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The Process Analysis in Purchasing 4.0: A Case Study of the Brass Strip Company

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Abstract

Supply chain management and logistics are the top priorities to help businesses have a competitive advantage. Purchasing is a strategic and essential segment of the Supply Chain as it is the first that drives the other supply chain steps. This research aims to study for procedure and duration of traditional purchases, to survey for method and time of purchasing 4.0, and finally, to compare and analyze both processes to explore the technology in the purchasing system for reducing process and duration and is suitable for investment or not. The population focuses on raw materials in six items used in production processes. The observation by participant observation is a tool to collect data on procedure and duration within four months. The data analysis uses a flow process chart showing the process flow of all information and the average period of 6 items. According to the study, adopting the purchasing process 4.0 can reduce the operational total of 2 steps. The total time of traditional purchasing operation was 876 minutes or 1.8 days, and the real-time purchasing 4.0 process was 452 minutes or 0.9 days, with actual purchasing time reduced by 424 minutes or 48.4 percent. The study results show that case study companies should improve their purchasing processes from traditional to purchasing 4.0 to lead to sustainable business growth and achieve long-term organizational goals.

Keywords: purchasing 4.0, development of purchasing, supply chain

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การวิเคราะห์กระบวนการของการจัดซื้อ 4.0 : กรณีศึกษาของบริษัทแปกทองเหลือง

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บทคัดย่อ

การจัดการโซ่อุปทาน และโลจิสติกส์จัดว่าเป็นสิ่งสำคัญที่จะช่วยให้ธุรกิจมีความได้เปรียบทางการแข่งขัน โดยการจัดซื้อนั้นมีความสำคัญต่อโซ่อุปทานเป็นอย่างมาก การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาวิเคราะห์กระบวนการจัดซื้อให้พัฒนาสู่การจัดซื้อ 4.0 ของบริษัทกรณีศึกษาแปกทองเหลืองโดยศึกษาขั้นตอนการดำเนินงาน และระยะเวลาในการจัดซื้อแบบดั้งเดิมและการจัดซื้อ 4.0 พร้อมทั้งทำการเปรียบเทียบขั้นตอนการดำเนินงาน และระยะเวลาของทั้ง 2 แบบ เพื่อวิเคราะห์ถึงการนำเทคโนโลยีเข้ามาใช้ในกระบวนการจัดซื้อว่าสามารถลดขั้นตอนการดำเนินงาน และระยะเวลาเหมาะสมต่อการลงทุนในระยะยาวหรือไม่ ประชากรคือวัตถุดิบหลักที่ใช้ในกระบวนการผลิตทั้งหมด 6 รายการ เครื่องมือที่ใช้เก็บรวบรวมข้อมูลในระยะเวลา 4 เดือน คือ การสังเกตโดยเป็นการสังเกตแบบมีส่วนร่วม และมีโครงสร้าง การวิเคราะห์ข้อมูลได้นำแผนภูมิกระบวนการไหลมาใช้ในการบ่งบอกถึงรายละเอียดขั้นตอนกระบวนการดำเนินงาน และระยะเวลา จากการศึกษา พบว่า การนำกระบวนการจัดซื้อ 4.0 มาใช้สามารถลดขั้นตอนการปฏิบัติงานได้ทั้งหมด 2 ขั้นตอน โดยการดำเนินงานจัดซื้อแบบดั้งเดิมมี 22 ขั้นตอนเวลาทั้งหมดคือ 876 นาทีหรือ 1.8 วัน และขั้นตอนการดำเนินงานการจัดซื้อแบบ 4.0 มี 20 ขั้นตอน เวลาทั้งหมด คือ 452 นาทีหรือ 0.9 วัน เมื่อทำการเปรียบเทียบทำให้พบว่าเวลาการจัดซื้อจริงลดลง 424 นาทีหรือคิดเป็นอัตราร้อยละ 48.4 เปอร์เซ็นต์จากการศึกษาทำให้ทราบว่าบริษัทกรณีศึกษาควรทำการพัฒนากระบวนการจัดซื้อจากแบบดั้งเดิมไปเป็นการจัดซื้อ 4.0 เพื่อนำไปสู่การเติบโตทางธุรกิจในระยะยาวอย่างยิ่ง

คำสำคัญ: การจัดซื้อ 4.0 การพัฒนากระบวนการจัดซื้อ โซ่อุปทาน

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Introduction

Supply chain management and logistics are the top priorities to help businesses have a competitive advantage. (Peter, 2019) A supply chain is the network of raw materials, processes, and information systems required to make and deliver a finished product. A well-organized supply chain can optimize production lifecycles and reduce costs for businesses. (Bals, Schulze, Kelly, & Stek, 2019) Purchasing is a strategic and essential segment of the Supply Chain as it is the first that drives the other supply chain steps. Good purchasing management has proven powerful leverage for savings and cost reduction. The purchasing department of the case study company consists of activities and responsibilities for purchasing raw materials, such as copper and zinc, and indirect materials, such as spare parts for control of the acquisition of timely and on-demand raw materials and managing the flow of accurate information and physicals best to meet the needs of business and production processes.

Nevertheless, in the purchasing process of a company case study, most processes are paper processes that start when the user needs to order, they will issue a purchase requisition (PR) document that is printed from the system and submitted to get approval to their manager to sign the purchase request and then bring the PR document to the Purchasing Department. When the purchasing department receives PR documents, they will request the quotation from the supplier and select it as meets the requirements. (Specification, Lead time, price) the purchasing department will fill in the purchase information in the system as a Purchase Proposal: PP and print the PP document to be presented to Purchasing manager and top management 3 executives for approval. After getting all approval, documents can be issued Purchase Order: PO and print the PO document to be presented to top management executive for signature confirmation in the PO before being sent to the supplier. However, such processes often need help with the work process, such as Delays due to most workflows focusing on paperwork, Errors of employees that may occur (Human error), and redundancy in the work process.

Technology is advancing, and more organizations are utilizing it in purchasing. Whereas a case study company still uses traditional paper in purchasing, which causes the problem mentioned above. Therefore, this study aims to analyze the process and the duration of traditional purchasing and purchasing 4.0 and compare traditional purchasing and purchasing 4.0 to analyze both processes to study if taking technology in the purchasing system and how much can reduce processes and increase efficiency. Furthermore, is it suitable for investment in the purchasing process or not?

Research Objectives

1. To study the traditional purchasing process and the duration of the company case study.
2. To study the purchasing 4.0 process and the duration of the company case study.
3. To compare the process and the duration the traditional purchasing and purchasing 4.0

Literature Review

Purchasing & Procurement in Supply Chain Management

Purchasing and procurement refer to all activities needed to obtain goods and services to run daily business operations. It involves sourcing vendors, negotiating contracts, purchasing items, receiving and inspecting goods, and recording all steps in the paperwork. (Luong, 2022) Procurement is a branch of supply chain management. Procurement aims to acquire the inputs you need to run daily business operations. Supply chain management includes upstream, midstream, and downstream deals with transforming those inputs into finished goods and product delivery to customers. (Leenders, Fraser, Flynn, & Fearon, 2006). Purchasing and procurement are responsible for procuring various raw materials according to the organization's needs, and these processes are processes linked in the supply chain upstream, midstream, and downstream. The procurement process also has related responsibilities in the supply chain, such as relationships with customers or customers customer Including suppliers of suppliers or in the production process like Supporting the production of goods and services to ensure continuity does not affect business operations, To obtain quality raw materials and reduce waste that occurs in the production lines, Make product design and product development efficient costs and expenses, Procurement in pursuit of raw materials with quality and price, Make a good image in the business that can procure raw materials or products that meet the needs of customers. (Weele, 2005). The supply chain aims to reduce costs and shorten the time within the supply chain and to add value and maximize customer benefits at the end of the supply chain. (Lambert & Copper, 1998)

Value chain and purchasing activities

The value chain concept by Michael E. Porter is a popular concept applied in management to create a competitive advantage in supply chain management and business organizations. (Naweekan, 2018) Bringing the above concept to explain the main activities and support activities

in the effective management of supply chains and business organizations (Porter, 1985). The concept of value chain management consists of the supply chain's main activities and supporting activities, which details important activities as follows. The primary activities are: Inbound Logistics, Operations, 'Outbound Logistics, Marketing and Sales and Service. Secondary activities are: Procurement is the management to create added value in the management of Procurement and Procurement to obtain raw materials or products with efficiency and effectiveness. It is a management process from identifying user needs to obtaining raw materials or products of users; Human Resource management - consists of all activities involved in recruiting, hiring, and training; Technological Development - pertains to the equipment, hardware, software, procedures, and technical knowledge, Infrastructure - serves the company's needs and ties its various parts together, it consists of functions or departments.

The information above shows that the purchase and procurement activities are the main supporting activity that is the first part of building the organization's competitive advantage that helps drive the 5 main activities above. Therefore, it is essential to study the details and create the correct to effectively manage core activities, business organizations, and supply chain management.

Purchasing 4.0

Technology plays such an important role in driving business and society with capabilities that are better than traditional systems in terms of speed and the ability and efficiency to work with fast images and sounds. many times, more than before, the various technologies today will help expand businesses and services rapidly and create convenience for consumers in the digital world. And if you don't catch up, another opposite effect could affect that industry sooner or later. Companies and agencies are paying more attention to cost management in a very competitive situation. The most efficient procurement management by bringing the procurement strategy has revolutionized the organization from procurement 1.0 to 4.0. The development can be described as follows. (Nigam, 2022)

Table 1 Purchasing Evolution 1.0 to 4.0

Purchasing 1.0	Purchasing 2.0	Purchasing 3.0	Purchasing 4.0
The period of characterized by manual or manual operations in work processes. It can also refer to operational procurement with an emphasis on tactical tasks and operational processes with an emphasis on risk reduction strategies. Demand Management (Wessel, 2022)	The period of cost control to value creation as the Internet and online media become more dominant in the industry in the era of Industry 2.0, and in procurement as part of the enterprise information revolution, the change in the field of operations is more complex. (Farangthong, 2018)	The period of a strategic approach that organizes the procurement of raw materials or products for focusing on order especially pays a lot of attention to time and in-depth market analysis.	The period of procurement that is part of the value chain integration) the technology is used in the operating system, operational, and procedures management, Including creating new products and services that are more relevant and digital. (Nigam, 2022)

Purchasing 4.0 strategies and frameworks (Figure 1) are revolutionizing operational process management, including creating new products and services. The concept of Purchasing 4.0 is the result of ever-changing and evolving technologies. Ultimately, organizations must determine their strategy, direction, and future procurement challenges and opportunities. The organization must consider the change. In Framework for adapting to organizational changes buying in this technology age is necessary (Wessel, 2022). The Strategy & Purchasing 4.0 framework focuses attention on six areas.

1. New procurement value proposition
2. Digital category and service procurement
3. Digital supply chain and supplier management
4. Innovative procurement data utilization
5. Digital processes and tools, and finally
6. Organization and capabilities

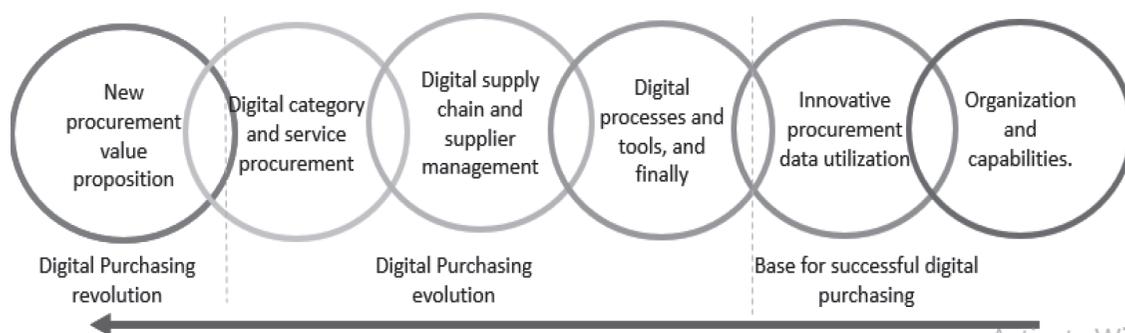


Figure 1 Purchasing 4.0 Strategies and Frameworks (Günthner, 2022)

Scope of Study

- 1) Scope of content: The Study and analyze the purchasing process from beginning to end of the traditional purchasing process and purchasing 4.0 process.
- 2) Scope of area: A Case Study of the Brass Strip Company.
- 3) Scope of population: The populations of this study are raw materials used in the production process of 6 items.
- 4) Scope of time: The study was conducted from Jan 2023 until Apr 2023.

Research Methodology

This mixed methods research was used to study purchasing process analysis for Purchasing 4.0. Qualitative research was used with the observation by participant observation as a tool to collect data on the purchasing process and duration. A quantitative research method was used with statistical value in timing using the average of purposive sampling of 6 items. “The mixed-methods research Designs has a design with convergent designs”. (Leedy & Ormrod, 2015, pp. 330-332)

This study aims first to study for procedure and duration of traditional purchases. Second, a study of the procedure and duration of purchasing 4.0, and finally, a Comparison and analysis of both processes. Data Collection from primary data by the observation by participant observation by structured observation, and secondary data the researcher has reviewed research articles related to theories that will use as a guideline for the implementation. The population is the raw material 15 items for use in the production process and select non-probability to purposive sampling is a technique to select the suitable sample qualification 6 items consisting of Copper Cathode, Zinc Ingot, Nickel Cathode, Pure Manganese, Aluminum Ingot, and Magnesium Ingot.

The data were collected at the brass strip company, a case study company, from Jan 2023 until Apr 2023. This research chose participant observation by structured observation, which is a tool to collect data by the researcher observing the operational processes of traditional purchases and purchasing 4.0. After that, the researcher then designs structured observations concerning validity and reliability. The results of content validity were measured by the Index of Item-Objective Congruence (IOC), resulting from 3 procurement specialists an average total score is 0.925. After that, the researchers used the structured observation for observed the duration of all 6 items in traditional purchasing and purchasing 4.0 from purchase request to received goods and used average statistics for analysis

The data analysis was performed by using a flow process chart for shows the process flow of all information and duration in the purchasing process by a flow process chart which is used to record detailed data to indicate the details of the work process to be able to see from the beginning to the end of the process so that the results can be clearly analyzed according to the objectives.

Research Results

The objective was to study the process and duration of traditional purchasing and purchase 4.0 and compare the process and the time the traditional purchasing and purchasing 4.0 for analysis purchasing process to purchasing 4.0. In this research, the researcher used observation tools through participatory observation to collect the purchasing process data and average duration of sample group 6 items of the traditional purchasing and purchasing 4.0 per each process.

1. The study results of the operation process and duration of the traditional purchasing.

The study of the traditional purchasing process found that there are 22 activities, and it can divide into 6 Steps. After that, the researcher timed all sample groups 6 items with each activity (22 activities) and averaged each activity, which can be summarized below.

Step 1: The purchase request (PR) includes 3 activities that are 1.the user input purchase requests into the EIS system,2.print purchase request (PR) document and 3. submit a proposal to the production manager for review and approval. The average total time is 84 minutes to complete.

Step 2: After the purchasing department receives the purchase request (PR), include 3 activities that are 1. purchasing dept. receive the purchase request (PR) document, 2. Review the purchase request (PR) document and 3. Request a quotation from the supplier. The average

total time is 184 minutes to complete.

Step 3: Issuing a purchase offer document or Purchase Proposal (PP) includes 2 activities that are 1. Input quotation detail to the EIS system and 2. Print Purchase Proposal (PP) document. The average total time is 17 minutes to complete.

Step 4: Proposal presentation or Purchase Proposal (PP) to executives includes 8 activities that are 1. Purchasing officer reviews the purchase proposal document, 2. Purchasing manager reviews the purchase proposal document and approval in the document, 3. The Vice president's administration reviews the purchase proposal document and approval in the document, 4. The finance controller reviews the purchase proposal document and approval in the document, 5. The president reviews the purchase proposal document and approval in the document, 6. The purchase Proposal document is fully approved, 7. Print Purchase Orders from the EIS system, and 8. The Vice president's administration signed in the document Purchase Order. The average total time is 301 minutes to complete.

Step 5: Issuing a purchase order or Purchase Order (PO) includes 1 activity: Purchasing submitting a Purchase Order to the supplier. The average total time is 5 minutes to complete

Step 6: Follow up and receive the product. Include 5 activities that are 1. Follow-up and coordination between supplier, Warehouse & Logistics, 2. Supplier sends raw material, 3. Warehouses recheck raw material, 4. Purchasing receives the document from Warehouse & Logistics, 5. Collect all documents (Invoice, packing list, PO) and submit them to the Accounting dept. The average total time is 282 minutes to complete

Studying the process and duration of traditional purchasing found that the most time-consuming internal process is Step 4, Purchasing Proposal (PP) to executives, which takes an average total time is 301 minutes. Indicating that the internal documentation process caused the delay. Having to present to management through paperwork at every step of the process leads to time-consuming and time-consuming delays. Therefore, the researcher studied that if we bring purchasing 4.0 or use digital technology in the purchasing system in terms of electronic signatures, approval, and approval can be obtained through the system from the purchase request process to purchase order. How much can it reduce the process and duration? Since the case study company has never done a study in this field before, the researcher has continued to study the process and duration of purchasing 4.0, with the results and duration in Section 2.

2. To study the purchasing 4.0 process and the duration of the company case study.

The study of the traditional purchasing process found that there are 20 activities, which can be divided into 6 Steps. After that, the researcher timed all sample groups 6 items with each activity (20 activities) and averaged each activity, which can be summarized below.

Step 1: The purchase request (PR.) includes 2 activities that are 1. the user input purchase requests into the EIS system and 2. submitting a proposal to the production manager for review and approval by the system. The average total time is 33 minutes to complete.

Step 2: After the purchasing department receives the purchase request (PR), include 3 activities that are 1. purchasing dept. receive the purchase request in the system (PR) document, 2. review the purchase request (PR) document and 3. Request a quotation from the supplier. The average total time is 33 minutes to complete.

Step 3: Issuing a purchase offer document or Purchase Proposal (PP) includes 2 activities: 1. Input quotation detail to the EIS system and 2. Print Purchase Proposal (PP) document. The average total time is 17 minutes to complete.

Step 4: Proposal presentation or Purchase Proposal (PP) to executives includes 7 activities that are 1. Purchasing officer reviews the purchase proposal document and approval in the system, 2. Purchasing manager reviews the purchase proposal document and approval in the system, 3. The Vice president's administration reviews the purchase proposal document and approval in the system, 4. The finance controller reviews the purchase proposal document and approval in the system, 5. The president reviews the purchase proposal document and approval it, 6. The purchase Proposal document is fully approved, and 7. Print Purchase Orders from the EIS system. The average total time is 92 minutes to complete.

Step 5: Issuing a purchase order or Purchase Order (PO) includes 1 activity: Purchasing submitting a Purchase Order to the supplier. The average total time is 5 minutes to complete.

Step 6: Follow up and receive the product. Include 5 activities that are 1. Follow-up and coordination between supplier, Warehouse & Logistics, 2. Supplier sends raw material, 3. Warehouses recheck raw material, 4. Purchasing receives the document from Warehouse & Logistics, 5. Collect all documents (Invoice, packing list, PO) and submit them to the Accounting dept. The average total time is 272 minutes to complete.

They are studying the process and duration of purchasing 4.0 found that the use of digital technology in the procurement system helps to speed up operations and can reduce 2 unnecessary activities. The organizer has compared the traditional purchasing process and purchasing 4.0 to how much can reduce the work process and duration. Please find the comparison table of procedures and time for traditional Purchasing and Procurement 4.0 in section 3.

3. Comparison of procedures and duration in traditional purchasing and purchasing 4.0

A comparison of traditional purchasing procedures and purchasing 4.0 will show the work process and duration of both forms. The information below shows an average comparison of the direct materials or main raw materials of the 6 items.

Table 2 Comparison of Procedures and Duration in Traditional Purchasing and Purchasing 4.0

Step	Operation process	Traditional purchasing					Purchasing 4.0						
		Activity type					Average Duration	Activity type					Average Duration
		○	⇨	◐	◑	▽	Minutes	○	⇨	◐	◑	▽	Minutes
1	1 Input purchase requests into the EIS system.	●					19	●					20
	2 Print purchase request (PR) document.	●					4						-
	3 Submit a proposal to the production manager for review and approval.				●		61				●		13
2	4 Purchasing Dept. received the purchase request (PR) document.		●				156		●				5
	5 Review the purchase request (PR) document.				●		10				●		10
	6 Request a quotation from the supplier.	●					18	●					18

Table 2 Comparison of Procedures and Duration in Traditional Purchasing and Purchasing 4.0 (cont.)

Step	Operation process		Traditional purchasing					Purchasing 4.0						
			Activity type					Average Duration	Activity type					Average Duration
			○	◀	▶	□	▽	Minutes	○	◀	▶	□	▽	Minutes
3	7	Input quotation detail to the EIS system	●					12	●					12
	8	Print Purchase Proposal (PP) document.	●					5						5
4	9	Purchasing officer reviews the purchase proposal document.				●		5				●		7
	10	Purchasing manager reviews the purchase proposal document and approval.				●		26				●		9
	11	The Vice president's administration reviews the purchase proposal document and approval.				●		61				●		18
	12	The finance controller reviews the purchase proposal document and approval.				●		63				●		22
	13	The president reviews the purchase proposal document and approval it.				●		83				●		26
	14	The purchase Proposal document is fully approved.		●				23		●				5
	15	Print Purchase Orders from the EIS system.	●					5	●					5
	16	The Vice president's administration approves the Purchase Order.				●		35				●		-

Table 2 Comparison of Procedures and Duration in Traditional Purchasing and Purchasing 4.0 (cont.)

Step	Operation process		Traditional purchasing					Purchasing 4.0													
			Activity type					Average Duration	Activity type					Average Duration							
			○	◁	◐	◑	▽	Minutes	○	◁	◐	◑	▽	Minutes							
5	17	Purchasing submit a Purchase order to the supplier.		●								5		●							5
6	18	Follow-up and coordination between supplier, Warehouse & Logistics.	●									26	●								27
	19	Supplier sends raw material		●								74		●							64
	20	Warehouses recheck raw material				●						90				●					90
	21	Purchasing receives the document from Warehouse & Logistics				●						60				●					58
	22	Collect all documents (Invoice, packing list, PO) and submit them to the accounting dept.		●								32		●							33
			Purchasing process / Total duration (Minutes)	22 activities.					873	20 activities.					452						
		Entire duration (Day)	1.8 days					0.9 days													

According to the study, adopting the purchasing process 4.0 can truly reduce the process and duration. Implementation and actual purchasing time reduce all active steps into 2 steps and facilitate the implementation time. The total time of the traditional purchasing operation was 876 minutes or 1.8 days, and the total time of purchasing 4.0 operation was 452 minutes or 0.9 days, with actual purchasing time reduced by 424 minutes or 48.4 percent. This is evident from Step 4. Traditional purchasing includes 8 activities. The average total time is 301 minutes to complete. Purchasing 4.0 consists of 7 activities. The average total time is 92 minutes to complete. The duration reduction represented 69.4 percent. At this step, operational activities can be reduced to 1 step, which is the process of the vice president’s administration approving the Purchase Order. This process can reduce time due to the traditional purchasing used document. The purchaser

must make a paper signing presentation starting with approval from the purchasing manager. And later, all 3 executives, by presenting to each executive, will take a long time having to wait for each person to sign for approval to bring the document to the next executive for approval in that time we must wait caused a lot of delays. But when implementing the procurement 4.0 model, it was found that submitting such documents can greatly reduce the processing time because when the procurement manager approves the purchase request, it is sent in the system to the management immediately. The study results show that case study companies should improve their purchasing processes to apply the technology to the process for changing the process from traditional document to evolving purchasing 4.0. Applying technology software helps to work more efficiently, reduce time, and save costs over a long time and is suitable for investment.

Research Summary

Current purchasing processes still use paper to get approval to purchase processes and often encounter many problems in the work process, such as delays due to most workflows focusing on paperwork and redundancy in the work process. As opposed to the modern world with modern technology. However, investment in the procurement process must be clear to support that if a company changes from a paper procurement system to technology, it will be able to reduce the steps and time required.

1. The study of the traditional purchasing process found that the purchasing process there are 22 activities, and it can divide into 6 Steps. After that, the researcher timed all sample groups 6 items with each activity (22 activities) total average time is 301 minutes to complete. We found that the most time-consuming internal process is Step 4, Purchasing Proposal (PP) to executives, which takes an average total time is 301 minutes. Indicating that the internal documentation process caused the delay. Having to present to management through paperwork at every step of the process leads to time-consuming and time-consuming delays. Therefore, the researcher studied that if we bring purchasing 4.0 or use digital technology in the purchasing system in terms of electronic signatures, approval, and approval can be obtained through the system from the purchase request process to purchase order. How much can it reduce the process and duration? Since the case study company has never done a study in this field before, therefore, the researcher has continued to study the process and duration of purchasing 4.0, with the results and duration in Section 2.

2. The study of purchasing 4.0 found that after we take the technology in the purchasing process, there are 20 activities, and it can be divided into 6 Steps. After that, the researcher

timed all sample groups 6 items with each activity totaling 452 minutes. The technology helps to speed up operations and can reduce 2 unnecessary activities. The organizer has compared the traditional purchasing process and purchasing 4.0 to how much can reduce the work process and duration. Please find the comparison photo of procedures and time for traditional Purchasing and Procurement 4.0 in section 3.

3. A comparison of traditional purchasing procedures and purchasing 4.0 will show the work process and duration of both forms. The information below shows an average comparison of the direct materials or main raw materials of the 6 items. Adopting the purchasing process 4.0 can reduce the operational process and time. Implementation and actual purchasing time reduce all active steps into two steps and facilitate the implementation time. The total time of the traditional purchasing operation was 876 minutes or 1.8 days, and the whole time of the purchasing 4.0 operation was 452 minutes or 0.9 days. The Actual purchasing time reduces by 424 minutes or 48.4 percent. The study results show that case study companies should improve their purchasing processes from traditional to evolving purchasing 4.0 approaches for applying technology software for helps to work more efficiently, reduce time, and save costs over a long period of time and suitable for investment.

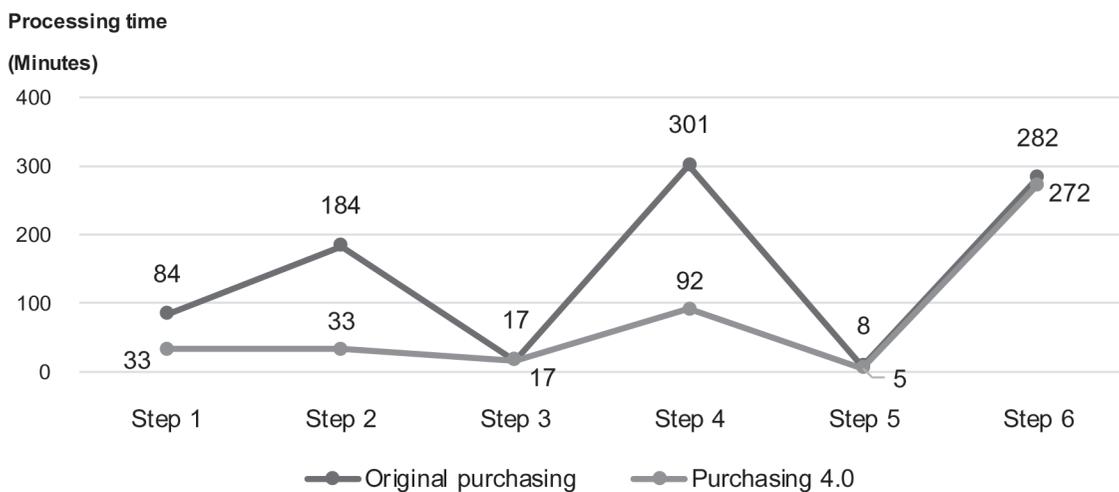


Figure 2 A Comparison of Traditional Purchasing Procedures and Purchasing 4.0 (Author)

Discussion

Only 6 per cent of the procurement leaders in the survey believe that their digital procurement strategy will help them to deliver on their objectives and improve enterprise value fully. Only 18 per cent of procurement leaders have a digital procurement strategy supported by a complete business case. (Günthner, 2022) To fully exploit this potential, the first step is a careful digital strategy and vision. These should be action-oriented, scalable and flexible, especially to integrate new technologies and approaches. Especially to incorporate new technologies and approaches that have defined a 4-step to implement digitalization in purchasing are 1. Identify potentials and set goals 2. Selection of the tools and the team 3. Digitalization of Procurement based on customer, product and supply chain 4. Tracking and revision. After studying it, it is known that using digital technology can help the work process have less wasted activities and shorten the operation time. In this regard, reducing time reducing such a waste of competitiveness that has a high level of competitiveness and always finding a self-development consistent with the theory of Michiel R. Leenders and many scholars give the views of An evolving approach to an integrated procurement process, essentially Supply Support Strategies, means using all kinds of methods to support purchasing to be able to operate efficiently Able to receive information as soon as there is a change by organizations interested in improving the procurement process can guide. (Weele, 2005). The study and research principles are used as guidelines for application in the organization, separated into the following issues:1. On the side of the manufacturer, the manufacturer can receive orders faster, allowing Preparing raw materials for delivery on time and more accurately 2. Entrepreneurship From studying the current situation and finding ways to develop yourself to increase the ability to make the traditional work with problems or delays. To develop and improve by bringing technology to play a role in increasing the potential to be suitable and following their own operating processes to achieve more efficient work and can also reduce the time of operation, making the Efficient operations personnel. Purchasing has more time to add value to development work in other areas and also saves personnel costs .3. The customer side from the upstream process that speeds up results the downstream process of delivering goods to customers is faster, more accurate, and less error-prone.

Recommendation

1) Recommendations for implication

Based on the results of the purchasing dept, there is often a problem of delays caused by studying their operational models to understand and find new ways to be used to benefit future work. In the age of modern technological change, we are constantly improving ourselves for competitiveness. Purchasing is becoming increasingly important - also in terms of increasing profits. This department must be given adequate attention, resources, technology, and talent to maximize value creation. After all, purchasing is also the main instance for the security of supply. (Günthner, 2022)

2) Limitations and recommendations for future research

In this research, the researcher only studied the process and duration of traditional purchasing and purchasing 4.0 in the following analysis: the operation cost should be a deciding factor. And support the results of additional studies.

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