the Division Head's account of strategic oversight spanning all five tools establishing that the coherence of STIP Jakarta's digital service ecosystem reflects intentional architectural design rather than incremental tool accumulation.

4. Digital Literacy as a Service Equity Issue

The digital literacy gradient identified in Theme 3 represents more than an implementation challenge it constitutes a service equity concern that the SERVQUAL framework does not explicitly address. If the empathy and responsiveness dimensions of service quality are differentially accessible based on customers' digital literacy levels, then digital service transformation may improve average service quality while simultaneously widening the service quality gap between digitally fluent and digitally limited customers. The Division's identification of Zoom as the most accessible tool for customers with limited digital experience because it is a face-to-face conversation rather than a text-based or navigational interface provides an evidence-based design principle: digital service transformation must ensure that at least one tool in the ecosystem is accessible to customers at the minimum digital literacy level represented in the service population. Wahyudi et al.'s (2025) finding that substantive stakeholder engagement rather than formal consultation is the variable that determines partnership quality applies here: genuinely engaging digitally limited customers requires designing for their tool preferences, not for the institution's operational convenience.

5. Implications for Maritime Educational Institutions

What strategies have been implemented by the business development division of STIP Jakarta to improve customer-based services?

The Business Development Division at STIP Jakarta has successfully implemented several digital strategies aimed at improving customer-based services. These strategies include:

Web-Based Service Delivery: A centralized, user-friendly platform for accessing information and services has been developed, offering stakeholders a comprehensive and easily accessible resource. This aligns with Kumar et al. (2023), who highlighted the importance of digital platforms in enhancing service quality and improving overall customer satisfaction.

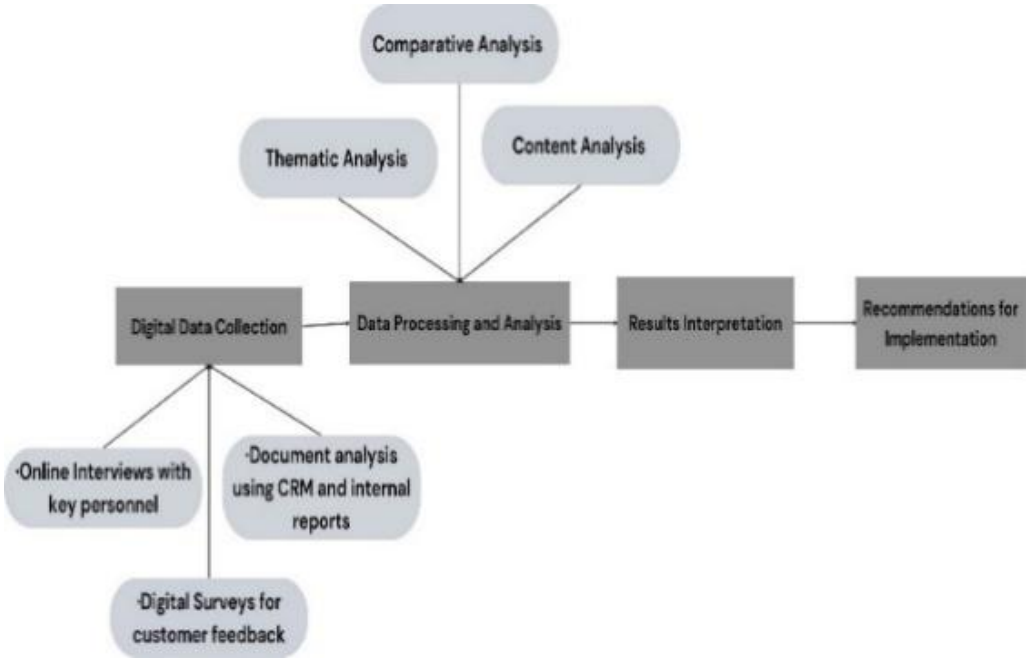

Figure 1. Division's Website

AI-Powered Chatbot: The institution has introduced a chatbot to handle basic inquiries and provide instant responses to customers, improving response times and reducing the reliance on human customer service agents. This strategy is consistent with the work of Taylor & James (2022), who emphasized how AI tools can predict and meet customer expectations proactively, improving service responsiveness.

Figure 2. Chat bot

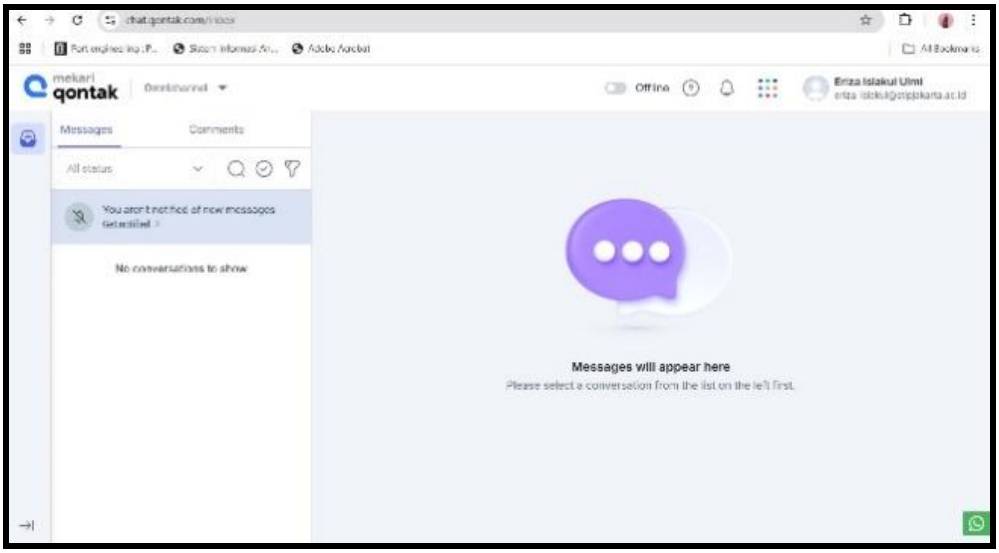

Figure 3. Division's WA

Figure 4. The queue machine

Figure 5. Service Counter

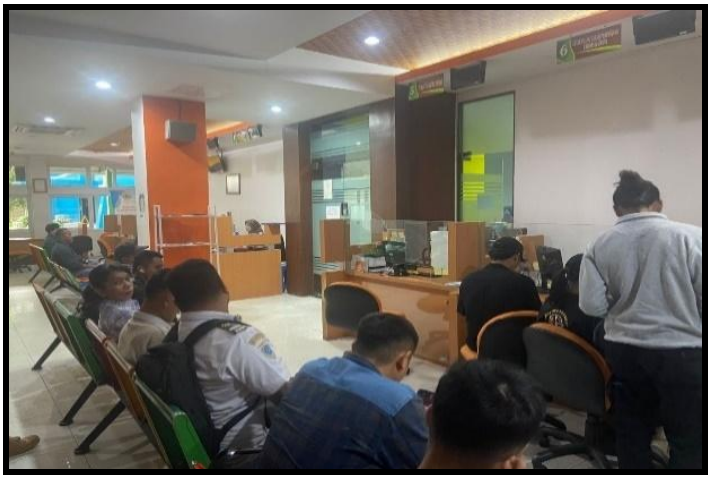

Figure 6. Google Form

Zoom Meetings for Personalized Interactions: To provide real-time and more personal interactions, STIP Jakarta adopted Zoom meetings, allowing direct consultations and fostering stronger relationships with students, alumni, and industry partners. This approach was also highlighted by Singh & Gupta (2022), who emphasized the role of digital technologies like video conferencing in maintaining close and responsive relationships with clients, especially during times when face-to-face meetings are not feasible. Zoom has been particularly useful for customers with lower digital literacy levels, as it offers an accessible platform for more personalized support, helping users navigate complex digital systems more effectively.

Three practical implications emerge from the findings. First, maritime polytechnics pursuing digital service transformation should explicitly map their tool deployment to SERVQUAL dimensions, ensuring that reliability, responsiveness, assurance, and empathy are each addressed by at least one dedicated tool rather than assuming that any digital investment uniformly improves all quality dimensions. Second, staff training investment must precede or accompany technology deployment the pattern of infrastructure-first, capacity-second that Othman et al. (2025) document as the most common TVET digitalization mode is precisely inverted by STIP Jakarta's approach, which the informant data identifies as a primary success factor. Third, institutions serving heterogeneous-digital-literacy customer populations must include synchronous, face-to-face-compatible tools (video consultation) alongside asynchronous digital channels, ensuring service equity for customers whose digital literacy does not match the dominant tool interfaces.

CONCLUSION

Answers to Research Questions

This study demonstrates that the Business Development Division of STIP Jakarta has implemented a coherent five-tool digital customer service ecosystem in which each tool addresses specific SERVQUAL service quality dimensions: the web platform and chatbot improve reliability and responsiveness; WhatsApp improves responsiveness and assurance; Zoom improves empathy and assurance; and satisfaction surveys provide the data feedback loop sustaining all dimensions. Implementation success is determined by three interacting factors technological infrastructure reliability, staff digital competency developed through pre-deployment training, and data-driven iteration enabled by monthly satisfaction survey analysis and is mediated by the digital literacy of the customer population served.

The study's principal theoretical contribution is its operationalization of SERVQUAL within a digital transformation framework for Indonesian maritime vocational higher

education demonstrating that the five service quality dimensions can guide tool selection and deployment architecture in educational digital transformation, providing a theoretically grounded design principle not previously articulated for this institutional context.

Practical Recommendations and Future Research

Maritime educational institutions pursuing digital service transformation are advised to adopt a tool-to-SERVQUAL-dimension mapping approach in which each digital investment is evaluated against the specific quality dimensions it improves, rather than against generic digital transformation adoption benchmarks. Staff training investment should precede customer-facing tool deployment as a non-negotiable sequencing requirement. Customer digital literacy assessment should inform tool ecosystem design, with synchronous video consultation included as a non-negotiable equity-ensuring component for institutions serving heterogeneous populations.

Future research should employ longitudinal designs tracking SERVQUAL dimension scores before, during, and after digital tool deployment to provide causal evidence for the dimension-specific improvements this study documents qualitatively. Comparative studies across multiple Indonesian maritime polytechnics would test the transferability of the five-tool ecosystem and the three-factor implementation model identified here. Research specifically examining how customer digital literacy can be developed as part of institutional service strategy rather than treated as a fixed constraint would address what this study identifies as the most significant remaining challenge for equitable digital service quality in maritime education.

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