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Evaluation of Time-to-Delivery and Identification of Delay Factors in B2B Internet Services

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ABSTRACT

This research addresses the problem of delayed B2B internet service installations at PT Telkom Indonesia Witel Jakarta Barat, which fails to meet the regulatory requirement of 95% on-time completion within a seven-day service-level agreement (SLA ≤ 7 days) as stipulated in Ministry Regulation No. 15/2013. An evaluation of 3,394 orders in Q1 2024 revealed only 90.20% on-time completion, highlighting the need for process improvement. The objective of this study is to identify bottlenecks, streamline the installation *value stream*, and enhance SLA compliance through the integration of Value Stream Mapping (VSM) and *Kaizen* methodologies. Using VSM, the study identified 140 hours of value-added time (VA-time) spread across the site-survey, cable-pulling, and activation stages, with more than half lost due to scheduling delays and material shortages. *Kaizen* initiatives—including the digitalization of technician scheduling, standardized work-order formats, and regular 5S audits—successfully reduced VA-time to 7 hours, achieving a 95% efficiency rate in the future-state process. Simulation of the improved process demonstrated SLA compliance exceeding 97% and a noticeable reduction in customer complaints. Furthermore, warehouse and fleet 5S audit scores, indicating better orderliness and safety. These findings imply that the combined VSM–*Kaizen* approach effectively eliminates non-value-adding activities, accelerates service delivery, and ensures regulatory compliance, offering a replicable model for operational improvements in the telecommunications industry.

Keywords: *internet delivery, delay, Kaizen, Value Stream Mapping*

INTRODUCTION

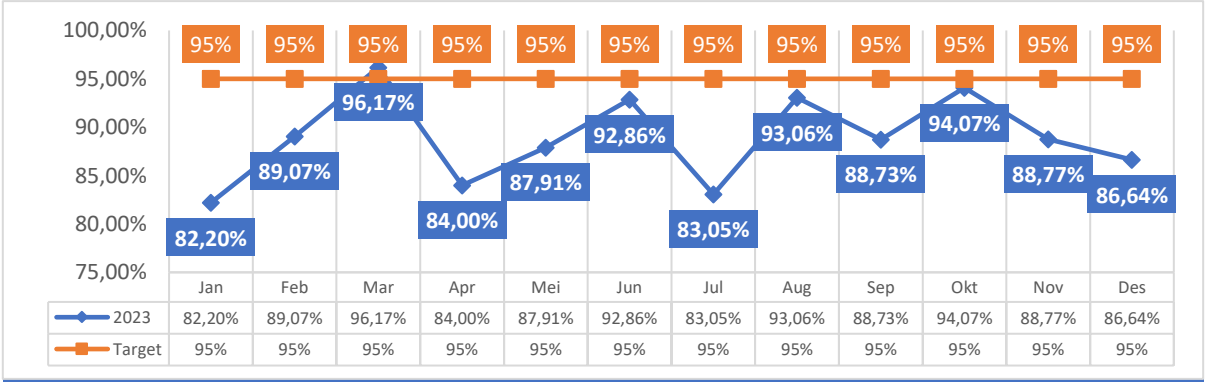
Internet is an abbreviation of *Interconnected Network*. The definition of the internet refers to an independent network of computers connected to each other. The internet consists of millions of computers connected via specific protocols, allowing them to communicate with one another (Rachmijati, 2018). The use of the internet has many benefits in daily life, such as communication, information retrieval, educational access, and facilitating work tasks (Oliveira & Filho, 2020). The numerous benefits derived from internet access have made the majority of people reliant on it. This is evidenced by data from BPS (*Badan Pusat Statistik*, Statistics Indonesia), which recorded an increase in internet usage from 2018 to 2022.

Based on this data, it can be concluded that the demand for internet access or internet delivery has increased each year. This increased demand is not only seen in mobile phone users but also in households. Internet access has now shifted from being a secondary need to a primary necessity. Telecommunication service providers now not only offer mobile phone services but also provide internet services for households and/or offices that use wired networks. To meet the demand for reliable internet, the provision of wired internet is still considered to have greater potential compared to wireless or mobile internet provision (Lone et al., 2018).

The competition between internet service providers is becoming increasingly intense, as they compete to deliver the best customer satisfaction. This competition involves not only marketing programs but also supporting better digitalization in the internet delivery *value stream* (Anjani, 2018). Pre-delivery or internet delivery is crucial, as the quality of internet service provided impacts customer perceptions of the product's value (Joudeh & Dandis, 2018). Several stages must be considered in the internet delivery process, such as the quality and availability of the internet network in a given area. This is done to ensure that the internet installation process runs smoothly, from installation to minimizing potential customer complaints in the future (Cornejo et al., 2020).

This research focuses on the internet delivery segment B2B (Business to Business), which is treated differently from B2C (Business to Consumer). In the B2B segment, the treatment is based on the larger financial usage compared to B2C, so customer loyalty is essential to build greater future investments. Currently, there is still a gap between the realization of internet service delivery time in the B2B segment and the new installation standards set by KOMDIGI. Based on data from PT Telkom Indonesia's Witel West Jakarta, it was found that the percentage of time to delivery under 7 days is still 89.13%, while the standard set by the Ministry of Communication and Informatics is 7 days, and the delivery rate must be above 95% of all received requests. This shows that in the last three months, PT Telkom Indonesia in the West Jakarta Witel region has not met the standard outlined in Regulation No. 15/2013 of the Ministry of Communication and Informatics. Therefore, it is necessary to analyze the causes of delays in the time delivery of services.

Compilance Time to delivery 2023



	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Des
2023	82,20%	89,07%	96,17%	84,00%	87,91%	92,86%	83,05%	93,06%	88,73%	94,07%	88,77%	86,64%
Target	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Source: author (2024)

The researcher compares the current delivery times, which still do not meet the 95% standard within 7 days, in 2023. The focus of this study is to analyze and continuously improve the internet delivery *value stream* to meet customer needs. The first step is to analyze the main causes of the delays in time to delivery, followed by continuous improvement using *Kaizen* and Value Stream Mapping (VSM) methods to achieve optimal results. This research focuses on one provider in Indonesia, PT Telkom Indonesia, which operates in the West Jakarta region.

Previous studies have shown that the implementation of *Kaizen* and the seven tools reduces product defects, and *Kaizen* can also improve cost-effectiveness (Pratama et al., 2023; Sahri & Novita, 2019). Other studies found that applying Value Stream Mapping (VSM) and *Kaizen* can reduce disturbance handling time and improve service efficiency, as well as increase stable bandwidth speed, which in turn improves customer satisfaction (Anjani, 2018; Nugroho

& Jaqin, 2017). A study conducted by the Directorate of Airworthiness and Aircraft Operations using VSM showed that it could reduce total lead time by 69%, from 94.5 days to 29.5 days (Ikatrinasari & Haryanto, 2014; Nusraningrum & Priyono, 2018). Other studies found that well-managed business processes and guaranteed quality can increase customer satisfaction (Dharma Putra & Nusraningrum, 2022; Nusraningrum et al., 2020).

Based on previous research, the analysis of time to delivery internet to support business digitalization in the B2B segment using *Kaizen* and Value Stream Mapping methods at PT Telkom Indonesia Witel West Jakarta needs to be conducted.

The objective of this research is to determine the time and percentage of Time to Delivery (TTD) within seven days after implementing process improvements in the internet delivery workflow at PT Telkom Indonesia Witel West Jakarta. The benefits of this research are multifaceted. Theoretically, it contributes to the literature on the application of *Kaizen* and VSM in the telecommunications sector, specifically in accelerating B2B internet installations. Methodologically, the study develops a systematic approach to integrate VSM and *Kaizen* for process improvement. Practically, it provides actionable strategies to enhance delivery efficiency, comply with government regulations, and increase customer satisfaction by reducing complaints. Empirically, it highlights that 9.8% of installations in Q1 2024 exceeded the SLA, offering insights into root causes that can inform future corrective measures. From a social and policy perspective, the findings support digital transformation initiatives by enabling faster and more reliable internet installations in line with national digitalization goals.

METHOD

The research design used in this study was descriptive, employing a mixed-methods approach that combined quantitative and qualitative methods. The study aimed to analyze the time to delivery of internet services and implement continuous improvements using the *Kaizen* and Value Stream Mapping (VSM) methods. The qualitative approach involved using checksheets and Focus Group Discussions (FGDs) to evaluate improvements made in reducing delays in installation time for the B2B segment at PT Telkom Indonesia Witel West Jakarta.

Two main variables were used in the study. The independent variable was Time to Delivery (TTD), representing the duration required to fulfill customer installation requests. The dependent variable was delay, measured by the number of orders completed beyond the standard SLA of seven working days. These operational definitions facilitated identifying and analyzing the relationship between TTD and service delays, forming the basis for process improvement.

The population included all B2B segment customers of PT Telkom Indonesia Witel West Jakarta who were part of the calculation for unmet Time to Delivery for internet services in 2023. The total population consisted of 3,394 installation services recorded during that period. A purposive sampling technique was employed, with the sample comprising 369 customer orders that experienced installation delays of more than seven days. This sampling method was selected to focus on cases that did not meet the SLA, providing clearer insights into the root causes of delays.

RESULTS AND DISCUSSION

Overview of Research Objects

This research was conducted at Witel West Jakarta, which is one of the operational units under PT Telkom Indonesia, responsible for providing telecommunications services and digital solutions in the West Jakarta area. As an integral part of Telkom Regional II, Witel West Jakarta plays a strategic role in serving various customer segments, ranging from individuals (B2C) to corporations (B2B). The organizational structure of Witel West Jakarta is led by a General Manager, supported by 7 Unit Managers who focus on their respective areas.

Witel West Jakarta has a very promising market potential. With a population of 2.4 million people, along with approximately 28 thousand people from the Thousand Islands, and more than 800 thousand households, the area offers significant opportunities for the development of telecommunications and digital services. Its operational area covers 8 districts and 56 villages, with a primary focus on 251 strategic locations, including 85 apartment complexes and 166 premium clusters. The established infrastructure serves as a strong foundation for delivering telecommunications solutions that cater to both retail and business needs, especially in densely populated areas and premium housing developments.

From an economic perspective, the average income of residents in this area is IDR 2.7 million per month, with variations depending on education levels. Most buildings in the area are privately owned (49%), while the rest are rented or leased (35%). Additionally, West Jakarta is home to many small and medium enterprises (SMEs) across various sectors, including manufacturing, automotive trade, and accommodation services. This creates significant opportunities to provide digital services that support the growth of SMEs and local businesses.

Furthermore, West Jakarta has highly potential sectors for development. There are over 2,000 schools and 33 universities in the education sector, nearly 1,000 healthcare facilities, 28 large industries, and 798 medium-sized industries. For tourism and lifestyle, the area hosts 173 hotels, 70 restaurants, and 32 malls that attract large numbers of visitors. With diverse needs and comprehensive infrastructure, Witel West Jakarta is strategically positioned to expand telecommunications and digital solutions for both individual and corporate customers. With a commitment to innovation and service excellence, Witel West Jakarta continues to support digital transformation in various sectors, strengthening its position as the key partner in meeting the telecommunications and information technology needs of the West Jakarta community (Anjani, 2018).

Sample data description

This research uses secondary data collected over a one-year observation period in 2023, with a total of 3,394 services. Of these, 3,025 services (89.13%) were successfully delivered within 7 days, while 369 services (10.87%) took more than 7 days to be delivered. Data was obtained from the Xpro (Excellent Provisioning) IT tool, used by PT Telkom Indonesia for monitoring daily, monthly, and yearly provisioning orders in real-time. The data collected covers total customers from January to March 2023, with 3,394 services delivered.

Table 1. Compilance & Delayed 2023

Month	Realitation Time			Delay			
	Summary Order	Average of TTI ALL	Percentage	Summary Order	Average TTI > 7 Days	Delay Real - Target (7Days)	Percentage
Jan	382	4.03	82.20%	68	15.353	8.353	17.80%
Feb	247	3.24	89.07%	27	15.516	8.516	10.93%
Mar	261	1.77	96.17%	10	11.489	4.489	3.83%
Apr	150	3.79	84.00%	24	16.336	9.336	16.00%
Mei	215	3.29	87.91%	26	14.464	7.464	12.09%
Jun	266	2.57	92.86%	19	10.923	3.923	7.14%
Jul	236	3.81	83.05%	40	10.648	3.648	16.95%
Aug	346	2.53	93.06%	24	10.305	3.305	6.94%
Sep	284	3.88	88.73%	32	16.930	9.930	11.27%
Okt	371	2.54	94.07%	22	11.857	4.857	5.93%
Nov	374	3.10	88.77%	42	13.089	6.089	11.23%
Des	262	3.67	86.64%	35	12.239	5.239	13.36%
Grand Total	3394	3.15	89.13%	369	13.570	6.570	10.87%

Source: author (2024)

From this, the average time to delivery from January to December 2023 was analyzed, with monthly volumes ranging from 150 orders (April) to 382 orders (January). The average Time to Install (TTI ALL) ranged from 1.77 days (March) to 4.03 days (January), with the percentage of orders completed on time (TTI ≤ 7 days) ranging from 96.17% (March) to 82.20% (January). The annual average TTI was 3.15 days, with SLA compliance of 89.13%, indicating that most orders were completed within the specified timeframe. Meanwhile, the sample of delays consisted of 369 orders (10.87% of the total) that required more than 7 days for completion. For this group, the average delay TTI was 13.57 days, with a deviation of 6.57 days from the SLA target. Monthly delays ranged from 10 orders (March) to 68 orders (January), with the lowest TTI for delayed orders at 10.31 days (August) and the highest at 16.93 days (September), with the real vs. target gap varying from 3.31 days to 9.93 days. Seasonal patterns revealed peaks in delays during the first quarter and in July, while March and October showed the best performance in reducing delays. This provides a quantitative basis for analyzing the root causes and operational improvement recommendations. Data collection was performed through PT Telkom Indonesia's internal IT tool, Starclick, which is a Geographic Information System (GIS)-based application developed by PT Telkom Indonesia. This web-based application facilitates customer device data entry, supports communication via phone calls, and enables direct surveys with customers. The service delivery process is divided into three phases: First, the customer request is recorded as "Pre-registered" on October 20, 2023, at 15:52 WIB, followed by "Create Order" and "Create Account." Second, the survey and provisioning phase begins when the status changes to "Provisioning Start" on October 20, 2023, at 15:54 WIB, and ends with "Provisioning Issued" on October 26, 2023, at 19:53 WIB, taking about 148 hours, which became the main bottleneck. Third, the activation process is much quicker: after "Provisioning Completed," the system reaches "Activation Complete" on October 27, 2023, at 08:58 WIB, and is marked as "Completed" at 09:42 WIB on the same day, with a total activation time of only 14 hours. The fact that the survey and provisioning phase took significantly longer than activation highlights that the main bottleneck lies in the provisioning phase. Therefore, this study focuses on reconstructing events during this phase

and visualizing the time-to-delivery sample from 2023, which had an average of 6.57 days or 150.96 hours, using Value Stream Mapping to identify process improvement opportunities.

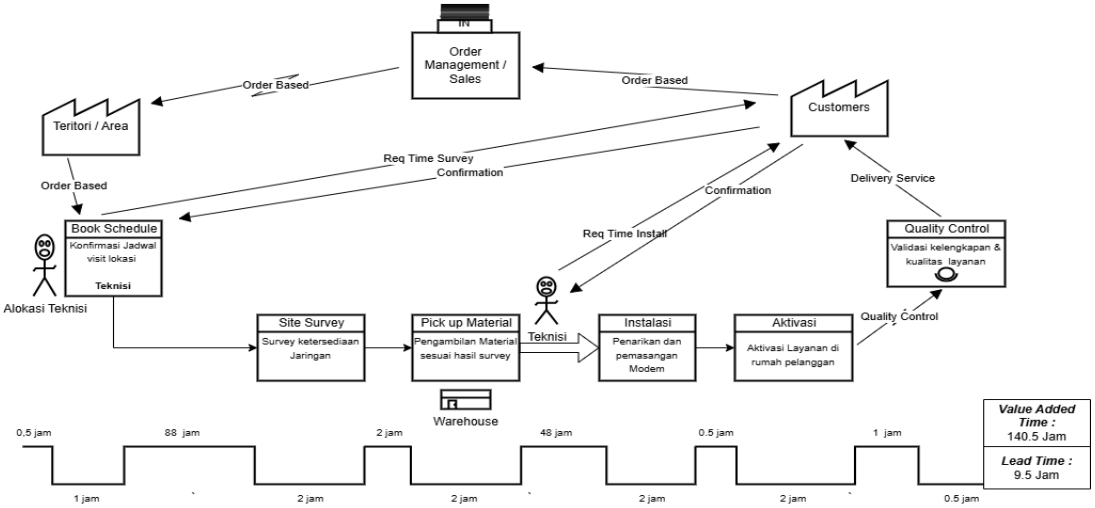


Figure 1. Current Value Stream Mapping

Source: author (2024)

Analysis of Delay Factors

To identify the factors causing delays in internet network installation at Witel West Jakarta, the researcher conducted a Focus Group Discussion (FGD) to determine the main causes of delays, which were then analyzed using the 5M + 1E principle. Based on the analysis with relevant stakeholders, only 4M + 1E factors were considered, namely:

1) Man (Human)
2) Machine (Equipment)
3) Method (Procedure)
4) Material (Raw Materials)
5) Environment (Surroundings)

The discussion results from the FGD with stakeholders as key informants produced a fishbone diagram as follows.

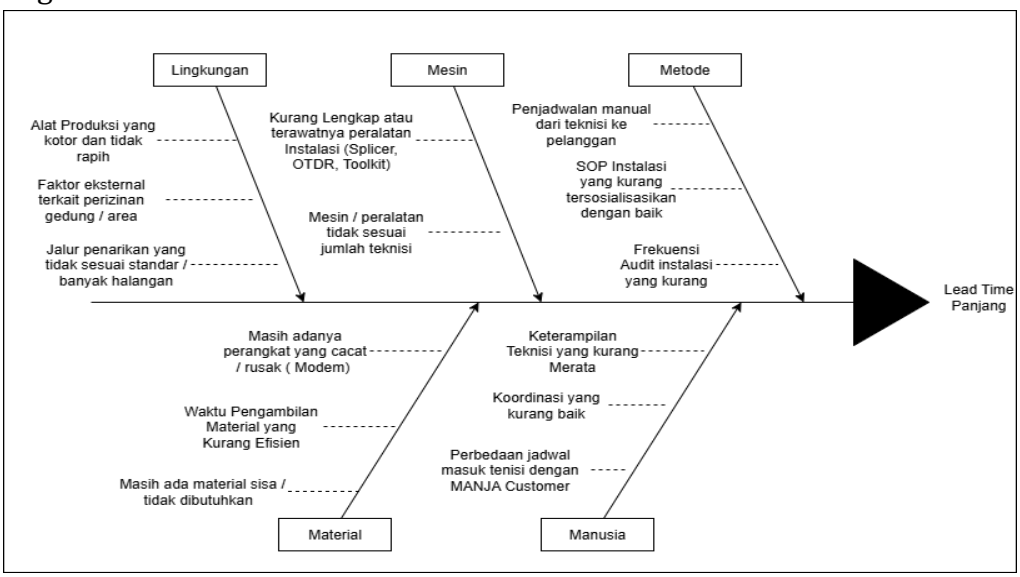


Figure 1. Fishbone Diagram

Source: author (2024)

Based on the analysis of the main causes of delays and the creation of the fishbone diagram, this research will proceed with the application of the Kaizen method, specifically using 5S checksheets and a scoring system to measure, monitor, and continuously improve each of the factors above. Through the checksheet, the researcher will record daily conditions in the areas of Sort, Set in Order, Shine, Standardize, and Sustain, while the quantitative scoring system will provide an objective assessment of technicians' adherence to SOPs, equipment and material readiness, and the cleanliness and organization of the worksite.

Improvement Recommendations

Table 1. Improvement Recommendation Table

No	Factor	5W + 1H	Item Kaizen 5S & Score	Plan Kaizen 5S (Seiri→Shitsuke)
1	*Man*	**What**: Technician skills are inconsistent → rework & scheduling conflicts. **Why**: Uneven training & certification; KPI prioritizes quantity. **Where**: Jakarta Barat site – survey & cable pulling. **When**: Q I 2023. **Who**: Technicians, coordinators, HR-LC, WFM. **How**: Matrix of skills, training schedule, CRM↔WFM integration, KPI skill index.	• **Shitsuke-2** "Discipline 5S" = 1 (Poor) • **Shitsuke-3** "Audit FGD" = 3 (Fair) • **Seiketsu-3** "SOP Team" = 1 (Poor)	**Seiri:** separate training modules. **Seiton:** dashboard for skills/e-learning library. **Seiso:** periodic skill audit. **Seiketsu:** national SOP certification. **Shitsuke:** skill-based KPI & reward system.
2	*Machine*	**What**: Splicer/OTDR/toolkits incomplete/untracked. **Why**: No asset management system & outdated SOP. **Where**: Warehouse & calibration lab – Jakarta Barat. **When**: Pre-survey & installation. **Who**: WH staff, QA, asset team, techs, ops manager. **How**: Asset barcode system, calibration schedule, equipment dashboard..	• **Seiso-2** "Cleaned equipment" = 1 (Poor) • **Seiso-5** "Clean area before/after" = 3 (Fair) • **Seiton-2** "Special tools arranged" = 2 (Average)	**Seiri**: discard obsolete/broken tools. **Seiton**:prepare "ready-to-use" code rack. **Seiso**: cleaning checklist template. **Seiketsu**: SOP with QR labels. **Shitsuke**: monthly 5S audit & warehouse incentive.
3	*Method*	**What**: Manual scheduling errors; unclear priority. **Why**: SOP not well understood; audit not standardized. **Where**: Office & Jakarta Barat field. **When**: 2024–Q1 2025. **Who**: Tech coordinators, QA **How**: CRM automation, SOP dissemination, 5S audit.	• **Seiketsu-1** "Installation procedure clarity" = 3 (Fair) • **Seiketsu-2** "Installation checklist use" = 1 (Poor) • **Shitsuke-1** "5S audit /mo" = 2 (Average)	**Seiri**: archive outdated SOPs; avoid duplication. **Seiton**: SOP repository version control. **Seiso**: review & update every 90 days. **Seiketsu**: audit checklist template; mandatory training. **Shitsuke**: monthly audit process; OKR ≥ 90%.
4	*Material*	**What**: Defective equipment mixed with usable stock; slow picking. **Why**: No barcode/FIFO; delayed digital WH. **Where**: FO material WH – Jakarta Barat. **When**: Pre-installation Q1 2024–2025. **Who**: WH staff, SCM, techs, IT-logistics. **How**: Barcode, WH go-live module, inspection SOP.	• **Seiri-2** "Cables/modems separated" = 3 (Fair) • **Seiri-4** "Damaged materials grouped" = 2 (Average) • **Seiton-1** "Cables neatly arranged" = 3 (Fair)	**Seiri**: separate return/NG stock. **Seiton**: use FIFO + min-stock. **Seiso**: area cleaning checklist. **Seiketsu**: SOP label-barcode standard. **Shitsuke**: daily patrol, WH KPI accuracy.
5	*Environment*	**What**: Permit delays due to access blocks & messy zones.	• **Seiso-1** "Clean installation area" = 3 (Fair)	**Seiri**: remove access barriers.

No	Factor	5W + 1H	Item Kaizen 5S & Score	Plan Kaizen 5S (Seiri→Shitsuke)
		Why: Permit process unclear; SOP not displayed. **Where**: High-rise buildings/public areas – Jakarta Barat. **When**: Site survey & cable pulling 2024–2025. **Who**: Techs, legal, building mgmt, customer PIC. **How**: Coordination for permit, SOP updates, site map.	• **Seiton-4** "Cables arranged neatly" = 2 (Average)	**Seiton**: install route map & permit board. **Seiso**: daily clean-up 5 min. **Seiketsu**: standardized permit template. **Shitsuke**: daily safety-cleanliness briefing; weekly audit.

Source: author (2024)

Future Value Stream Mapping

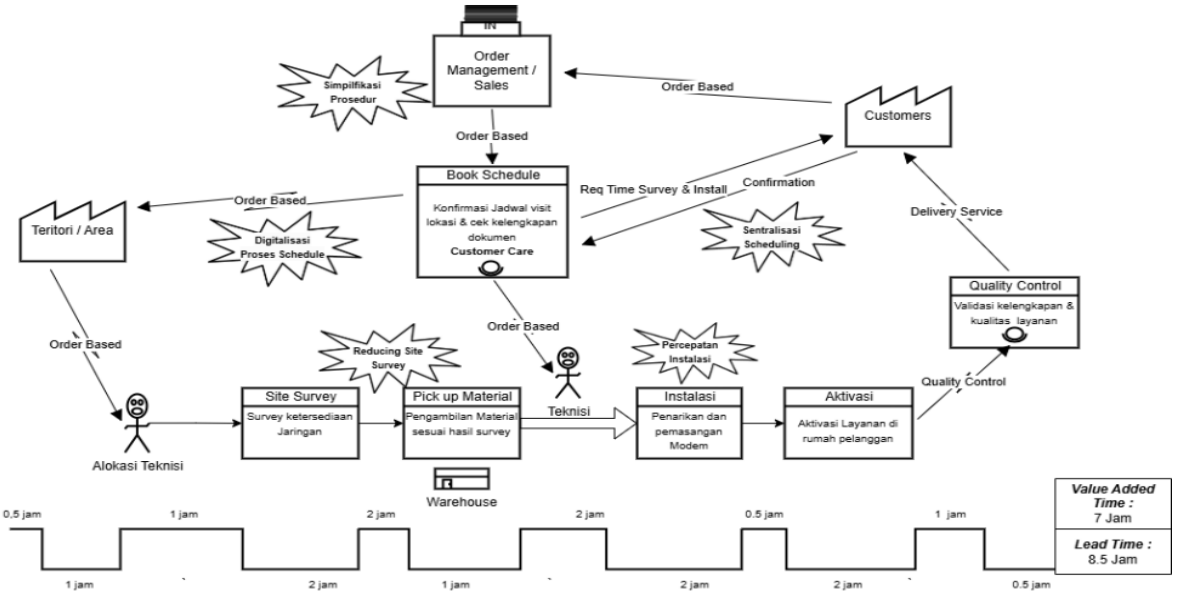


Figure 1. Future Value Stream Mapping

Source: author (2024)

A comparison between the Current State Value Stream Map (CVSM) and the Future State Value Stream Map (FVSM) shows a huge improvement in process efficiency after the implementation of improvements. The Book Schedule stage still takes 0.5 hours, but it is now more accurate and reliable thanks to the implementation of scheduling automation. The Site Survey stage recorded a significant reduction in time, from 72 hours to just 1 hour, achieving an efficiency of 98.61% through the use of digital survey tools and more effective technician allocation.

The Material Pick Up process has also become more efficient, with the time reduced from 2 hours to 1 hour, as a result of the standardization and automation of material picking. At the Installation stage, the time was successfully reduced from 48 hours to 2 hours, with an efficiency of 95.83%, thanks to technician training, centralized or digital scheduling, and more optimal use of work tools. The Activation stage still takes 0.5 hours, but the implementation of the automatic checklist significantly reduces misconfigurations. Quality Control, although it still takes 1 hour, becomes more reliable with the digitization of the validation process. Overall, Lead Time is drastically reduced, reflecting increased efficiency at each stage. The implementation of these measures not only saves time, but also improves the accuracy and quality of service. The efficiency level of Future Value Stream Mapping (FVSM) can be described in the following table.

Table 2. Comparison of Value Added Time between CVSM & FVSM (Translated)

Process Stage	VA in CVSM (Hours)	VA in FVSM (Hours)	Time Reduction (Hours)	Improvement (%)
Book Schedule	0.5	0.5	0	0
Site Survey	88	1	87	98.86
Pick Up Material	2	2	0	0
Installation	48	2	46	95.83
Activation	0.5	0.5	0	0
Quality Control	1	1	0	0
Total	**140**	**7**	**133**	**95**

Source: author (2024)

The table shows a comparison between the time spent at each stage of the process based on the Current State Value Stream Map (CVSM) and the Future State Value Stream Map (FVSM), as well as the efficiency achieved after improvement. The Book Schedule stage still takes 0.5 hours with no change in efficiency, while the Site Survey shows a significant reduction in time from 72 hours to 1 hour, with efficiency reaching 98.86% thanks to the use of digital tools and better allocation of technicians. Pick Up Material also experienced an increase in efficiency by 50%, with time reduced from 2 hours to 1 hour through process standardization. At the Installation stage, the time was successfully reduced from 48 hours to 2 hours, achieving an efficiency of 95.83% thanks to technician training and optimization of work tools. The Activation and Quality Control stages do not show any change in time, they still take 0.5 hours and 1 hour, respectively, but the process becomes more reliable through the implementation of automated checklists and digitization of validation. Overall, this table illustrates a significant reduction in processing time at several key stages, which has a positive impact on efficiency and quality of service.

Comparison after repair

After a series of studies that have been carried out, the researcher compared the 2023 observation year before the improvement and with the observation year in 2024 and obtained several results, among them.

New Business Process

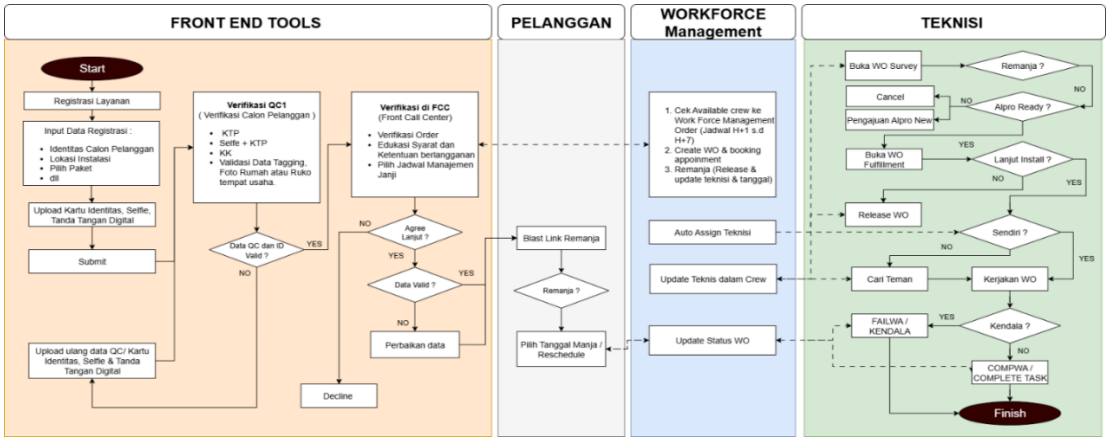


Figure 3. Business Process Delivery Internet

Source: author (2024)

Comparison Graph 2023 & 2024

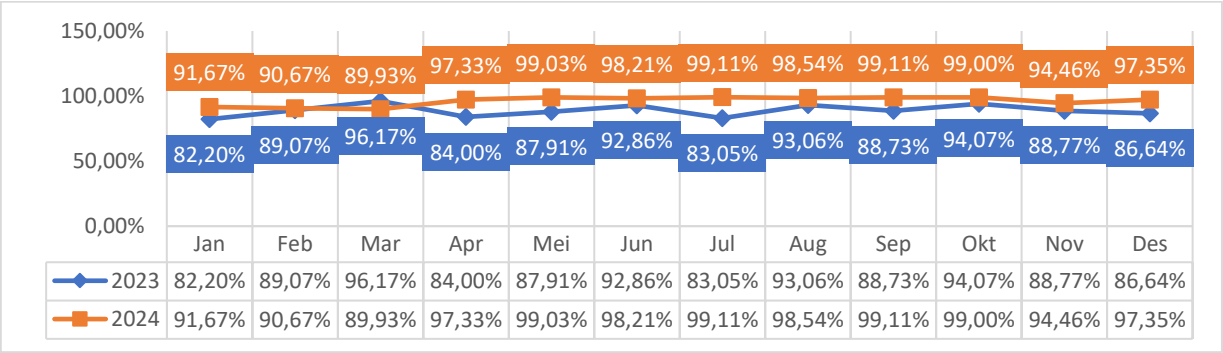


Figure 4. Improvement TTD 2023 & 2024

Source: author (2024)

The data above illustrates the achievement of Time to Delivery (TTD), which is the percentage of orders completed in 7 working days for 2023 and 2024, with a compliance target of ≥ 95%. Each point on the chart shows the proportion of orders that meet the ≤ 7 business day due in the month.

In 2023, compliance with the 7-day deadline will only exceed the target once, namely in March (96.17%). On the other hand, the other 9 months including January (82.20%), February (89.07%), and July (83.05%) were recorded below the 95% threshold. This indicates that there are still many installations that take longer, so they have not consistently met TTI standards.

Entering 2024, there will be a surge in achievements: from April (97.33%) to October (99.00%), monthly achievements are consistently above 95%, with the highest peak in September (99.11%). Although January-March and November (94.46%) were still below the target, overall 8 out of 12 months have achieved compliance, showing a noticeable improvement compared to 2023.

This significant improvement is driven by the adoption of the latest business processes as reflected in the latest business processes ranging from the digitization of registration and automatic verification of QC1/FCC, CRM integration for customer self-scheduling, to automation of technician assignments and reporting through the Workforce Management system. The transformation of manual processes into automation is what systemically cuts installation lead times and ensures more orders are completed within the 7 business days limit.

Discussion

This study provides an in-depth understanding of how the application of Kaizen, and Value Stream Mapping (VSM) is able to significantly improve the time to delivery in B2B segment service installations in West Jakarta Region. The findings of this study identify several important implications as follows:

Determine the time and percentage of Time to Delivery (TTD) ≤ 7 days after repair

The measurement results show a significant increase in the performance of TTD fulfillment ≤ 7 days jumping from an average of 89.13% in 2023 to 95.8% throughout 2024, even reaching 99.11% in September after the improvement program was implemented. This achievement closes the gap to the 95% threshold required by the Minister of Communication and Communication Regulation No. 15/2013 and confirms the findings of Nugroho & Jaqin (2017) that the acceleration of Kaizen + VSM-based services has a direct effect on increasing telecommunication customer satisfaction. In addition, process efficiency is seen in the

reduction of value-added time (VA-time) from 140 hours to just 7 hours (saving 133 hours or 95%) on the future value stream map (FVSM), in line with international evidence that VSM is able to cut lead-time by up to 80–90% in service (Kumar et al., 2018; Zahoor et al., 2019).

Identify the factors causing the delay

The fishbone 4M+1E analysis highlights five root problems: (a) Man—inconsistency of technician skills and schedule overlap; (b) Machine— inconsistent availability and calibration of splicers and OTDRs; (c) Method—manual scheduling and SOPs that have not been evenly understood; (d) Materials—the stock of defective devices mixed with the deserving; and (e) Environment—building access permits and work area cleanliness that hinder efficiency. This pattern of resistance is in line with the concept of waste (young) in Lean and the findings of Sahri & Novita (2019) regarding the importance of HR involvement and process discipline to suppress time deviation. Cepeda-Carrión et al. (2023) also affirm that any service delay has a direct impact on the perception of B2B customer value.

Evaluate and implement delay management methods

The combination of Kaizen 5S and Value Stream Mapping proved to be the most effective. VSM maps the Current State to highlight non-value-added activities, while Kaizen 5S triggers 27 remedial actions (tool structuring, material barcodes, monthly 5S audits, and scheduling digitization). The 5S audit score rose from 2.0 (adequate) to 3.4 (good) in three cycles, especially on the Seiton and Shitsuke pillars. Extreme efficiency in the Site Survey (88 → 1 hour) and Installation (48 → 2 hours) stages shows the synergy of Kaizen theory of continuity improvement (Theresia et al., 2022) with the visual approach of VSM (Trimarjoko et al., 2020). In addition to lowering VA-time, the integration of Customer-Relationship-Management (CRM) and workforce-management automatically closes administrative gaps, supporting the discourse of digitization of the B2B value chain raised by Ritter & Pedersen (2020) and Rodríguez et al. (2020).

CONCLUSION

In 2023, PT Telkom Indonesia Witel West Jakarta processed 3,394 B2B installation orders but completed only 89.13% within the seven-day SLA, falling short of the 95% regulatory threshold, with January and July showing the poorest performance and delayed orders averaging 13.57 days. This systemic issue was addressed in 2024 through the integrated implementation of *Kaizen*, which led to eight consecutive months of SLA compliance between 97.33% and 99.11%, raising the annual average to 95.8% and surpassing regulatory standards. This improvement coincided with a 95% reduction in total value-added time—from 140 to 7 hours—mainly by dramatically shortening the Site Survey and Installation phases. The outcomes included reduced overtime and rework, consistent regulatory compliance, avoidance of penalties, enhanced customer satisfaction, and new up-selling opportunities. Future research is suggested to explore the scalability of this integrated *Kaizen*-VSM approach across other regions and service types, as well as its long-term sustainability and impact on customer retention.

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