JOURNAL OF ENGINEERING AND MANAGEMENT IN INDUSTRIAL SYSTEM VOL. X NO. X YEAR XXXX

e-ISSN 2477-6025
DOI 10.21776

Strategi Peningkatan Produktivitas Organisasi Pada Startup: Tinjauan Literatur

Anggi Anggraeni[1)], Bambang Santoso Haryono[2)], Endah Setyowati[3)]
Brawijaya University, Malang, Indonesia[1)]
Brawijaya University, Malang, Indonesia[2)]
Brawijaya University, Malang, Indonesia[3)]

Abstract
Penelitian ini bertujuan untuk mengidentifikasi model pengambilan keputusan manajerial yang relevan dalam organisasi startup serta menganalisis hubungannya dengan peningkatan produktivitas organisasi. Metode yang digunakan adalah Systematic Literature Review (SLR) dengan pendekatan kualitatif, mencakup sintesis berbagai literatur ilmiah dari basis data bereputasi internasional seperti Scopus, ScienceDirect, Springer, Emerald, IEEE Xplore, MDPI, dan Frontiers, dengan rentang publikasi tahun 2015–2025. Hasil kajian mengidentifikasi empat model pengambilan keputusan yang relevan untuk konteks startup: Rational Decision Model, Bounded Rationality Theory, Data-Driven Decision Making, dan Agile Decision Making. Masing-masing model memiliki karakteristik, kelebihan, dan keterbatasan yang berbeda dalam menghadapi kondisi ketidakpastian dan keterbatasan sumber daya yang menjadi ciri khas startup. Sintesis literatur menunjukkan bahwa kombinasi Data-Driven Decision Making dan Agile Decision Making merupakan strategi pengambilan keputusan yang paling direkomendasikan karena mampu menyeimbangkan kecepatan respons pasar dengan akurasi keputusan, sehingga berkontribusi terhadap peningkatan efisiensi operasional, kapasitas inovasi, dan produktivitas startup secara berkelanjutan. Penelitian ini memberikan kontribusi teoritis berupa kerangka konseptual integratif yang menjembatani tiga domain yang selama ini dikaji secara terpisah, yaitu manajemen startup, teori pengambilan keputusan, dan studi produktivitas organisasi, serta kontribusi praktis bagi manajer startup dalam merancang sistem pengambilan keputusan yang efektif di era digital.

Keywords: Produktivitas Organisasi, Startup, Pengambilan Keputusan Manajerial, Bounded Rationality, Agile Decision Making, Data-Driven Decision Making, Tinjauan Literatur Sistematis

1. Introduction

The Fourth Industrial Revolution has reshaped the delivery of public services across sectors, and higher education is no exception. Universities worldwide, including in Indonesia, are adopting digital platforms to improve the efficiency, accessibility, and quality of services for their stakeholders (Schwab, 2016). Digital transformation in higher education spans several domains, from online academic information systems and student administrative portals to e-learning platforms and digital communication channels between students, faculty, and administrative staff. In the Indonesian context, this shift has been reinforced by rapidly rising internet penetration among the student-age population, which has made web- and chat-based service channels a default

Cite this Article As …….
Paper Accepted : ……
Paper Published : ……

e-ISSN 2477-6025
DOI 10.21776

expectation rather than an optional convenience (Asosiasi Penyelenggara Jasa Internet Indonesia, 2024). Within education administration specifically, information and communication technology is increasingly treated as a core component of institutional management rather than merely a support tool (Mustari, 2023). Prior research confirms that the quality of digital academic services has a significant bearing on student satisfaction and loyalty (Pham et al., 2019), and the shift accelerated markedly during the COVID-19 pandemic, which pushed institutions to migrate services online within a short period, often outpacing the readiness of supporting infrastructure and governance arrangements (Limbu & Pham, 2023).

Several strands of recent empirical work motivate closer scrutiny of this relationship. Alterkait and Alduaij (2024) found that information quality is a primary predictor of student satisfaction with e-learning platforms, with instructor and learner quality strengthening that relationship. Ban et al. (2024), by contrast, showed that a high degree of digital integration does not automatically translate into satisfaction: when technological adoption outpaces institutional governance and human-resource readiness, it can instead generate dissatisfaction. In the Indonesian public sector specifically, Agustika et al. (2023) found that integrating previously separate educational information systems measurably improved perceived academic service quality, while Antasena (2024) reported similarly high satisfaction with a national e-government platform used by graduate students, underscoring that digital public services in Indonesia can achieve strong satisfaction outcomes even where governance frameworks remain in development. Read together, these studies

e-ISSN 2477-6025
DOI 10.21776

suggest that periodic, evidence-based evaluation of digital academic service quality is not a peripheral administrative exercise but a genuine institutional need.

Digital academic services are the operational expression of this broader digital transformation, covering the full range of student administrative processes, from study plan submission to thesis completion. The effectiveness of such services depends heavily on clear regulation of authority, procedure, and standards at every organizational level (Janssen & van der Voort, 2020), a point consistent with the broader public policy literature on how administrative dynamics are shaped by the interaction of regulation, implementation capacity, and institutional management (Nugroho, 2017). At the study program examined here, digital services are delivered through a combination of the campus academic information system, online forms, and manual procedures, without integration into a single platform, as documented in the program's official academic guidebook (Departemen Teknik Industri Fakultas Teknik Universitas Brawijaya, 2024). Internal satisfaction data collected by the program between 2023 and 2025 shows an encouraging upward trend on indicators such as service speed, facility quality, and ease of procedure; yet two structural issues persist beneath that trend. First, the program has not adopted an explicit standard operating procedure (SOP) governing digital service delivery, so day-to-day service execution remains largely ad hoc. Second, academic and administrative staff continue to show variable responsiveness to student needs through digital channels, a pattern consistent with what the literature terms "digital fatigue," the exhaustion that results from sustained, intensive exposure to digital communication demands.

Against this backdrop, the present

e-ISSN 2477-6025
DOI 10.21776

study asks: (1) What is the quality of digital academic services at the study program, as perceived by students across the five SERVQUAL dimensions? and (2) What follow-up measures can be identified to improve the quality of digital services going forward? The study aims to measure student satisfaction descriptively across the five SERVQUAL dimensions using three years of institutional survey data, and to translate the resulting pattern of strengths and weaknesses into actionable recommendations for the program's leadership, staff, and future researchers. Its contribution is twofold: theoretically, it extends the literature linking digital service quality, digital fatigue, and student satisfaction in a public higher education setting; practically, it offers program leadership an evidence base for prioritizing service-improvement investments.

2. Theoretical Framework

2.1 Service Quality Management in the Public Sector

Public service quality management is concerned with ensuring that services delivered by public institutions meet the needs and expectations of the citizens who use them (Sinambela, 2014). Classical management theory frames this as a function of planning, organizing, staffing, and controlling directed toward institutional objectives (Hasibuan, 2016), and applied specifically to education administration, effective service delivery depends on management practices that translate policy into consistent day-to-day operations (Usman, 2014). Public policy scholarship adds that the quality of implementation, not merely the quality of the policy document itself, ultimately determines whether a service reform succeeds (Nugroho, 2008). Within this tradition, the New Public Service (NPS) paradigm reframes citizens not as customers to be satisfied transactionally

e-ISSN 2477-6025
DOI 10.21776

but as stakeholders whose interests public institutions exist to serve (Denhardt & Denhardt, 2015). Three NPS principles are especially relevant to a university's digital academic services: "Serve Citizens, Not Customers," which calls for treating students as members of an institution with rights and needs to be attended to holistically; "Value Citizenship over Entrepreneurship," which holds that public interest is better served by staff committed to meaningful public contribution than by a narrowly transactional, output-driven orientation; and "Think Strategically, Act Democratically," which emphasizes collaborative processes between service providers and recipients in shaping policy improvement. These principles provide an interpretive lens for reading satisfaction data not merely as a performance score, but as an indicator of the underlying service relationship between an institution and its students.

2.2 The SERVQUAL Model

The SERVQUAL model, developed by Parasuraman, Zeithaml, and Berry (1985, 1988), remains the most widely used framework for assessing service quality. It organizes service quality into five dimensions: tangibles (the appearance of physical facilities, equipment, and communication materials), reliability (the ability to perform the promised service dependably and accurately), responsiveness (willingness to help customers and provide prompt service) (Lupiyoadi, 2013), assurance (the knowledge and courtesy of staff and their ability to inspire trust and confidence), and empathy (the provision of caring, individualized attention to service users that reflects genuine understanding of each customer's specific needs) (Parasuraman et al., 1988; Zeithaml et al., 1990; Tjiptono, 2014). In its original formulation, SERVQUAL measures the

e-ISSN 2477-6025
DOI 10.21776

gap between customer expectations and perceived performance, and satisfaction is understood as the evaluative response that follows a comparison between prior expectations and actually experienced performance (Tjiptono & Chandra, 2016). In digital and higher-education contexts specifically, tangibles is more usefully read as the quality and reliability of digital infrastructure (information systems, online forms, and communication channels) rather than physical facilities alone (Alenezi, 2023).

2.3 Digital Fatigue and Service Responsiveness

A growing body of work links intensive, unplanned digitalization of work to psychological strain among staff. Molino et al. (2020) show that the abrupt shift to remote, technology-mediated work during the pandemic carried wellbeing costs for staff that can, in principle, translate into reduced service quality. Related evidence on the use of instant-messaging platforms such as WhatsApp for institutional communication indicates that while such channels increase accessibility, they also raise the volume and immediacy of demands placed on staff, a dynamic with the potential to erode responsiveness over time if not actively managed (Kasim et al., 2022; Zheng et al., 2022). Studies specifically situated in Indonesian higher education reinforce this concern: WhatsApp has become a dominant channel for academic communication precisely because of its convenience and immediacy (Zakirman & Rahayu, 2018), and its group-based use has been shown to shape student participation patterns in ways that also increase the volume of informal communication staff are expected to monitor and respond to (Salsabila et al., 2025).

2.4 Prior Empirical Studies on Academic Service Quality

Several Indonesian studies have

e-ISSN 2477-6025
DOI 10.21776

applied SERVQUAL, often in its Importance-Performance Analysis (IPA) variant, to academic administrative services. Sigiyuwanta et al. (2023) assessed SERVQUAL-based satisfaction with academic administrative services in a public administration department, while Hana and Yuamita (2024) combined IPA and SERVQUAL to evaluate academic services at a private industrial engineering program. Closest in scope to the present study, Safira et al. (2023) applied SERVQUAL directly to digital academic services and likewise found overall satisfaction to be high while identifying infrastructure-related dimensions as comparatively weaker than staff-related dimensions, a pattern this study revisits with three years of longitudinal data. Munthe et al. (2024) and Yaqub and Alsabban (2023) both emphasize that digital information systems function as enablers of service quality only when adoption is matched by integration and by adequate staff readiness; fragmented, non-integrated systems tend to depress precisely the dimensions most tied to infrastructure, namely tangibles and responsiveness. Taken together, this literature suggests that satisfaction gains from digitalization are not automatic: they depend on the degree to which digital channels are consolidated, standardized, and supported by adequately resourced staff, the same structural conditions identified as the point of departure for the present study.

2.5 Conceptual Framework

Building on this literature, the study conceptualizes student satisfaction as the outcome of digital academic service quality across nine measured service items, which are in turn shaped by two contextual factors identified in the institutional background: the absence of an explicit digital SOP and the risk of digital fatigue among academic and administrative staff. The nine items are

e-ISSN 2477-6025
DOI 10.21776

mapped onto the five SERVQUAL dimensions as shown in Table 1. Because the analysis relies on an official, performance-based satisfaction instrument rather than a purpose-built gap instrument, the model treats student satisfaction as an absolute performance measure rather than an expectation–performance gap, a scope condition discussed further in Section 6.

Table 1

Mapping of SERVQUAL Dimensions to Survey Items

SERVQUAL Dimension	Service Item (Questionnaire)	Item No.
Reliability	Consistency of service requirements with the type of service delivered	1
Reliability	Consistency between the service product and the actual result delivered	5
Empathy	Ease of service procedure	2
Empathy	Fairness of service fees/tariffs	4
Empathy	Staff attitude and friendliness in service delivery	7
Responsiveness	Speed of service completion	3
Responsiveness	Handling of complaints, suggestions, and feedback	9
Assurance	Staff competence in service delivery	6
Tangibles	Quality of facilities and infrastructure	8

3. Methodology

3.1 Research Design

This study uses a descriptive, quantitative, non-parametric design. Descriptive quantitative research aims to portray a phenomenon systematically, factually, and accurately based on measured data (Sugiyono, 2023). A non-parametric approach was selected because the satisfaction data are ordinal (1–4) and do not satisfy the normal-distribution assumptions required for parametric statistics.

3.2 Research Site, Population, and Sample

The study was conducted at the Industrial Engineering study program, Faculty of Engineering, of a public university in East Java, Indonesia. This site was purposively selected because the program has implemented a mix of

e-ISSN 2477-6025
DOI 10.21776

digital service channels (an academic information system, online forms, and manual procedures), because three consecutive years of internal satisfaction data (2023–2025) were available for analysis, and because the researcher had direct access to program-level records. The study population comprised undergraduate students from the 2023, 2024, and 2025 cohorts who had used the program's digital academic services for at least one full semester. A total (census) sampling technique was used: every student whose response was recorded in the program's official Student Satisfaction Survey during this period was included, yielding 539 respondents in 2023, 13 in 2024, and 539 in 2025. Total sampling was chosen to maximize representativeness and avoid the selection bias that a partial sample might introduce (Sugiyono, 2023); the resulting imbalance across years is addressed as a limitation in Section 6.

3.3 Data Source and Instrument

The study relies on secondary data drawn from the study program's official Student Satisfaction Survey, an instrument already established and routinely administered by the program rather than constructed for this study. Because the instrument is a standardized tool in continuous institutional use, its validity and reliability are treated as institutionally established. The questionnaire comprises nine service items rated on a four-point ordinal scale (1 = dissatisfied, 2 = somewhat dissatisfied, 3 = satisfied, 4 = very satisfied), covering: (1) consistency of service requirements, (2) ease of service procedure, (3) speed of service, (4) fairness of fees/tariffs, (5) consistency of the service outcome with what was promised, (6) staff competence, (7) staff attitude and friendliness, (8) quality of facilities and infrastructure, and (9) handling of complaints, suggestions, and

e-ISSN 2477-6025
DOI 10.21776

feedback. These nine items were mapped onto the five SERVQUAL dimensions for analysis (Table 1). Secondary documentary data, including internal satisfaction reports, institutional regulations governing digital academic services, and relevant scholarly literature, were used to contextualize and triangulate the primary survey data.

3.4 Data Analysis Technique

Data were analyzed descriptively by computing the mean score for each item, aggregating item-level means into dimension-level grand means, and classifying the resulting scores using a Likert interval scale. The interval width was calculated as (maximum score − minimum score) / number of scale points = (4 − 1) / 4 = 0.75, yielding the four satisfaction categories shown in Table 2. Analyses were conducted using standard spreadsheet and statistical software to compute frequency distributions and mean scores per item, per dimension, and per year.

Table 2

Likert Interval Categorization of Satisfaction Scores

Score Interval	Satisfaction Category
1.00 – 1.75	Very Dissatisfied
1.76 – 2.51	Dissatisfied
2.52 – 3.27	Satisfied
3.28 – 4.00	Very Satisfied

Table 3

Operational Definitions of the SERVQUAL Dimensions in This Study

Dimension	Operational Definition
Reliability	The consistency between the requirements and outcomes promised by the digital service and the outcomes actually received by students.
Empathy	The extent to which service procedures, fees, and staff attitudes reflect individualized attention to student needs rather than uniform, impersonal processing.
Responsiveness	The willingness and speed of the study program and its staff to complete service requests and address complaints, suggestions, and feedback.
Assurance	The competence and technical ability of staff, which underpins student trust in the institution.
Tangibles	The perceived quality and adequacy of the digital infrastructure used to deliver services (information systems, digital forms, communication channels).

e-ISSN 2477-6025
DOI 10.21776

4. Result and Discussion

Table 4 summarizes the year-by-year and grand-mean scores for each SERVQUAL dimension. All five dimensions, and the overall grand mean, fall within the "very satisfied" interval (3.28–4.00), and every dimension shows a consistent upward trend across the three years, with no year-on-year decline on any dimension.

Table 4

Mean Satisfaction Scores by SERVQUAL Dimension, 2023–2025

Dimension	2023	2024	2025	Grand Mean	Category
Reliability	3.21	3.57	3.95	3.57	Very Satisfied
Empathy	3.25	3.51	3.88	3.54	Very Satisfied
Responsiveness	3.09	3.46	3.91	3.50	Very Satisfied
Assurance	3.22	3.60	3.93	3.58	Very Satisfied
Tangibles	3.19	3.40	3.86	3.48	Very Satisfied
Overall (Grand Mean)	3.19	3.51	3.91	3.53	Very Satisfied

4.1 Reliability

Reliability, measured through consistency of service requirements and consistency of service outcomes, achieved a grand mean of 3.57, the second-highest of the five dimensions. Both items rose steadily across the study period, indicating that the actual performance of the service increasingly met or exceeded student expectations over time (Indrawati, 2022). This result is notable given the structural conditions described in Section 1: despite the absence of an explicit SOP and the fragmentation of service channels, students consistently perceived the information published on each digital channel as clear and the resulting outcomes as consistent with what was promised. This suggests that the dissatisfaction risks associated with an ad hoc governance model have, to date, been contained mainly within the responsiveness and tangibles dimensions rather than spilling over into reliability.

e-ISSN 2477-6025
DOI 10.21776

Because this favorable outcome currently rests on the informal initiative of individual staff rather than on a codified standard, it should be treated as a foundation to formalize, through an explicit SOP and channel integration, rather than as a self-sustaining achievement (Munthe et al., 2024; Yaqub & Alsabban, 2023).

4.2 Empathy

Empathy, measured through ease of procedure, fairness of fees, and staff friendliness, produced a grand mean of 3.54. The ease-of-procedure item rose from 3.16 in 2023 to 3.90 in 2025, one of the largest gains recorded in the study, suggesting a process of mutual adaptation in which both students and staff became more proficient with the available digital channels over time. The fee-fairness item, which taps students' sense of procedural fairness (Sinambela, 2014), likewise improved sharply, while the staff-friendliness item, arguably the most direct indicator of empathy in the SERVQUAL sense of individualized attention (Parasuraman et al., 1988), also trended upward. Taken together, these results run counter to what the digital-fatigue literature might predict: sustained, high-volume digital communication is associated with reduced staff patience and responsiveness to individual needs (Kasim et al., 2022; Zheng et al., 2022), yet no such erosion is visible in the empathy trend. This is consistent with the NPS principle of "Serve Citizens, Not Customers" (Denhardt & Denhardt, 2015): student-oriented service values appear to have been informally internalized in day-to-day staff practice even without a codified SOP. That informality is itself a vulnerability, however, since empathy sustained by individual initiative alone is unlikely to hold as student numbers and service complexity grow, absent deliberate workload management and

e-ISSN 2477-6025
DOI 10.21776

communication-skills training for staff (Molino et al., 2020).

4.3 Responsiveness

Responsiveness, measured through service speed and complaint handling, recorded the second-lowest grand mean (3.50). Its starting value in 2023 is the most telling data point in the study: service speed scored 2.96 that year, the only item in the entire dataset to fall below the "very satisfied" threshold, corroborating the internal 2023 satisfaction data that first flagged service speed as a structural weak point. The subsequent rise to 3.91 by 2025, an increase of nearly one full scale point, indicates real improvement, plausibly driven by additional service staff, streamlined verification steps, or growing staff familiarity with high service-request volumes. Nonetheless, responsiveness remains one of the two lowest-scoring dimensions overall, and its trajectory is precisely what the study's background problem would predict: without an explicit SOP defining response-time standards and escalation procedures, response speed depends on individual staff initiative and is therefore vulnerable to disruption during peak periods, such as concurrent course-registration and thesis-submission windows. This is also the dimension most directly exposed to the digital-fatigue risk documented by Molino et al. (2020): sustained digital workload without adequate infrastructure or training support is associated with elevated staff strain and, potentially, declining service performance.

4.4 Assurance

Assurance, measured through a single item (staff competence), achieved the highest grand mean of the five dimensions (3.58), rising steadily from 3.22 in 2023 to 3.93 in 2025 without any year-on-year dip. This is a striking result: even amid the structural limitations identified in the study's background,

e-ISSN 2477-6025
DOI 10.21776

students consistently regarded staff as competent and trustworthy. It suggests a dissociation between institutional service governance, which remains under-standardized, and individual staff competence, which is consistently well regarded. This pattern aligns with the NPS principle of "Value Citizenship over Entrepreneurship" (Denhardt & Denhardt, 2015): high assurance scores can be read as evidence of staff members' professional commitment operating independently of, and to some extent compensating for, incomplete institutional infrastructure. Because assurance is measured through a single item, however, this result should not be generalized to the full conceptual scope of assurance in SERVQUAL theory, which also encompasses matters such as data security and the legal standing of digitally issued documents (Lovelock & Wirtz, 2011; Alenezi, 2023), aspects not captured by the current instrument.

4.5 Tangibles

Tangibles, measured through a single item on facility and infrastructure quality, recorded the lowest grand mean among the five dimensions (3.48), and also the lowest starting value of any item in 2023 (3.19). In a digital-service context, tangibles is better understood as the perceived quality of digital infrastructure (the academic information system, online forms, and communication channels) than as physical facilities (Alenezi, 2023; Rahman et al., 2023). The low 2023 baseline mirrors the structural issue documented in Section 1: services fragmented across multiple unconnected platforms require students to repeat administrative steps across different applications, which plausibly depresses perceived infrastructure quality even when each individual platform functions adequately. The subsequent rise to 3.86 by 2025 indicates genuine infrastructure improvement, yet tangibles

e-ISSN 2477-6025
DOI 10.21776

remains the slowest-improving dimension relative to the more interpersonal dimensions. This is consistent with the view that digital technology functions as an enabler of service quality only when its adoption is matched by integration; fragmented adoption limits the benefits students can actually realize (Yaqub & Alsabban, 2023).

4.6 Overall Pattern: Interpersonal Trust Outpaces System Trust

Ranked from highest to lowest, the five dimensions read: assurance (3.58), reliability (3.57), empathy (3.54), responsiveness (3.50), and tangibles (3.48), a narrow range of only 0.10 points, indicating that the dimensions are relatively homogeneous rather than sharply differentiated. Even within that narrow range, however, a consistent pattern emerges: dimensions tied to direct human interaction and individual staff competence (assurance, reliability, empathy) outperform dimensions tied to system speed and technical infrastructure (responsiveness, tangibles). This pattern indirectly supports the premise motivating the study: students' confidence in staff goodwill and competence currently exceeds their confidence in the institution's digital governance readiness. Practically, it means that whatever satisfaction gains the program has achieved to date have been driven disproportionately by individual staff effort rather than by institutional systems, a foundation that is real, but structurally fragile.

4.7 Limitations

Several limitations should inform how these findings are interpreted. First, the instrument used is a standardized, performance-based questionnaire already in routine institutional use; it was not designed to measure the expectation–performance gap central to the conventional SERVQUAL model (Parasuraman et al., 1988; Zeithaml et al.,

e-ISSN 2477-6025
DOI 10.21776

1990). The "very satisfied" categorization reported here therefore reflects absolute perceived performance rather than a gap score, limiting direct comparability with gap-based studies (Hana & Yuamita, 2024; Sigiyuwanta et al., 2023).

Second, the assurance and tangibles dimensions are each measured through a single item, which may not fully represent the broader theoretical scope of these constructs, such as data security, the legal standing of digitally issued documents, or platform stability (Lovelock & Wirtz, 2011; Alenezi, 2023). Findings on these two dimensions should be interpreted cautiously.

Third, the number of respondents is markedly unbalanced across years (539 in 2023, 13 in 2024, and 539 in 2025). The small 2024 sample may affect the representativeness of that year's mean and should be borne in mind when reading the apparently smooth upward trend across the three years.

Fourth, the analysis is purely descriptive; it does not include inferential testing of the differences observed between items, dimensions, cohorts, or years. Apparent differences, for example between the highest- and lowest-scoring dimensions, or between cohorts, should therefore be read as descriptive patterns rather than statistically confirmed effects.

Fifth, the study was conducted at a single study program, limiting generalizability to other programs or institutions with different service characteristics, student populations, and levels of digital maturity (Amoako et al., 2023; Nepal et al., 2024). The two contextual factors motivating the study, the absence of a digital SOP and staff digital fatigue, were used as an interpretive frame rather than measured directly, so their causal relationship with satisfaction outcomes has not been empirically established here.

Sixth, because the data are secondary, the

e-ISSN 2477-6025
DOI 10.21776

researcher had no control over the original data-collection process, including survey timing, respondents' understanding of individual items, or potential response bias arising from mandatory or rushed completion, even though the instrument is institutionally regarded as valid and reliable based on its routine use.

5. Conclusion

This study set out to measure student satisfaction with digital academic services at an Industrial Engineering study program across the five SERVQUAL dimensions, and to identify follow-up measures for service improvement. Overall, digital academic service quality falls into the "very satisfied" category, with a combined grand mean of 3.53 on a 4-point scale, and every dimension improved consistently from 2023 to 2025 without exception. Assurance and reliability, dimensions rooted in staff competence and consistency, scored highest, while tangibles and responsiveness, dimensions rooted in system infrastructure and speed, scored lowest, though still within the "very satisfied" range. This pattern indicates that students' trust in the goodwill and competence of individual staff currently outpaces their confidence in the institution's digital governance and infrastructure, a finding directly traceable to the structural conditions identified at the outset of the study: the absence of an explicit SOP for digital services and the fragmentation of service channels across multiple platforms.

The practical implication is that although current satisfaction levels are strong, they rest on a foundation that is more individual than institutional, and therefore more fragile than the headline scores suggest. Codifying an explicit SOP, consolidating fragmented service channels into an integrated portal, and actively managing staff digital workload are the most direct levers available to convert today's favorable but informally sustained performance into a durable institutional standard. Future research

e-ISSN 2477-6025
DOI 10.21776

applying gap-based SERVQUAL instruments, inferential statistical testing, and multi-institutional designs would strengthen the evidence base for these conclusions and extend their relevance beyond the single program examined here.

Referensi

[1] arXiv. (2019). Agile organizational decision making in dynamic environments. arXiv preprint.

[2] arXiv. (2025). AI adoption in NGOs: A systematic literature review. arXiv preprint.

[3] Blank, S. G. (2007). The four steps to the epiphany: Successful strategies for products that win. K&S Ranch Press.

[4] Blank, S. G. (2013). Why the lean start-up changes everything. Harvard Business Review, 91(5), 63–72.

[5] Bortolini, R. F., Cortimiglia, M. N., Danilevicz, A. M. F., & Ghezzi, A. (2018). Lean startup: A comprehensive historical review. Management Decision, 59(8), 1765–1783.

[6] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101.

[7] Business Case Studies. (2025). Organizational productivity: Definition and importance. Business Case Studies.

[8] BusinessMap. (2023). Organizational productivity trends in the digital era. BusinessMap Blog.

[9] Camuffo, A., Cordova, A., Gambardella, A., & Spina, C. (2024). A scientific approach to entrepreneurial decision making: Large-scale replication and extension. Strategic Management Journal, 45(1), 83–113.

[10] Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. MIS Quarterly, 36(4), 1165–1188.

[11] Daft, R. L. (2000). Management (6th ed.). The Dryden Press.

[12] Data Journal. (2025). Big data analytics and business intelligence: Improving decision-making speed and quality. Data Journal.

[13] Demandsage. (2025). Startup failure rate statistics 2025. Demandsage.

[14] Digital Transformation and Society. (2024). Digital transformation as a catalyst for productivity. Digital Transformation and Society, 3(2), 112–128. Emerald Publishing.

[15] Drury-Grogan, M. L. (2014). Performance on agile teams: Relating iteration objectives and critical decisions to project management success factors. Information and Software Technology, 56(5), 506–515.

[16] EMAN Research. (2025). AI and predictive analytics in organizational decision making. EMAN Research Journal.

[17] Emerald. (2023). Strategic

e-ISSN 2477-6025
DOI 10.21776

management processes and decision-making styles. Emerald Insight.

[18] EQ4C. (2024). Limitations of the rational decision-making model. EQ4C Business Solutions Blog.

[19] Fiveable. (2024). Heuristics and bounded rationality in decision making. Fiveable AP Psychology Resource.

[20] Frontiers in Psychology. (2024). Managerial decision making and organizational performance: A systematic review. Frontiers in Psychology, 15, Article 1349812.

[21] Hessari, H., & Nategh, T. (2022). Human resources as the most important factor in organizational productivity. Journal of Human Resource Management, 10(2), 45–58.

[22] Hiebl, M. R. W. (2023). Sample selection in systematic literature reviews of management research. Organizational Research Methods, 26(2), 229–261.

[23] iCert Global. (2023). Managerial decision making: Types and levels of decision. iCert Global.

[24] IEEE. (2021). Startup lifecycle models: From conception to maturity. IEEE Xplore.

[25] IJRIAS. (2025). Decentralized decision making in agile organizations. International Journal of Research and Innovation in Applied Science, 10(1).

[26] IJRSI. (2023). Resource allocation and organizational productivity: A review. International Journal of Research and Scientific Innovation.

[27] IJSOC. (2025). Success factors of agile decision making in startup teams. International Journal of Social Sciences and Organizational Communication.

[28] IOSR Journal. (2025). Digital tools and agile decision-making in modern organizations. IOSR Journal of Business and Management, 27(3).

[29] Kalantari, H. D. (2010). Bounded rationality in decision making. KnowledgeBrief.

[30] Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. Harvard Business Review, 70(1), 71–79.

[31] Keka Academy. (2026). Efficiency vs. effectiveness: Understanding the difference in organizational context. Keka HR.

[32] Koziol-Nadolna, K., & Beyer, K. (2021). Determinants of the decision-making process in organizations. Procedia Computer Science, 192, 2375–2384.

[33] Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. International Entrepreneurship and Management Journal, 16(3), 1023–1042.

[34] Kraus, S., Breier, M., Jones, P., & Hughes, M. (2023). How to conduct systematic literature reviews in management research: A guide in 6 steps and 14 decisions. Review of Managerial Science, 18, 1–36.

[35] Lei, X., Liu, Q., Zheng, J., & Zhou, W. (2023). Digital transformation and

e-ISSN 2477-6025
DOI 10.21776

total factor productivity: Evidence from Chinese listed companies. Heliyon, 9(11), e21349.

[36] MDPI Sustainability. (2023). Innovation capacity and resource allocation in startup organizations. Sustainability, 15(4), 3210.

[37] Nguyen-Duc, A., Seppänen, P., & Abrahamsson, P. (2021). Startup research: Systematic mapping of the literature. Journal of Software: Evolution and Process, 33(2), e2292.

[38] Nucci, A., Pozzolo, A. F., & Scarano, G. (2023). Digitalization and firm productivity: Heterogeneous effects across firms. Structural Change and Economic Dynamics, 65, 186–201.

[39] Porter, M. E. (1985). Competitive advantage: Creating and sustaining superior performance. Free Press.

[40] Product School. (2025). Agile decision making for startup teams: Speed, iteration, and validation. Product School Blog.

[41] ResearchGate. (2021). Startups: A systematic review of literature — bibliometric analysis 1970–2023. ResearchGate.

[42] ResearchGate. (2024). Data-driven decision making and business intelligence in modern organizations. ResearchGate.

[43] Revli. (2025). Startup failure statistics: Operational inefficiency as key factor. Revli.

[44] Ries, E. (2011). The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Crown Business.

[45] Runn. (2025). Efficiency vs. productivity: What every manager needs to know. Runn.io.

[46] Sage Journal. (2021). Pivot as a strategic response: Dynamic flexibility in startup decision making. Journal of Business Venturing Insights, 15, e00225.

[47] Sanasi, S., & Ghezzi, A. (2022). Exploring pivoting in startups: A longitudinal case study. Review of Managerial Science, 16(4), 1123–1159. Springer.

[48] Scaled Agile Framework. (2026). Lean-agile decision making: The SAFe approach to fast and validated learning. SAFe 6.0.

[49] Schwarz, G. M., Bouckenooghe, D., & Vakola, M. (2022). Organizational change failure: Framing the process. Human Relations, 74(2), 159–179.

[50] ScienceDirect. (2018). KPI-based performance measurement in organizational management. International Journal of Production Economics, 200, 1–14.

[51] ScienceDirect. (2025). Using thematic analysis in qualitative research: A methodological guide. Methodological Innovations, 18(1).

[52] Simsek, Z., Fox, B. C., & Heavey, C. (2023). Systematicity in organizational research literature reviews: A framework and assessment. Organizational Research Methods, 26(2), 200–228.

[53] Simon, H. A. (1955). A behavioral model of rational choice. Quarterly

e-ISSN 2477-6025
DOI 10.21776

Journal of Economics, 69(1), 99–118.

[54] Simon, H. A. (1997). Administrative behavior: A study of decision-making processes in administrative organizations (4th ed.). Free Press.

[55] Springer. (2024). Satisficing and bounded rationality: Conceptual and practical implications. Springer Encyclopedia of Management.

[56] Springer. (2025). Review of data-driven growth and agile decision making in startups. Review of Managerial Science, 19(1), 45–78.

[57] Study.com. (2013). The rational decision-making model: Steps and purpose. Study.com.

[58] Suurmaa, L. (2024). Data-driven decision making in startups: Practical applications and organizational challenges [Master's thesis]. Aalto University.

[59] Tandfonline. (2024). Human resource management and organizational productivity: A meta-analysis. The International Journal of Human Resource Management, 35(3), 214–238.

[60] Tandfonline. (2025). Decision quality, process alignment, and operational efficiency. Journal of Organizational Behavior, 46(2).

[61] The Happy Manager. (2021). Advantages and disadvantages of the rational decision-making model. The Happy Manager.

[62] TheMBA Institute. (2023). Types of managerial decisions: Strategic, tactical, and operational. TheMBA Institute.

[63] Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. BMC Medical Research Methodology, 8(1), 45.

[64] Unterkalmsteiner, M., Abrahamsson, P., Wang, X., Nguyen-Duc, A., Shah, S., Bajwa, S. S., ... & Yagüe, A. (2016). Software startups: A research agenda. e-Informatica Software Engineering Journal, 10(1), 89–123.

[65] Varma, T. M., & Dutta, D. K. (2023). Startups as a distinctive organizational form: Revisiting and extending current perspectives. Dalam L. Suurmaa (2024), Data-driven decision making in startups [Master's thesis]. Aalto University.

[66] Wierenga, B. (2011). Managerial decision making in marketing: The next research frontier. International Journal of Research in Marketing, 28(2), 89–101.

[67] XCalibre Training. (2025). The seven steps of the managerial decision-making process. XCalibre Training Blog.

[68] XtendedView. (2026). Why startups fail: Top causes and statistics 2026. XtendedView.

[69] Zell, D., Glassman, A. M., & Duron, S. (2007). Strategic leadership during financial crisis: Results from a study of the 500 largest U.S. firms. Organizational Dynamics, 36(1), 38–52. Dikutip dalam eCampus Ontario Open Textbook.