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EFFICIENCY IN HR: LEAN MANAGEMENT WITH E-SEP AND AUTO CLOSING SYSTEM IN PASAR MINGGU HOSPITAL

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Abstract. *The study focuses on enhancing efficiency in outpatient transactions at Pasar Minggu Hospital, which, in 2019, experienced a high volume of visits primarily covered by national health insurance. With 299,041 outpatient visits using national health insurance that year, the hospital's transition to a COVID-19 referral facility in 2020 underscored the urgency of streamlining operations. Presently, outpatient transactions are manually closed by three staff members, led by the financial administrator, who handles Participant Eligibility Letter files, resolves transaction issues, and finalizes services. Given the imperative for digitization accelerated by the pandemic, the study adopts lean thinking, employing a value stream map (VSM) to identify and optimize value-added activities. Interventions include implementing an electronic Participant Eligibility Letter system and a transaction auto-closing mechanism. The findings indicate a substantial reduction in human resource requirements by two personnel and a streamlined process, saving up to 67 minutes. Besides, this intervention solved two main problems such as the potential of missing manual SEP files and very long transaction in financial administration. This research highlights the efficacy of lean management principles, emphasizing the importance of hospital information system enhancements for outpatient services. By leveraging electronic documentation and automated processes, Pasar Minggu Hospital demonstrates a tangible improvement in operational efficiency amidst evolving healthcare demands.*

Keywords: *Lean management, Outpatients, Casemix, Hospital information system*

Abstrak. Penelitian ini berfokus pada peningkatan efisiensi transaksi pasien rawat jalan di Rumah Sakit Pasar Minggu. Pada tahun 2019, rumah sakit ini mengalami lonjakan kunjungan, sebagian besar ditanggung oleh asuransi kesehatan nasional. Dengan 299.041 kunjungan pasien rawat jalan menggunakan asuransi kesehatan nasional, transisi rumah sakit menjadi fasilitas rujukan COVID-19 pada tahun 2020 menekankan urgensi penyempurnaan proses transaksi di rawat jalan. Saat ini, transaksi pasien rawat jalan ditutup secara manual oleh tiga staf, dipimpin oleh administrator keuangan, yang menangani berkas kelayakan peserta (SEP), menyelesaikan masalah transaksi, dan menyelesaikan layanan. Dengan mendesaknya digitalisasi akibat pandemi, penelitian ini mengadopsi *lean thinking*, menggunakan peta aliran nilai/ *value stream map* (VSM) untuk mengidentifikasi dan mengoptimalkan aktivitas yang bernilai tambah. Intervensi meliputi implementasi sistem Surat Kelayakan Peserta elektronik dan mekanisme penutupan otomatis transaksi. Temuan menunjukkan penurunan signifikan dalam kebutuhan sumber daya manusia sebesar dua personil dan proses yang lebih efisien, menghemat hingga 67 menit. Selain itu, intervensi ini juga menyelesaikan dua masalah utama yaitu kemungkinan berkas yang hilang dan durasi yang sangat panjang di bagian administrasi keuangan. Penelitian ini menyoroti efektivitas prinsip manajemen *lean*, dengan menekankan pentingnya peningkatan sistem informasi rumah sakit untuk layanan rawat jalan. Dengan memanfaatkan dokumentasi elektronik dan proses otomatis, Rumah Sakit Pasar Minggu menunjukkan peningkatan efisiensi operasional yang nyata di tengah tuntutan perubahan dalam layanan kesehatan.

Kata kunci: Manajemen lean, Rawat jalan, Casemix, Sistem informasi rumah sakit

INTRODUCTION

In 2019, over 90% of outpatients at Pasar Minggu Hospital, a type B non-educational government-owned public hospital, utilized the National Health Insurance / Jaminan Kesehatan

Nasional (JKN). The outpatient visits numbered 29,941 with an average of 24,920 visits per month. Patients seeking treatment with JKN providers required a participant eligibility letter (SEP) as proof of outpatient service acceptance, issued at registration and submitted to the doctor at the polyclinic.

This study concentrated on the outpatient department's claim process, managed by the billing section under the Fund Mobilization Unit. Three employees formed the outpatient administration team, responsible for receiving manual SEP files from polyclinic nurses post-service completion, closing transactions in the system, identifying incomplete transactions, and sharing data with coders for Ina-CBGs coding. An issue commonly encountered was discrepancies between the number of SEP files and patients served, often due to files being misplaced or piled with other documents-additionally, a backlog of SEP documents accumulated in the Fund Mobilization unit, lacking proper storage.

Graban (2018) highlights the effectiveness of Lean in addressing hospital challenges due to its ability to include detailed processes, assign tasks appropriately, optimize workflow efficiency, enable leaders to recognize and address systemic issues within the hospital effectively and facilitate continuous learning and professional development among employees. Lean thinking principles focus on improving customer service quality by enhancing service flow and eliminating waste. These principles include defining and mapping the value from the patient's perspective and the value stream to eliminate non-value-added steps, ensure smooth process flow, and eliminate delays. They allow customers to pull services as needed rather than push them through the system. Striving for continuous improvement to achieve perfection. (Liker,J. 2006)

Value, as emphasized by Joosten (2009), is paramount in lean thinking, defined by the ability to deliver desired products or services efficiently and cost-effectively. Waste, identified by Graban (2018), encompasses activities that do not contribute to patient care and must be eliminated. McManus (2012) further elaborates on waste in healthcare, highlighting its prevalence and impact on patient care and staff productivity. (Nadjib, M. 2017)

Vincent Gasperz's acronym, DOWNTIME, encapsulates various forms of waste, including defects, overproduction, waiting, underutilization of employee skills, transportation, inventory, motion, and excess processing. Lean methodologies, such as Kanban, 5S, Kaizen, Error Proofing, and Visual Management, are instrumental in waste reduction and process optimization. Continuous improvement is achieved through the PDCA cycle (Plan-Do-Check-Act), ensuring ongoing refinement and efficiency enhancement. (Husna, M. 2017)

In 2020, Pasar Minggu Hospital became the primary referral for COVID-19 cases, prompting digitization efforts, including in the billing department. Researchers advocated for optimizing outpatient claims management via a hospital information system to repurpose human resources for more critical tasks. They viewed the manual transfer process as a Lean tool and intended to explore lean methodologies such as electronic SEPs and outpatient transaction auto closing systems to enhance billing processes and human resource efficiency. This research aimed to assess whether these systems could reduce processing time and optimize human resources. The study's focus was on evaluating the value of financial administration officers' activities.

METHOD

The research utilized operational research methods, adopting a qualitative approach with a focus on lean management principles. It was conducted within the billing unit of Pasar Minggu Public Hospital over a period from October to November 2021, with one month allocated for data collection. Observations were made on five distinct processes, commencing with the nurse's collection of SEP documents and their handover to the billing staff, known as the financial administrator. Subsequent observations tracked the activities of the financial administrator until files were transferred to the coder. Analysis of observation data was performed using the value stream map tool, followed by intervention through the implementation of SEP electronic systems and an outpatient auto closing system. After one month, the value stream map was reassessed to evaluate the impact of the interventions.

RESULTS AND DISCUSSION

Current State

Five stages of the process were identified through observations of financial administration activities in the outpatient department. It commences with the manual SEP handover process with polyclinic nurses, which has a 30-minute cycle time and is categorized as a non-value-added activity. The subsequent step involves checking manual SEP data against patient visit data in the hospital management system, taking 15 minutes, and handling lost files, which necessitated reprinting,

constituting another non-value-added activity with unnecessary processing.

Following this, data sharing on visits to three administrators and the identification of incomplete transactions took 5 minutes per file, while manually closing transactions in the system required 2 minutes for each file. Lastly, the process of handing over patient data and SEP manual files to the coder consumed 30 minutes, also classified as a non-value-added activity. The total value-added activities amounted to 22 minutes, while non-value-added activities accounted for 60 minutes, resulting in a total lead time of 82 minutes. The value-to-waste ratio in the current state stood at 36%, as illustrated in Figure 1.

Referring to Lean theory, a company is considered sufficiently lean if the value to waste ratio reaches a minimum of 30%. In 2006, Japan's value to waste ratio had already reached 50%, with Toyota Motor, as a pioneer of Lean management, achieving 57% (Husna, M., 2017). In a study conducted in the outpatient unit of Sumber Waras Ciwaringin Hospital, the value to waste ratio remained at 10%. The Lean method managed to improve the value to waste ratio to 48% (Tjahyanto, A., 2015).

Previous studies on lean management in outpatient services have not highlighted the administrative process after patient care is completed. Elisabeth Dyah Noviani's study titled "Application of Lean Management in Outpatient Services for BPJS Patients at Hermina Hospital Depok in 2017" stated that 90% of the service time consists of non-value-added activities, with only 10% being value-added activities. After conducting future state analysis with proposed improvements using lean methodology in a simulated manner, including 5S, Kanban Inventory, and visual management, the non-value-added activities decreased to 78.30%, while the value-added activities increased to 21.70%. Compared to the findings of this research, the Value to Waste ratio was slightly better but not significantly different, at 36%, which represents value added. This could occur due to differences in the research focus area chosen and because Pasar Minggu Public Hospital has implemented an integrated hospital management information system that extends to the billing department.

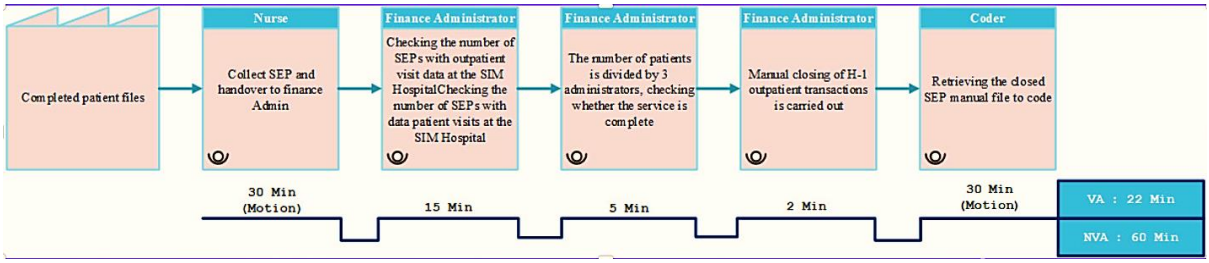

Figure 1. Current Value Stream Map of the Outpatient Transaction – Taking 22 until 60 minutes Process in Total

Re-evaluate after Intervention

The intervention involved implementing the SEP electronic system and the auto-closing billing system, which were tested over a one-month trial period. With the integration of these electronic systems, the process underwent significant streamlining: Firstly, the financial administrator retrieves patient visit data from the previous day, a task completed within 5 minutes. Next, the administrator spends 5 minutes identifying pending transactions not yet auto closed by the system and addresses any underlying issues. Lastly, the closed transactions are promptly distributed to outpatient coders for the coding process, requiring an additional 5 minutes. For an overview of the value stream map, refer to Figure 2.

Overall, this process boasts a total lead time of 15 minutes, with all steps classified as value-added activities. Consequently, the value-to-waste ratio reaches 100%. Activities lacking added value can thus be eliminated. In fact, this intervention already solves the potential of missing SEP File because it changed them into electronic version of SEP; and create a transaction auto closing system which shortened long duration in the financial administration part. For clearer procedure of auto closing process system, see Figure 3.

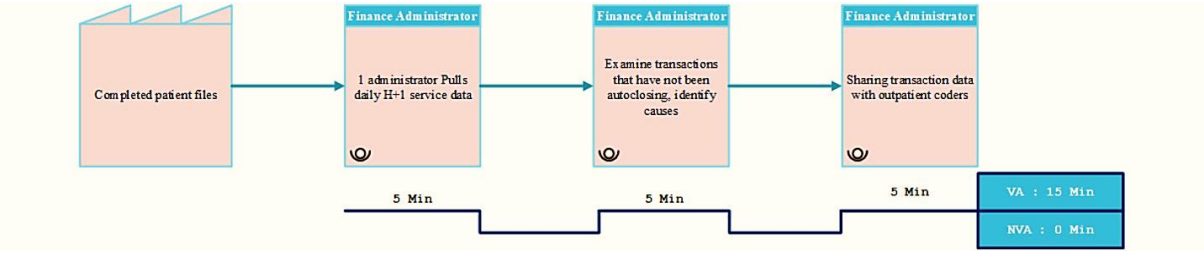

Figure 2. Future Value Stream Map of the Outpatient Transaction – Taking average 15 minutes Process in Total

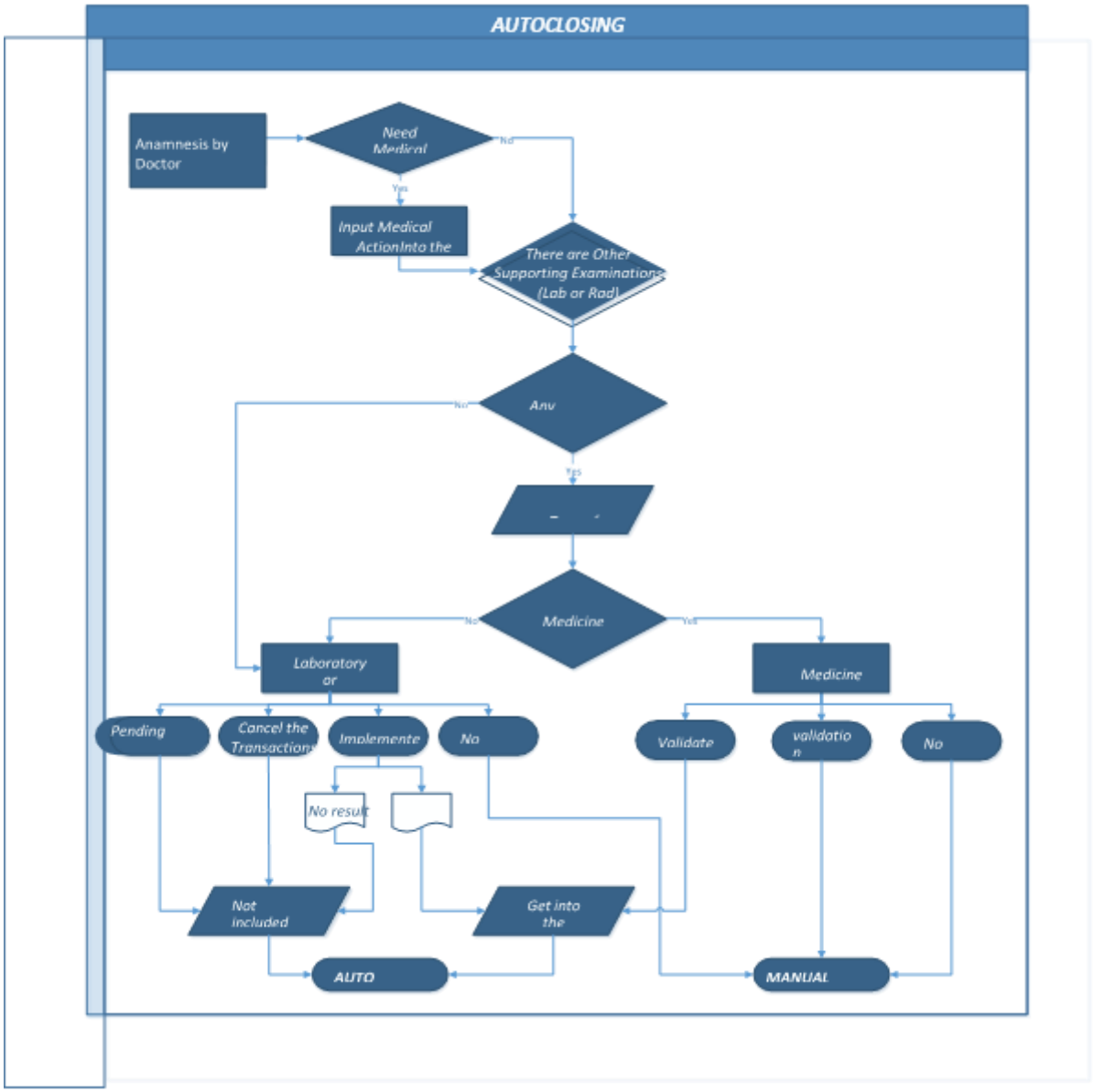

Figure 3. Auto Closing Flowchart

Short Term Improvements

Short-term improvements, achievable within six months, include the following actions:

1. Streamlining the transfer of manual SEP files from nurses by introducing electronic registration and integrating SEP with the hospital database.
2. Simplifying the cancellation process for patients who do not seek treatment by enabling direct cancellation on the day of registration.
3. Enhancing financial administration efficiency by implementing a pull system method through an auto-closing system or automating the

closure of patient billing transactions upon completion of supporting examinations. Refer to Figure 2 for the auto closing system flow.
4. Establishing a new Standardized Procedure (SPO) aligned with the updated workflow and standardized practices.

Long Term Improvements

For long-term improvements, which extend beyond six months, the following actions are proposed:

1. Implementation of KAIZEN (continuous improvement) activities for the billing system, to be conducted regularly, at least every six months, ensuring ongoing refinement and optimization.
2. Development of an auto-cancellation system for incomplete investigations within a time frame of 7 days, aiming to expedite processes and reduce delays.
3. Advancement of lean management principles through the digitization of the entire third-party billing process, enhancing efficiency and reducing reliance on manual processes.

Analysis of the current state reveals a significant prevalence of non-value-added activities, reaching 73.17%. This is primarily attributed to the manual handling of files and human-dependent identification processes. According to Gaspersz (2011), a lean enterprise should achieve a minimum value-to-waste ratio of 30%. With non-value-added activities comprising 73.17% of the process, it indicates that the administrative process for JKN patients at Pasar Minggu Hospital falls short of lean enterprise standards. Therefore, efforts are essential to enhance service efficiency through the application of lean thinking principles.

CONCLUSION

In the current state value stream mapping it was known that most of the time was used for non-value added (waste) activities at 73.17%, while value-added activities were only 26.82% of the total processing time, indicating that the outpatient billing process at Pasar Minggu Hospital still included in the un-lean enterprise. An improvement effort is needed to streamline the process and make human resources efficient.

Interventions carried out within the framework of kaizen (continuous improvement) were in the form of the electronic use of SEP and the use of outpatient transaction auto closing systems. The results of the intervention carried out in the context of continuous improvement show that the use of electronic SEP and the applied auto closing system could reduce the number of process stages, time, and human resources in financial administration. Waste in the current state, found 4 (four) types of waste, namely motion, extra processing, unutilized talents transportation. In the re-evaluation, it was found that the value stream map had shown an increase in value-added activities by 73.18% to 100% and waste could be eliminated. Human resources can be streamlined by 2 people because only 1 person is needed in the process of closing outpatient billing.

Some limitations of the study that may need to be addressed include: Limitations in the scope of the research, such as focusing on a single hospital or a specific unit within the hospital, may affect the generalization of the findings to other healthcare settings. Constraints in observation or data collection time frames, which may not capture all variations or changes in the billing process over a certain period. Methodological limitations, such as a focus on quantitative approaches without considering qualitative perspectives or vice versa, may limit a comprehensive understanding of the billing process's complexity. Resource constraints, including technical limitations in implementing new systems or limitations in the number of staff available for research purposes.

RECOMMENDATION

For Hospital, conduct periodic evaluations within the Kaizen framework every 6 months to ensure ongoing improvement. For researchers, continue the research through quantitative analysis to measure the effectiveness of interventions. Persist in implementing digitization in subsequent billing processes to enhance efficiency further.

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APPENDIX

Table 1. Lean Analysis on Financial Administration Activities up to Handover with Koder Instrument

No.	Activities	Value	+/-	*Non-Value*	
				Jeni	**Information**
	SEP File Handover Process				
1	The nurse collects the SEP file from the patient	-	+	*motion*	Nurses need time to recapitulate manual SEP files at the Polyclinic.
2	The nurse checks on the doctor's visit data	-	+	*Non-utilized talent*	Nurses need additional time to match manual SEP counts with patient visitsthat day. It should not be the nurse's responsibility.
3	The nurse gives the SEP manual to the financialadministration after the service is finished		+	*motion*	The nurse of each polyclinic handed over the SEP pile to the financial administration. Internal medicine and medical rehabilitation are always the lastto be submitted because of the large number of patients.
4	The financial administration receives manual SEPfiles and signs the handover book	-	+	*xtra Processing*	Sometimes it takes a long time to wait for some polyclinics.
	The Process of Checking The SIM RS				
1	Enter the financial administration application,select the polyclinic, display daily visit data	+	-		
2	Identify missing SEPs		+	*extra processing*	Considered waste because it takes HR time.
3	SEP reprint	-	+	*extra processing*	Inefficient use of paper.
	Transaction Checking Process				
1	In the financial administration application, click onthe patient's medical record, whether all processes have been checked or not. Follow up transactions that are still hanging	+	-		
	Manual Closing				
1	Perform closing billing on the cashier application system	-	+	*Non-utilized talent*	It takes the most time because the number of transactions that must be closedis tens of thousands every day.
	Handover Process To Coder				
1	The financial administrator collects the closedSEPs		+	*motion*	Wasting administrator time.
2	Hand over the SEP file to the coder	-	+	*motion*	The coder had to go down to the polyclinic floor to retrieve the SEP file from the financial administrator.

Table 2. Waste Elimination Measures Instrument

No	Office	Elimination Waste	Action
1	Nurse at Polyclinic	*motion*	Eliminate processes involving nurses
2	Financial administrator	*extra processing*	Digitizing the manual closing system with the autoclosing system
3	Financial administrator	*motion*	Distribution to coders also through the system
4	Financial administrator	*Not utilized talent*	There is no need to close for a complete transaction. It only needs to identify incomplete transactions