Original article
DOI:10.17323/1999-5431-2025-0-5-159-184

AN EFFICIENCY MODEL IN PUBLIC PROCUREMENT: IMPLEMENTATION OF LEAN SERVICE FOR PRODUCTIVITY

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Abstract. Public organisations exhibit inefficiencies in their procurement activities. These inefficiencies are the result of extended management times negatively impacting the fulfillment of established objectives. This in turn fosters social discontent, creates inadequate work environments, and creates distrust toward the organisation.

This research proposes a model to eliminate and improve those procurement activities and processes that cause bottlenecks, that consume excessive time, and which fail to deliver value for the organisation. The objective is to strive for efficient procurement. The findings indicate that the greatest time expenditure occurs during the preparation of the "Terms of Reference" (TOR) or the "Technical Specifications" (TS). To enhance the preparation of TORs and TSs, the 5S Digital Methodology is proposed for the standardisation of documentation, and the streamlining of the procurement of goods, services, and works.

A thorough review of all the activities in the phase often referred to as "Preliminary" (that is prior to the placement of the Procurement Contract) was conducted to eliminate all activities that do not add value, and/or contribute to bottlenecks and/or are counterproductive to optimisation of the time for delivery.

The objective is to enhance response times in procurement, resulting in more efficient and less redundant processes. Quantitative assessment of the potential for improve-

ment was made using the establishment of standard times to measure workflow, then comparing them against the outcomes of previously contracted processes. The analysis revealed that over 50% of these processes consumed 300% of the standard time, highlighting a deficit that was not mapped in the organisation's expenditures.

Keywords: Lean Service, VSM, contracting, public sector, 5S.

For citation: Colca-Hidalgo, W.E., Quispe-Santivañez, G.W., Arevalo-Avecillas, D.X. and Luciano-Alipio, R.A. (2025) 'Efficiency model in public procurement: Implementation of lean service for productivity', *Public Administration Issues*, 5, pp. 159–184. (In English). DOI:10.17323/1999-5431-2025-0-5-159-184

JEL Classification: H54, O31, L32.

Introduction

States require a diverse range of resources to fulfil their functions, and they use public procurement as a key mechanism for acquiring them (Xanthopoulou and Plimakis, 2021; Lapuente and Van de Walle, 2020). In Peru, the legal framework governing the acquisition of goods, services, and works in the public sector is enshrined in the Government's 2015 Public Procurement Law (N° 30225) and its associated Regulations (D.S. N° 344-2018-EF). Peru's State Supervisory Body for State Contracts (OSCE) has to ensures that procurement processes are efficient, competitive, and transparent. Overall, this framework regulates phases, timelines, and parameters to control quality in procurement (Bosio et al., 2020; Omar et al., 2021; Luciano et al., 2022).

Within the "Preliminary Phase" identified above, there is a process where potential contractors or suppliers are identified. This is the "Selection Process". The Peruvian regulatory framework has prioritized the reduction of deadlines in the "Selection Process" phase, adapting to international trends in selection processes as proposed by Leaver et al. (2021). However, there is another stage in the Preliminary Phase that is largely unregulated or controlled. This is the "Preparatory Acts" phase, which is managed solely by the entity undertaking the procurement. This phase is characterised by the initial identification of the need, and after passing through a number of steps, ends with the approval of the procurement contract terms and the call for bids. This phase has no established minimum or maximum deadlines. Thus, there is considerable variability in the duration of these processes.

In procurement procedures for goods, services, or works, the purchasing entity must formulate its need through a "Terms of Reference" (TOR) or "Technical Specifications" (TS) in accordance with Article 29 of the Public Procurement Law (Government of Peru, 2015). The purchasing entity is responsible for ensuring the technical quality of the requirement for this documentation. The objective is to avoid time-wasting reformulations – the correction of errors in the documentation which was made carelessly or in haste, or sometimes adding or omitting items to or from the contents.

Once drafted, the request is approved by an approving committee and sent to the responsible Governmental Administration and Finance Department for validation and subsequent forwarding to the Logistics Department.

Upon receiving the procurement documentation, the Logistics Department reviews it for compliance with all relevant regulations, ensuring that there are no ambiguities, unnecessary requirements, or barriers that could hinder the delivery. If the documentation does not align with the Procurement Law, Logistics may reject it, causing delays, missed deadlines, loss of work hours, rework, and a negative workplace environment. Regenerating and correcting requirements may take 15 to 20 business days, extending the overall process to up to 50 days.

A report from the Office of the Comptroller General (2023) identified deficiencies in public sector selection procedures, revealing that 55.4% of problems stem from the Preparatory Acts, particularly in the drafting of requirements. These shortcomings not only cause significant delays but also facilitate improper direction of contracts, which is often linked to corruption. As a result, governmental efficiency is compromised, affecting the quality and timely delivery of public services, with a negative impact on citizens. Specifically in the area of procurement of the Public Prosecutor's Office in Peru, critical problems were identified related to delays in calls for tenders due to the lack of timely submission of the need's requirements.

Galloway (2002) describes processes as tasks or steps with inputs and outputs aimed at creating tangible or intangible products. Inputs may include materials, equipment, information, and resources, which, when transformed, produce results that meet customer needs. Later, Krajewski, Malhotra, and Ritzman (2008) defined a procedure as a set of activities that transform inputs into products to satisfy needs. Figure 1 illustrates the key activities of the Preparatory Acts process in public procurement in Peru, such as needs identification, development of "Terms of Reference", internal reviews, and approvals, all essential for ensuring process efficiency and transparency.

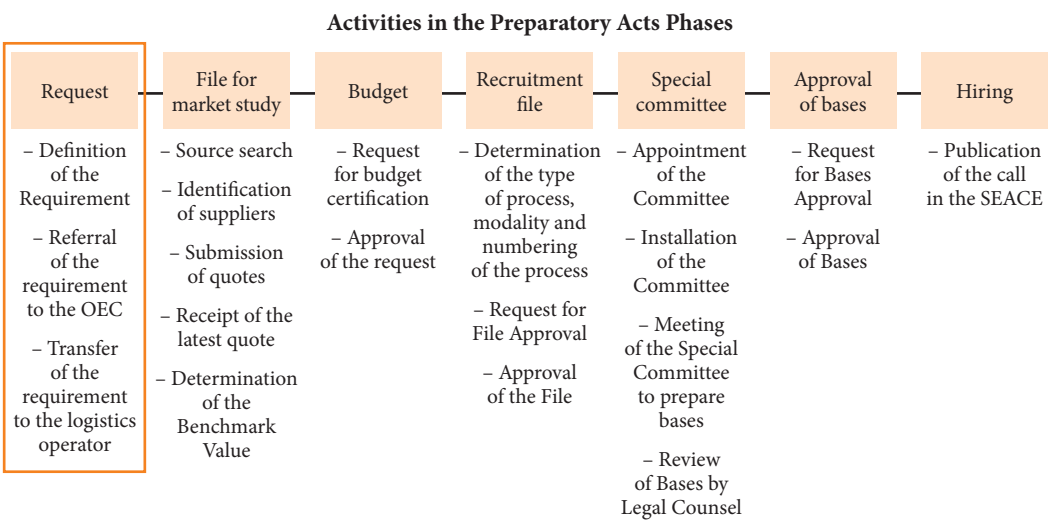

Figure 1. **Activities in the preparatory act's phases**

Note: – SEACE is the Peruvian SEACE (Electronic System for State Procurement) web portal.

Ishikawa diagrams (sometimes called "fishbone diagrams" are causal diagrams that show the potential causes of a specific event. This type of diagram was used to identify the probable causes of delays in procurement management. This diagram was developed from information on contracting and acquisition processes in the Public Prosecutor's Office in Peru, but the picture is very similar in other organisations in the Peruvian public sector. This tool allows the variables that contribute to contracting delays to be visualized by categorizing factors related to people, processes, materials and policies, facilitating a comprehensive analysis to identify areas for improvement and implement strategies to optimize public procurement management (see fig. 2).

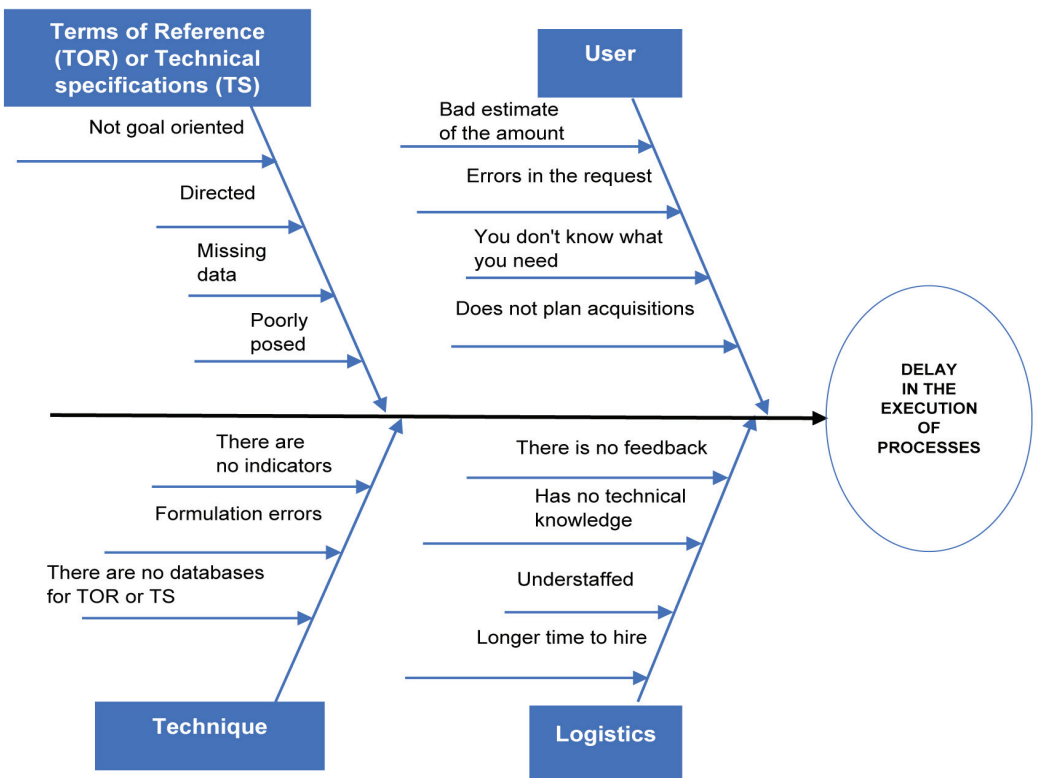

Figure 2. **Ishikawa diagram**

The information gathered revealed several variables that highlight challenges in procurement management. Using diagrams will help adjust processes and implement actions to improve these variables. This approach aims to eliminate waste, optimise resource use, and address negative factors, promoting efficient, sustainable management practices aligned with institutional objectives and enhancing overall procurement performance (see fig. 3).

To achieve efficient procurement that maximises the value of public resources, it is essential to ensure that contracts are executed timely, under optimal conditions, and with only positive impacts on the relevant social environment.

This initial analysis aims to examine the first phase, termed "Preparatory Acts", which is considered the first link in public procurement management (Aga-

ma et al., 2021). Their study focuses on the "Requirement" process, which is the starting point for effective procurement. In this phase, the need for contracting is defined, ensuring effective contractor selection and execution that aligns with user area demands, thus avoiding setbacks. Subsequent processes will be analysed up to the call for bids to identify bottlenecks, non-value-adding activities, and time-consuming tasks. Ultimately, the goal is to establish an efficient, streamlined process and develop standard Terms of Reference (TOR) or Technical Specifications (TS) that minimise reformulation, allowing staff to generate additional value for the organisation during their free time.

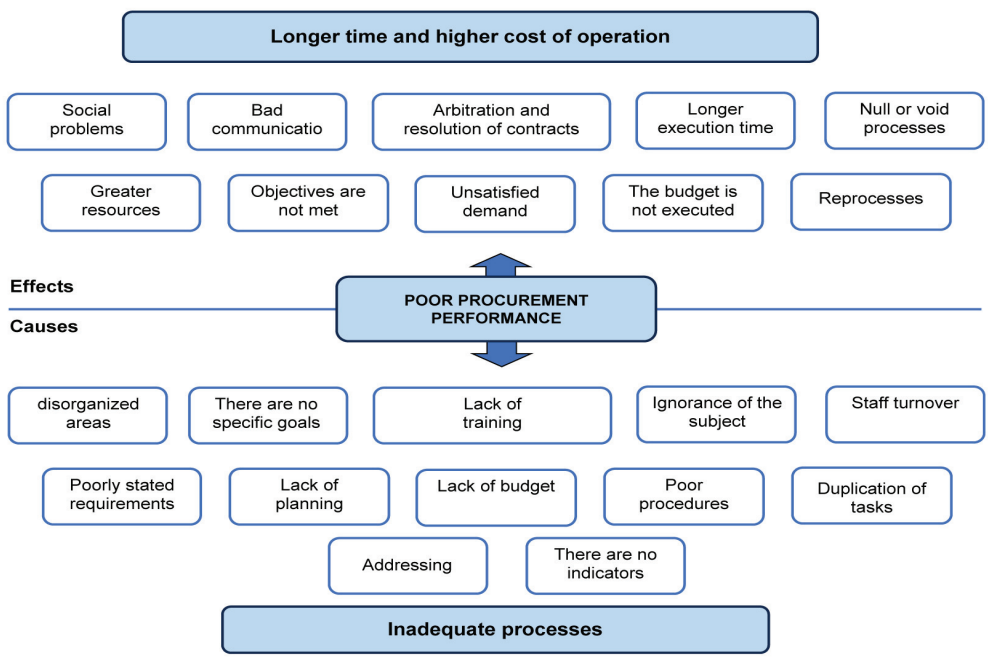

Figure 3. **Cause – effect diagram**

Theoretical review

The purpose of this research was to demonstrate that through continuous improvement organisations can achieve significant changes in the production or service system, as well as the generation of value, that are reflected in the perception of the final customer (Costa et al., 2019). The main problem in the case study lies in the excessive use of time to prepare and define the procurement entity's needs. When this is added to the times for the following contracting management stages, the overall result is that the procurement is executed outside the established deadlines. The overall result is low or deficient compliance to the budget, internal and external problems in the organisation, perception of inefficiency by the society where it operates and dissatisfaction of the stakeholders (Torfing et al., 2019). Once this problem was determined, information was sought through scientific articles in order to have an overview of possible solutions. The information collected was grouped by tools in order to have a clear vision of what methodology can be applied to solve the problem.

Three tools were reviewed. The first was Lean Office, whose main objective is to eliminate repetitive activities or tasks or those that do not add value to the organisation, being unnecessary in the processes (Magalhães et al., 2019). The second tool was Lean Service, which focuses its study on the organisation's process map to identify key activities and eliminate those activities that do not generate value (Ginting et al., 2020). The advantage of this methodology lies in the reduction of times, optimising the quality and efficiency of the same with a view to customer satisfaction. The third tool analysed was Value Stream Mapping or VSM. The objective of this methodology is to visualise the processes graphically, which allows for improving the flow of processes by determining whether or not they add value to the organisation (Jebur et al., 2021; Latha et al., 2021). Finally, within these mentioned tools is the Yamasumi Diagram, a tool that allows to graphically see the production times, as well as the stop times that affect the process (Martinelli et al., 2022).

These tools all have the common objective of identifying and eliminating activities that do not generate value for the organisation, improving times in each of the processes and eliminating bottlenecks (Martinho et al., 2022). Once the study of the articles has been completed, it is possible to see that the different methodologies studied can be adapted to the object or need of the organisation, be it production, services or mixed (Camargo-Henríquez and Silva, 2023).

In this context, one of the possible solutions for our problem of generating the Terms of Reference or Technical Specifications is to apply the digital 5S methodology to perfect a template that can be reused and stored for a future contract. According to different definitions, the 5S methodology is a tool that seeks to standardise routine activities with the aim of reducing the use of time (Manzano and Gisbert, 2016). It is also used to configure and maintain the quality of the work environment in an organisation (Ghodrati and Zulkifli, 2012). 5S is the methodology for creating and maintaining a well-organised, clean, high-efficiency and high-quality workplace (Shaikh, 2015). In our case it will be applied to the virtual environment where there will be a reusable TOR or TS repository for every need so that the user only reads and adds text from lessons learned in the past contract, once approved it will once again be part of the repository for a new contract.

On the other hand, process management is a way of planning, organising and directing the processes or activities that are executed in any organisation. It depends upon an understanding that a process comes to make a set of tasks, procedures, rules, among others, necessary for the organisation to make use of the resources it has, in order to deliver the good or service. In this context, to improve process times in the phase of preparatory acts of contracting, we rely on the Value Stream Mapping (VSM) methodology (notably including the TPS (Toyota Production System) tool (Womack et al., 1990) to graphically identify the bottlenecks and activities that do not provide value (waste).

Materials and methods

In contemporary organisations, productivity is primarily defined by the presence of efficient, controlled procedures, complemented by well-established indicators and defined timelines for each activity to effectively address various needs.

Effective time management is crucial, enabling organisations to achieve more with reduced effort. Therefore, the proposed methodology aims to identify, eliminate, and improve activities and processes that generate bottlenecks, consume excessive time, or lack value for the organisation.

Within this framework, the analysis specifically concentrated on one of the three phases of Public Procurement, namely the Preparatory Acts. This initial phase is characterised by limited regulation and places the onus on the procuring entity to design efficient procedures that facilitate timely contracting from the identification of a need to the formal call on the SEACE (Electronic System for State Procurement) web portal.

The analysis commenced by detailing the primary activities and sub-activities that constitute this initial phase. By systematically addressing these components, the methodology aims to enhance overall efficiency, streamline procurement processes, and ultimately foster a more responsive and accountable public procurement system (see Table 1).

Table 1

Activities of the First Study Phase

NEED	– Incorporate the need in the annual need record. – Prepare TS or Terms of Reference. – Review TS or Terms of Reference. – Approve TS or Terms of Reference. – Generate requirement
APPLICATION	– Reception in Administration. – Reception in Logistics. – Derivation to the purchase operator. – Review of TS or Terms of Reference
DETERMINE THE VALUE OF THE PROCUREMENT	– Request for quotation. – Receipt of quotes. – Compare prices. – Coordination with the user area. – Establishes value of the contract. – Approves the value of the contract
BUDGET AVAILABILITY	– Request for budget availability. – Certification of availability
APPROVAL OF THE PROCUREMENT FILE	– Request for file approval. – Approval of contract file
APPOINTMENT OF SELECTION COMMITTEE	– Conformation. – Notification. – Facility
APPROVAL OF THE BASES	– Preparation of bases. – Request to approve the draft bases. – Approval of bases
MAKE THE CALL	– Registration in the State electronic procurement web portal, SEACE

Source: Created by the author (- hereafter, unless otherwise indicated).

For a better study, two classification groups were formed. The first corresponds to the group called "Generation of Need" as identified from the requirements in the view of the Procurement Entity and the second group called "Market Study" that falls to the Logistics Department. As a result, the process activities of each group are mapped as follows (see fig. 4; 5).

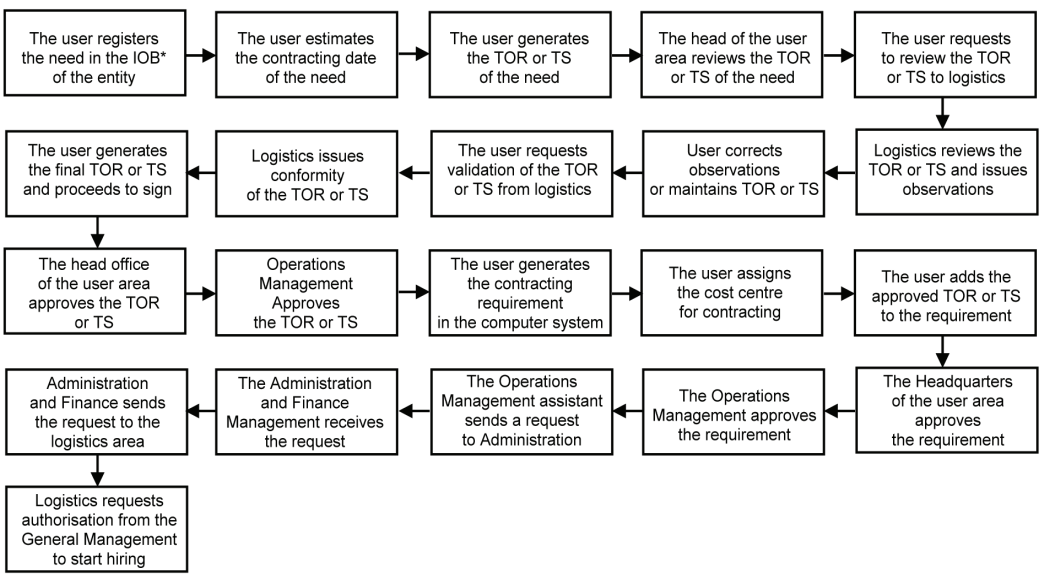

Figure 4. **Need generation activities**

Notes: *IOB – initial opening budget.

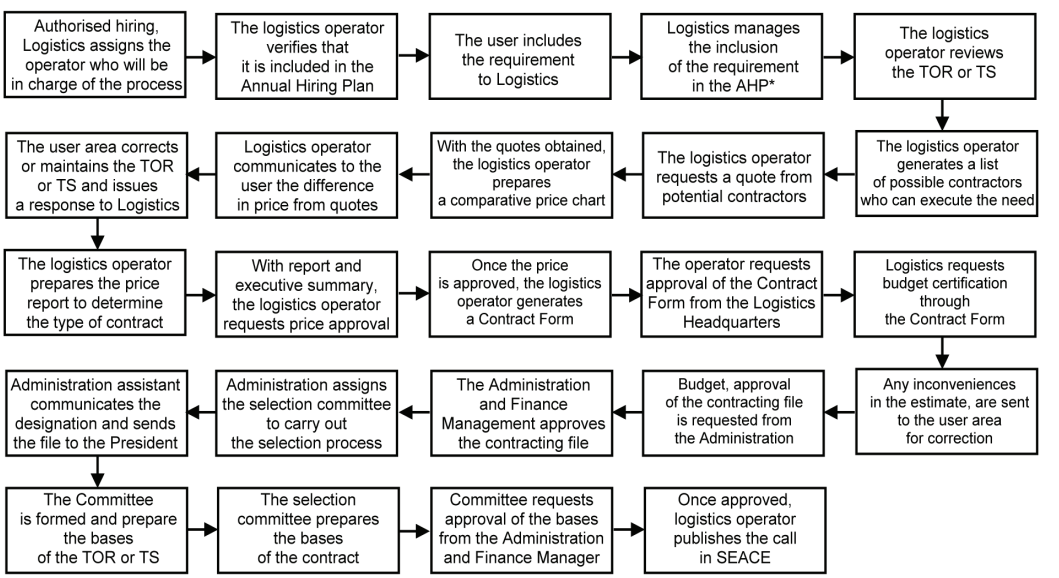

Figure 5. **Activities for Preparatory Acts**

Notes: *AHP – annual hiring plan; SEACE: Electronic System of State Procurement.

From the analysis of the activities, it became apparent that the processes in the first group accounted for an increase (as much as a doubling or tripling) of the optimum programme time for the Procuring Entity's activities. The observed delays generally occur due to one or more of four main factors. These are a lack of knowledge of the subject when preparing the "need" (the statement of characteristics and/or specifications of the thing being procured), ignorance of the procedures (lack of knowledge of the objectives or the planning of the needs), lack of budget (errors in assigning accounts, projects, sources of financing) and personnel issues (such as constant turnover of personnel in the operational area). In the same way, delays in the second group were found to originate from one or more of three main factors. These are delays in requesting quotes, the logistics operator's own management procedures in carrying out and requesting approval in each of the activities; finally, the time for the preparation of specific regulatory documents (standard bases) of the contracting process to be carried out, by the selection committee.

The "Request Quotation" activity depends on external users (responses from suppliers) and we assume that the efficiency in this activity depends on the TOR or TS. That is the less redundancy and the clearer the description of the need, the better the market response will be. It would not need user ratification to establish the budget of the good, service or work that is intended to be contracted. On the other hand, the activity "Elaborate Bases" also depends on a third party within the organisation, the elaboration falls on the committee whose responsibility and performance are in addition to the functions for which it was hired in the Entity.

It is clear that all the activities and processes needed to "Generate the Need" and continue up to the contracting phase (the "Preparatory Acts") affect the scope and goals set by the organisation if the thing being procured is to be delivered within the required parameters of programme, budget, and specification. Of the activities with the highest variability in time for completion in the first group we have the "preparation of the TOR or TS" that involves their generation, review, and correction concluding with their approval. In the second group, the items with the highest degree of variability in the completion time found were "request a quote", "prepare bases" and "budget certification". From the data reviewed, we found that the time to finalise budget certification (approval for the procurement) can be significantly delayed if the market response is significantly more than the original user budget estimate. Two main reasons why this could happen are the user failing to use internal cost data correctly when preparing preliminary proposals for budgetary allocation, and secondly, from a poor preparation of the initial TOR of TS. If either or both these factors have been at work, and a non-compliant market response is obtained, then the TOR/TS has to be amended. Arguably whilst this process adds "value" (because without it there could be no procurement – and thus falls within the parameters of a Lean requirement), it actually wastes time and resources. However, the real "value" must come from the correct implementation of the steps to prepare "proper" TOR/TS and a strict Lean analysis to ensure no wastage appears in the correct preparation of original budget coupled to real need. A further factor was identified causing delay in the budget certification. Incorrect initial allocation of a project or cost centre which expenses should be charged to means all the progress has to be rolled back to the initial

stage to generate a new requirement of need. Similarly, if the cost centres have no funds, then again, the whole process must start again.

Table 2

Hiring history Year 2021

Process	SCHEDULED MONTH	TOR LOGISTICS REVIEW	RECEIVES FINAL TOR LOGISTICS	CALL DATE	PHASE 1 (DAYS)	PHASE 2 (DAYS)	TOTAL BUSINESS DAYS
1	April	13/03	12/04	12/05	21	23	44
2	June	11/05	14/05	28/06	4	32	36
3	June	19/05	24/05	06/07	4	32	36
4	August	20/07	27/08	24/09	29	21	50
5	August	26/08	02/09	21/09	6	14	20
6	August	08/07	21/07	14/09	10	40	50
7	August	23/09/	28/09	21/10	4	18	22
8	October	04/10	26/10	01/12	17	27	44
9	October	28/09	28/10	24/11	23	20	43
10	November	15/10	26/10	18/11	8	18	26

Table 3

Standardized time for activities

Cluster	Description	Maximum Time (days)
A	Preparation and Delivery of TOR or TS	5
B	Referral of Conformity or Observations to TOR or TS	3
	Remission of Requirement and TOR or TS	
	Remission of Conformity or Observations upon Request	
C	Remission of Requirement and definitive TOR or TS	3
D	Reception of Authorisation Requirement by GM*	1
E	Market study	10
F	Technical Validation of Quotations	2
G	Approval of Authorisation Form	1
H	Budget Certification	1
I	Approval of the Procurement File and Delivery to the designated Committee	1
J	Base Formulation	5
K	Approval of Bases	1
	TOTAL	***33***

Notes: GM* – general management.

As a consequence of these delays, it is necessary to have information that determines the times in each activity. Since the organisation does not have indicators that can measure each of the steps described in Figure 4 and 5, we collected information from the last contracts made in one year to count a baseconstruct a database of the time spent in each of them, obtaining the following result (see tab. 2).

In order to measure each of the activities and carry out a better analysis, in coordination with the user areas, planning and logistics, standardised deadlines were established for each activity that will be used to measure each process from now on. For a new proposal for procurement, the following "ideal" standard was established (see tab. 3).

Solution approach

According to the problem evaluated, one of the most time-consuming activities occurs during the preparation of the Terms of Reference (TOR) or Technical Specifications (TS). To enhance this activity, the implementation of the digital 5S methodology was suggested (see fig. 6), with the aim of establishing standard documents that expedite the procurement of goods, services, and works.

This methodology proposes designing standard templates for TOR or TS, enabling users to focus primarily on developing and refining the technical context of the desired procurement. Additionally, it is recommended to establish standardised evaluation criteria for each type of process to mitigate issues related to directionality or barriers in the selection process.

Furthermore, the creation of a repository to store approved TOR or TS documents is essential. This repository will serve as a foundational resource for future procurements, whether similar or identical, thereby improving response times when addressing new needs and eliminating the necessity for users to create documents from the very beginning. With standard documents in place, the need for multiple revisions and approvals will be significantly reduced, streamlining the procurement management process and enhancing overall efficiency.

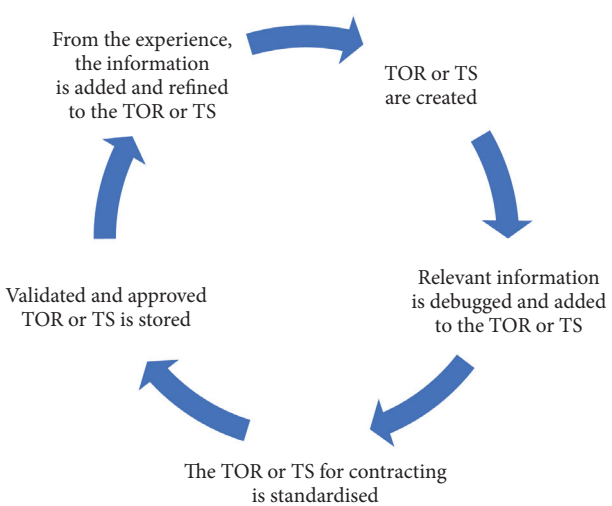

Figure 6. **5S Diagram – Standardization of TOR or TS**

On the other hand, it is thought that merely standardising the Terms of Reference (TOR) or Technical Specifications (TS) will not suffice to enhance procurement management. Therefore, a thorough review of each activity within this phase was conducted to identify and eliminate those that do not contribute value to the process, and remove bottlenecks, and standardise timelines. These solutions are anticipated to improve response times in the organisation's procurement activities by fostering more efficient and less redundant processes. Furthermore, this approach aims to minimise the knowledge gap for new team members, thereby facilitating their onboarding and integration into the procurement framework (see fig. 7).

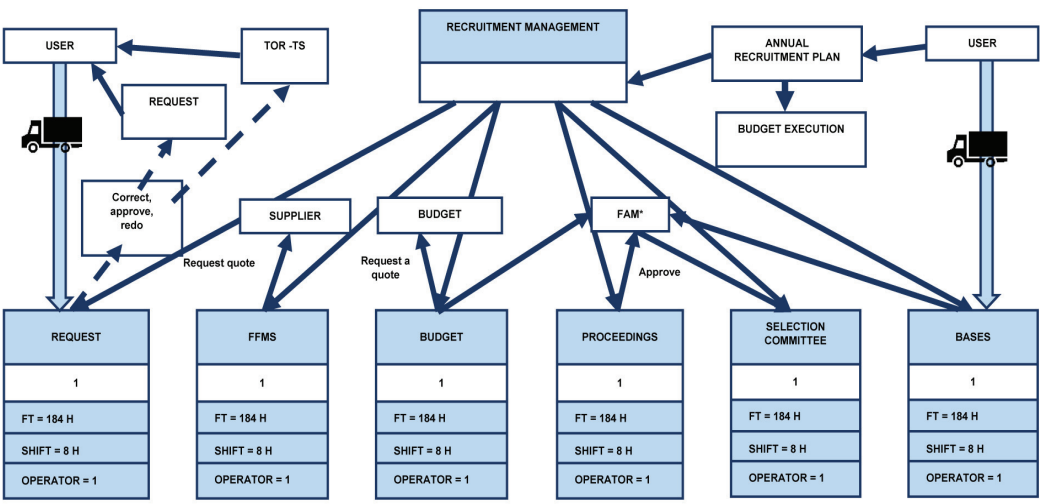

Figure 7. **Current value stream mapping (VSM)**

Notes: *FAM – financial administration management; FFMS: FILE for market study; FT: full time; SHIFT: working hours; OPERATOR: Worker.

To support the proposed improvements, comprehensive training for all stakeholders involved in contracting, management, and needs planning is essential. This training aims to enhance procurement efficiency from the initial user to the final operator in the supply chain. Once implemented, solutions must be managed and controlled through continuous improvement and performance monitoring. This approach will facilitate assessing the effectiveness of the proposed solutions, allowing for iterative enhancements. Ultimately, the goal is to achieve greater procurement efficiency while minimising both time and resource expenditure.

Results and discussion

To achieve organisational efficiency, activities must be executed using minimal resources, effectively optimising time and eliminating rework or reformulation. Consequently, based on the data collected, the first proposed improvement is to conduct activities only once, thereby avoiding redundancies. Following this, a thorough evaluation of each activity will be undertaken to identify redundant tasks that do not add value to the process. As an initial step, time waste

was identified within each of the analysed groups using the Yamazumi diagram. Figures 8 and 9 illustrate, through colour coding, the activities that create value, those that are necessary, and those deemed unnecessary (waste).

Figure 8. **Generating need for essential and non-essential activities**

Note: OIB: Initial opening budget.

Subsequently, based on the information gathered and the established standard times, a comparison was made between the times utilised in the processes that had already been executed (see Table 4). This analysis revealed that, in Phase 1, 50% of the processes were completed within the designated timeframe, while the remaining 50% significantly exceeded the schedule. A survey conducted among the logistics team aimed to ascertain the reasons behind the disparities in execution times. Respondents indicated that the efficiency of processes was largely influenced by the speed at which the user area modified the Terms of Reference

(TOR) or Technical Specifications (TS) following the initial review. In contrast, the processes that experienced delays were attributed to various factors, including substantial changes that necessitated a complete revision of the TOR or TS, a lack of detail in the fieldwork, or the prioritisation of other needs, which resulted in the documents being inadvertently neglected.

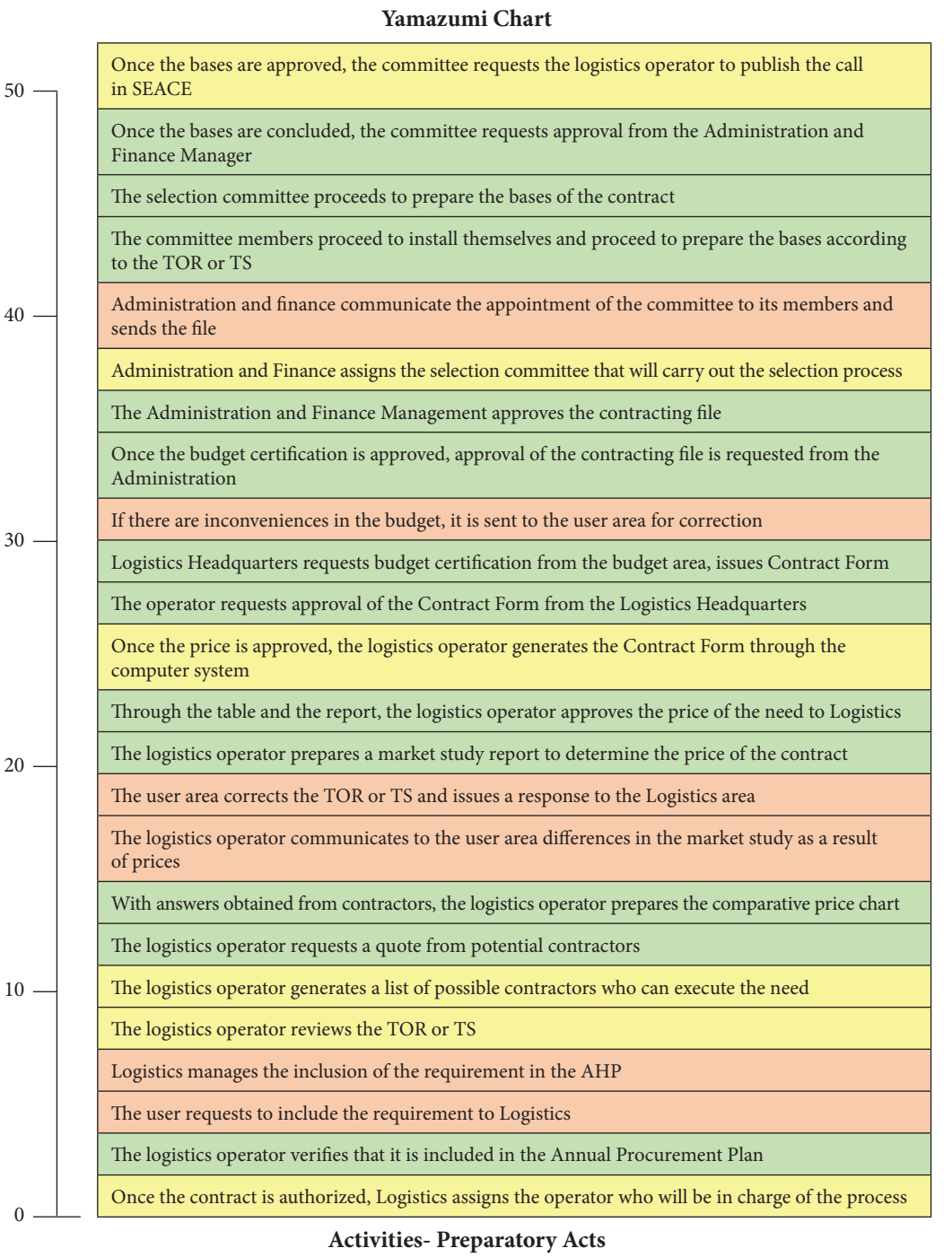

Figure 9. **Preparatory acts for essential and non-essential activities**

Table 4

Current management time in Generating Need

	Description	Time	TOR LOGISTICS REVIEW	PHASE 1 (DAYS)	RECEIVE FINAL TOR LOGISTICS
		days	13/03/2021	21	12/04/2021
A	Preparation and delivery of TOR or TS	5	11/05/2021	**4**	14/05/2021
B	Referral of conformity or observation to TOR or TS	3	19/05/2021	**4**	25/05/2021
	Remission of requirement and TOR or TS		20/07/2021	29	27/08/2021
	Referral of conformity or observation to request		26/08/2021	**6**	02/09/2021
C	Remission of requirement and final TOR or TS	3	08/07/2021	10	21/07/2021
D	Reception of authorisation request by GM	1	23/09/2021	**4**	28/09/2021
E	Market study	10	04/10/2021	17	26/10/2021
F	Technical Validation of Quotations	2	28/09/2021	23	28/10/2021
G	Approval of Authorisation Form	1	15/10/2021	**8**	26/10/2021
H	Budget Certification	1			
I	Approval of the Procurement File and delivery to the designated Committee	1			
J	Formulation of bases	5			
K	Approval of Bases	1			
		33			

Table 5

Current management time in Preparatory Acts

	Description	Time	TOR LOGISTICS REVIEW	PHASE 1 (DAYS)	RECEIVE FINAL TOR LOGISTICS
		days	12/04/2021	23	12/05/2021
A	Preparation and delivery of TOR or TS	5	14/05/2021	32	28/06/2021
B	Referral of conformity or observation to TOR or TS	3	24/05/2021	32	06/07/2021
	Remission of requirement and TOR or TS		27/08/2021	**21**	24/09/2021
	Referral of conformity or observation to request		02/09/2021	**14**	21/09/2021
C	Remission of requirement and final TOR or TS	3	21/07/2021	40	14/09/2021
D	Reception of authorisation request by GM	1	28/09/2021	**18**	21/10/2021
E	Market study	10	26/10/2021	27	01/12/2021
F	Technical Validation of Quotations	2	28/10/2021	**20**	24/11/2021
G	Approval of Authorisation Form	1	26/10/2021	**18**	18/11/2021
H	Budget certification	1			
I	Approval of the Procurement File and delivery to the designated Committee	1			
J	Base formulation	5			
K	Approval of Bases	1			
		33			

Similarly, a comparison of the execution times in the second phase (see tab. 5) against the established standard times revealed that 40% of the executed processes occurred outside the designated time parameters. The survey responses highlighted multiple reasons for these delays. Most significantly, the response time from upper management exceeded expectations, likely due to a lack of adequate follow-up. Additionally, delays were attributed to the user area's slow validation of market prices; in many cases, this necessitated a complete revision of the Terms of Reference (TOR) or Technical Specifications (TS), resulting in extensive rework. Furthermore, issues surrounding budget certification emerged, where inaccuracies in expenditures or accounts necessitated corrections originating from the initial generation of the requirement, ultimately impacting the TOR or TS. Finally, the time taken by the committee to prepare and approve the documentation was largely affected by their existing workload, as they prioritised tasks aligned with their original hiring objectives over timely procurement processes.

To reinforce the study, a cost-benefit analysis was conducted on the resources used by the entity for procurement management (see tab. 6; 7). This analysis compared the established timelines with the actual durations recorded in prior processes, highlighting the financial implications of resource utilisation and identifying opportunities for improving efficiency within the procurement framework.

Table 6

Management cost generate needs (Cost/day = $166)

	Description	Time Days	Cost $
A	Preparation and Delivery of TOR or TS	5	833.00
B	Referral of Conformity or Observations to TOR or TS	**3**	**500.00**
	Remission of Requirement and TOR or TS		
	Remission of Conformity or Observations upon Request		
C	Remission of Requirement and definitive TOR or TS	**3**	**500.00**
	Total cost of Phases 1	**11**	**1,000.00**

PHASE 1 (DAYS)	Activity cost ($)	Incidence (%)
21	**3,486.00**	**348.6%**
4	664.00	66.4%
4	664.00	66.4%
29	**4,814.00**	**481.4%**
6	996.00	99.6%
10	**1,660.00**	**166.0%**
4	664.00	66.4%
17	**2,822.00**	**282.2%**

PHASE 1 (DAYS)
23
8

Activity cost ($)	Incidence (%)
3,818.00	**381.8%**
1,328.00	**132.8%**

Table 7

Management cost preparatory acts

		Cost Day	$ 166.00
	Description	**Time Days**	**Cost $**
D	Reception of Authorisation Requirement by GM	**1**	**166.00**
E	Market study	**10**	**1,666.00**
F	Technical Validation of Quotations	**2**	**333.00**
G	Approval of Authorisation Form	**1**	**166.00**
H	Budget Certification	**1**	**166.00**
I	Approval of the Procurement File and Delivery to the designated Committee	**1**	**166.00**
J	Base Formulation	**5**	**833.00**
K	Approval of Bases	**1**	**166.00**
	Total cost of Phase 2	**22**	**3,662.00**

PHASE 2 (DAYS)
23
32
32
21
14
40
18
27
20
18

Activity Cost $	Incidence (%)
3,818.00	104.3%
5,312.00	**145.1%**
5,312.00	**145.1%**
3,486.00	95.2%
2,324.00	63.5%
6,640.00	**181.3%**
2,988.00	81.6%
4,482.00	**122.4%**
3,320.00	90.7%
2,988.00	81.6%

The entity demonstrates inefficiency in its procurement processes, with activities valued at two to three times their actual worth, leading to unnoticed economic deficits. Delays in procurement management stem from various factors – technical, operational, or economic – that can be addressed promptly.

However, the primary cause is internal management issues, particularly the lack of monitoring and accountability. Currently, processes rely on the willingness and patience of personnel. To improve this situation, the Kanban methodology was implemented, utilising tracking boards to maintain control over activities. This tool empowers the logistics department to oversee each task meticulously, aiming for effectiveness while ensuring greater efficiency through optimal resource utilisation (see fig. 10).

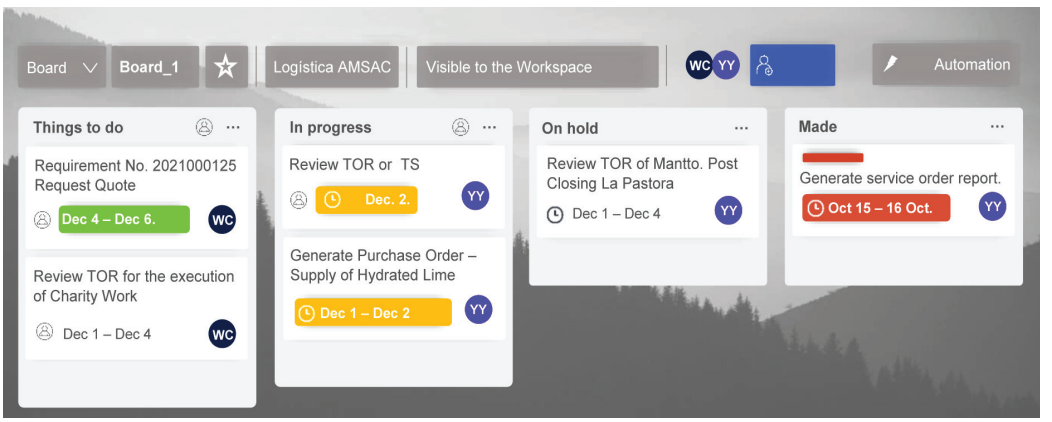

Figure 10. **Kamban board for activity management**

As a result of the analysis and the application of Yamazumi diagrams, enhanced performance indicators were established for each process. The elimination of non-value-adding activities within the production line, along with diligent monitoring of each node within the cycle, facilitates effective control over the timing associated with these nodes. Additionally, accurately costing each resource and assessing employee attitudes are integral to improving overall efficiency. Collectively, these actions contribute to the optimisation of the entire procurement process (see fig. 11).

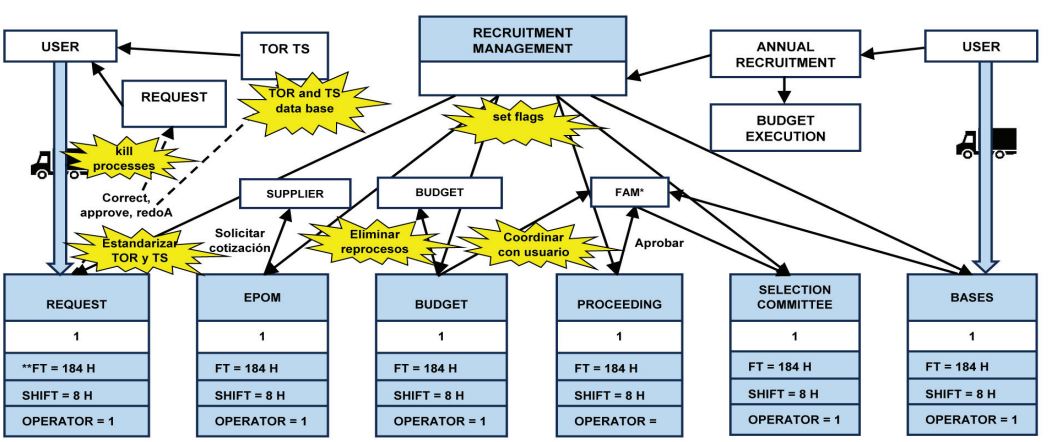

Figure 11. **Proposed VSM**

Notes: *FAM – financial administration management; **FT – full time.

Figure 12 illustrates the proposed new workflow for the process of generating needs. This refined workflow aims to enhance efficiency and clarity in the procurement process, ensuring that the identification of requirements is systematically addressed.

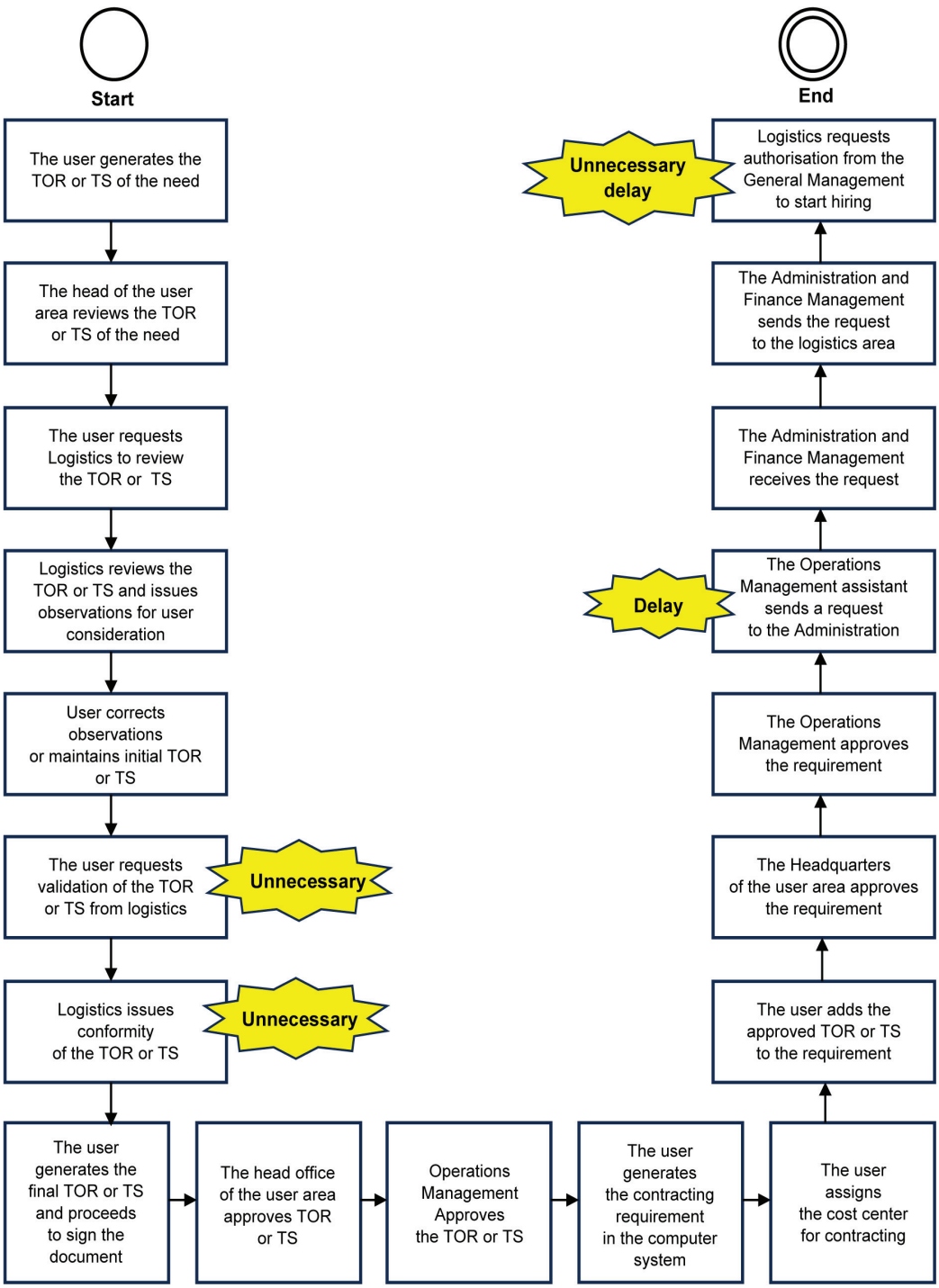

Figure 12. **Final flow of the generate need process**

Figure 13 presents the proposed new workflow for the preparatory acts process. This redesigned workflow aims to streamline the initial stages of procurement, ensuring that all necessary steps are clearly defined and executed efficiently.

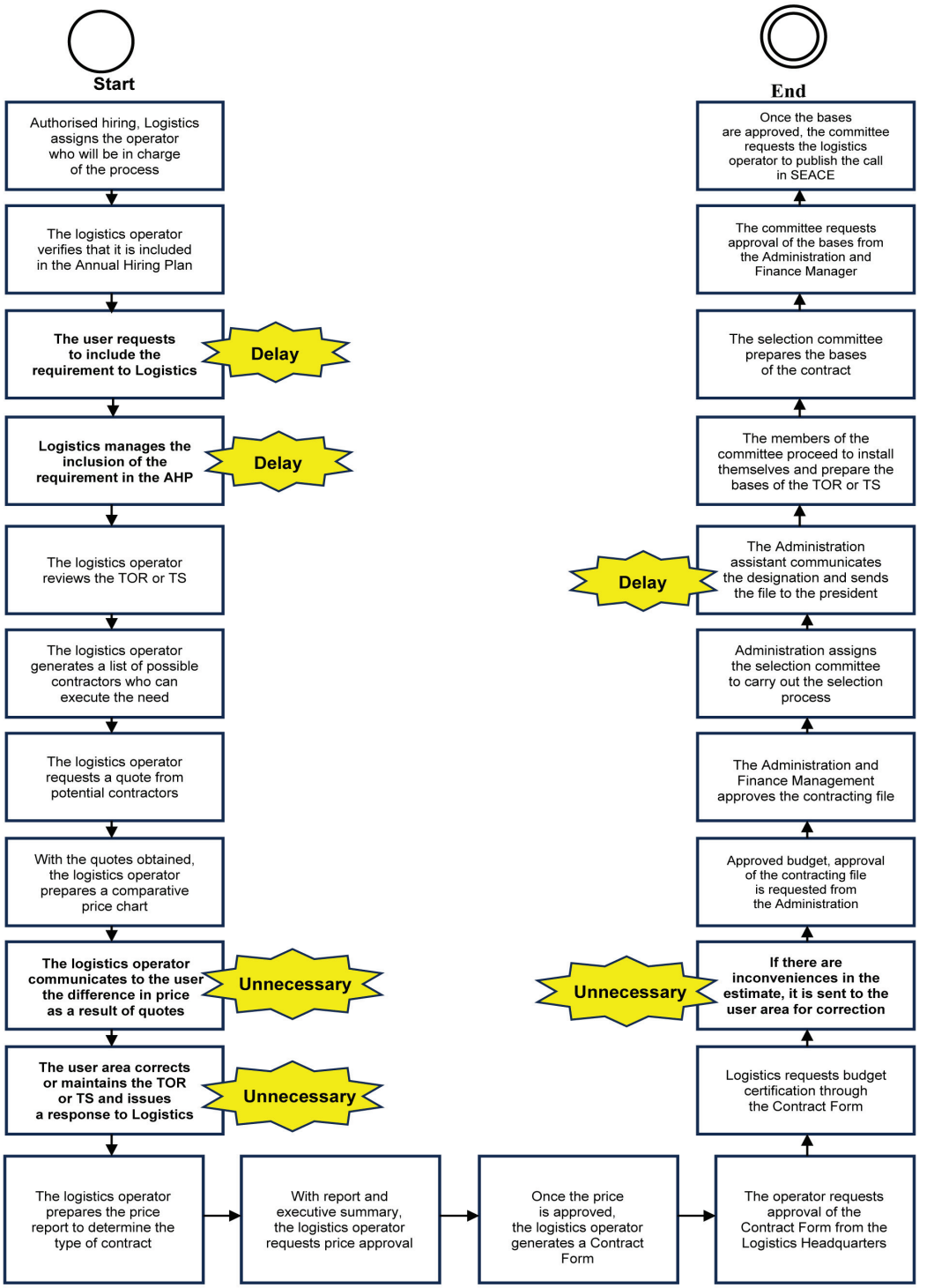

Figure 13. **Final flow of the preparatory acts process**

Discussion and implications

The research was aimed at proposing a model that reduces timelines and costs associated with requirements in public administration. In this context, the study of public procurement processes reveals a series of issues affecting the efficiency and effectiveness of resource management within the analysed entity.

The results indicate a significant lack of effectiveness in procurement processes, with 50% of executed processes falling outside established timelines, resulting in negative repercussions not only for the organisation but also for the social environment in which it operates. This situation can be attributed to various factors, including inadequate monitoring, a lack of standardisation in documentation, and inefficiencies in managing the user area's expectations. Throughout the research, it became evident that the primary obstacle to continuous improvement lies in internal management, characterised by a lack of empowerment among those responsible for each activity.

The implementation of methodologies such as Kanban and 5S, along with the standardisation of Terms of Reference (TOR) and Technical Specifications (TS), emerges as an effective response to the identified deficiencies. These tools not only enhance control over time and resources but also foster a culture of responsibility and continuous improvement among participants. The review of each phase of the procurement process, with a focus on eliminating non-value-adding activities, is an essential step toward optimising workflow.

Moreover, the research emphasises the importance of ongoing training for personnel involved in the procurement process. By providing adequate training, it is anticipated that the learning curve will be reduced, facilitating the implementation of new procedures and aligning all team members with the organisation's strategic objectives.

In conclusion, this research not only identifies shortcomings in the public procurement process but also proposes a practical framework to address them. The findings illustrate that improving procurement management is not merely a matter of process adjustment but involves transforming the organisational culture to value efficiency, transparency, and responsible use of public resources. Therefore, the implications of this research are significant, offering a pathway toward more effective management that will ultimately benefit both the organisation and society as a whole.

The research on optimising public procurement processes significantly enriches the theoretical landscape of public administration and procurement management. By incorporating contemporary methodologies such as Kanban and 5S, the study demonstrates their applicability in the public sector, enhancing the understanding of operational efficiency and the balance between standardisation and flexibility. It also addresses key barriers to effective procurement, such as inadequate empowerment and follow-up, laying the groundwork for further inquiry into governance and accountability within public organisations.

Practically, the proposed model provides a structured framework for reducing lead times and costs, enabling public entities to allocate resources more effectively. The emphasis on training and capacity building fosters a culture of continuous improvement, preparing personnel to adapt to evolving procurement challenges. Additionally, the focus on monitoring through performance indicators allows organisations to assess the effectiveness of interventions and make necessary adjustments.

By establishing a repository for standardised documentation, public institutions can streamline future procurement processes, minimising redundancy and enhancing service delivery. Ultimately, this research offers both theoretical contributions and practical strategies, facilitating meaningful improvements in public procurement practices for the benefit of organisations and the society they serve.

The proposed optimisation of public procurement processes, while presenting a systematic approach to enhance efficiency and effectiveness, is not without potential risks that must be considered. One significant risk is resistance to change. The implementation of new methodologies, such as Kanban and 5S, may encounter opposition from staff who are accustomed to traditional methods. This resistance could hinder the effective adoption of new practices, affecting the organisation's ability to achieve the proposed objectives.

Another important risk is insufficient training. If the training of personnel is not conducted adequately or comprehensively, there is a possibility that employees may not fully understand the new tools and processes. This could result in poor implementation, where the new practices are not applied correctly, thereby compromising the expected improvements in procurement management.

An excessive reliance on standardised documentation also poses a risk. While standardising Terms of Reference (TOR) and Technical Specifications (TS) can bring efficiency, an over-dependence might limit the necessary flexibility to adapt to specific situations or changes in the environment. This rigidity could lead to processes that do not adequately respond to the unique needs of each procurement.

Moreover, a systematic approach could inhibit creativity and innovation in developing solutions for specific needs. Rigid processes may lead to a mechanical approach rather than a proactive one, where the search for innovative alternatives for continuous improvement is encouraged. It is crucial for the organisation to strike a balance between standardisation and flexibility to maintain its adaptability and responsiveness to changing circumstances.

Inadequate evaluation of results also presents a significant risk. The proposal includes a monitoring and control system based on performance indicators. However, if the indicators are not carefully selected or do not accurately reflect the reality of the procurement process, the evaluated results could be misleading. This would lead to erroneous decisions and a false perception of improvement.

Additionally, the implementation of new methodologies could result in an uneven distribution of the workload among employees, especially if some adapt

more quickly than others. This could lead to increased work-related stress and dissatisfaction among staff, negatively impacting morale and ultimately the organisation's effectiveness.

The lack of commitment from top management is another risk to consider. The success of implementing any new model heavily relies on the support and involvement of senior management. If organisational leaders are not fully committed to the proposal, the resources allocated and the necessary attention to execute the change may be insufficient, limiting the proposal's impact.

Lastly, attention must be given to the legal and compliance risks that may arise during the restructuring of processes. Changes in practices may lead to misinterpretations of existing regulations and laws, generating legal risks. Therefore, it is crucial to ensure that the new practices align with applicable legal provisions to avoid sanctions or legal conflicts.

In summary, while the proposal has the potential to significantly improve efficiency in public procurement, it is essential to address these risks through careful planning, effective change management and continuous monitoring of results. This will ensure a successful and sustainable implementation, maximising the expected benefits for the organisation.

Conclusions

Agile tools have now become established as strategic alternatives to address and mitigate recurring challenges in organisational management, such as rework, bottlenecks and inadequate time management. However, their implementation should not be assumed as a universal solution or as an approach applicable to any situation without considering the particularities of the context. The effectiveness of these tools lies in their adequate adaptation to the specific conditions of each scenario and in the synergy generated by combining them with other approaches or methodologies.

In the context of public management, specifically in the area of contracting of the Public Prosecutor's Office in Peru, critical problems were identified related to delays in calls for tenders due to the lack of timely presentation of requirements for needs. Based on the detailed analysis of the times used in the activities of the preparatory acts phase, it was evident that the main bottlenecks were concentrated in the planning and needs generation stages. These included activities such as market research, budget determination and preparation of bases. This diagnosis allowed the formulation of a proposal aimed at optimising execution times, which, in turn, resulted in a reduction in the costs associated with the processes.

However, beyond the tools and processes, the human factor emerges as a critical element in achieving organisational objectives. The attitude of the participant is decisive, since their commitment and willingness to actively contribute represent the engine that drives the effectiveness of any initiative or strategy implemented. Without this active participation, efforts to improve management run the risk of becoming sterile efforts, compromising the expected results and the sustainability of the progress achieved.

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The article was submitted: 09.09.2023;
approved after reviewing: 14.10.2024;
accepted for publication: 08.03.2025.