

Business Process Reengineering of the Purchasing department of Lezzon Philippines Inc using ERP System

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Abstract

The Enterprise Resource Planning (ERP) is a system that aids in making a business process to move effectively and efficiently. Many companies are using it to make their process more systematic and efficient. It is because the system cannot just automate the processes in the company. Still, it can also make the company's processes convenient and efficient in terms of performance and output. The ERP system can also make transactions between the company, its clients, and suppliers. With the company's current process, there is a problem in the company's particular department, the Purchasing department. The problem with the current process in this department is the delay in the operation. The inefficient process in the business, the disorganized or missing documents because of the manual operation that occurred in the said department, and lastly, the methods of creating purchase requisition and purchase order to the supplier manually through phone call or email. It also resulted in a high number of lead times and slowed down the process in the said department. In this study, the researchers interviewed the owner and gathered their sample reports for them to analyze the problem deeper. Through the process, they used process map, root-cause analysis, and flow process chart. To address the company's problem in terms of their problem regarding the purchasing department, the group came up configuring an ERP system using SAP HANA. The system is composed of processes such as creating the purchase requisition, purchase order, issuing goods receipt, receiving invoice, and paying to the vendor, which is all done manually with the current process. With the said ERP system using SAP HANA, the group solved the problems in the company's purchasing department, which are the manual creation of purchase requisitions and purchase orders, disorganized documents, and ineffective business processes. As a result of the flow process chart, the proposed process reduced the lead time of the purchasing department to a total of 83 minutes compared to 245 minutes that occurred in the current process.

Keywords

Business Process Reengineering, ERP System, SAP HANA, Purchase Requisition, Purchase Order

1. Introduction

Lezzon Philippines Paint and Chemicals Co., formerly known as Ktoria Enterprises, is one of the country's leading automotive paint manufacturing companies that has gained one of the highest recognitions from its clients over the past five years in the market through steady growth. The owner, Jun Abayle, started the business way back in 2011, and it's been one of the top automotive paint manufacturing in the market since 2016. With products that cater to every aspect of the automotive paint industry demands, the company can compete globally. It has successfully developed respected, high-quality products available to all domestic clients through an extensive range of distributors. Every new high-performed product is innovated with our four milestones: Product Performance, Cost-Benefit, Environmental and Social Awareness, and Employee Safeguard. When clients order from the company, they do it through a phone call and emails them their purchase order. When following up orders to their clients, they also do it through phone calls. They record all transactions in an excel file which includes the orders and delivery date. When ordering materials to the supplier, the warehouse supervisor double checks and lists the raw materials needed and then sends a purchase order to the suppliers through email. For the purchasing department, they experience a delay in purchasing raw materials to their suppliers. It is because of the company's manual process in creating purchase requisition and

purchase order. The company is doing it manually, and it's being sent to their clients through a phone call or email only. That's why the company has a high number of lead times. The company's overall operation and process have been affected because of the delay and high number of lead time in the purchasing department. This statement concludes that the company only uses phone calls, emails, and excel files which may cause problems and misunderstandings. They do not have any ERP system that may help their business process, such as keeping track of all the moving parts of purchasing, manufacturing, and distribution efficiently and effectively. An ERP system is beneficial for the company. It will allow different departments to enter data into a single database, and it would not be difficult to keep track of other transactions. It can also prevent one of the company's current problems, which is the delay in the delivery of the products to the customers because there is no system to track the delivery date of the orders.

1.1 Objectives

The researchers aim to achieve the following objectives:

- To incorporate the Enterprise Resource Planning (ERP) system to improve the overall process of the company.
- To improve purchasing process by lessening the duration and improve productivity.
- Lessen the lead time that occurred in the purchasing process.
- To have a system that records the orders together with its delivery date

2. Literature Review

An Enterprise Resource Planning or ERP is a system integrated software application that standardizes, streamlines, and integrates business processes across finance, human resources, and other aspects of businesses. Security and storing of data information is also a proven benefit of acquiring an ERP System because during the processes or managing of the information within the facility. It can be easily stored on the system itself and can be used or kept safe whenever the business needs to recollect past transactions or information regarding the business (Perkins,2020). Also, generating ERP to the system can provide help on communication within the business areas, which can produce more efficient and accurate information regarding data needed for the process. Implementing an ERP system is quite tricky and overwhelming as stated in the article because it is a large step in improvising the required processes to manage the actions for it to be more efficient and convenient than before (EPICOR, 2021). Technological advancement is one of the factors of process improvements; today, many processes or innovations have been manufactured for it to have capabilities that no man can provide. It's understandable because not all men can provide efforts that technology can (Wedell, 2020). With process improvements, a lot can be done about the functions and capabilities of the process workflow and the team's performance, which can be more efficient and accurate regarding the information and innovation of technologies. One company that implemented an ERP system is MacKay & Sposito. A civil engineering firm that was having difficulty measuring financial transactions and information, and as stated in the article once they connected their entire business and implemented an ERP system, improved their processes, cash flow, and profitability information regarding their processes (Berkowski, 2018). An ERP system can affect many processes because it is a centralized database that can serve as a hub or server for the whole organization; it can also provide optimization regarding the flow of the processes inside to enhance its capabilities to produce a more reliable outcome for the organization (Solutions, 2013). Western Digital is a technology company that was planning to implement an ERP system to improve their status regarding their processes and data management within their business (Inc, 2020). One factor that implementing an ERP can benefit the company is its data management and its centralized system wherein it can help with the storage and storing of data whenever it is needed for the entirety of the business. (Young, 2020)

3. Methods

This chapter presents the methods and tools used to identify the current situation, analyze results of data and the proposed future design of the system.

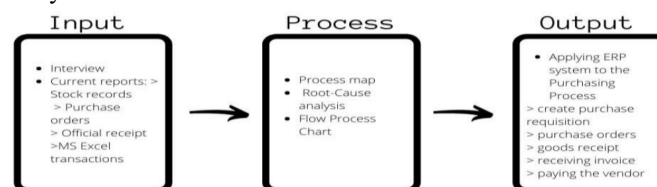


Figure 1. IPO Diagram

In figure 1, the researchers shows the IPO diagram of the study. They were able to define the current purchasing process of Lezzon Philippines Inc through an interview with the President, Jun Abayle and Purchasing Manager, Keesha Kitagawa. They were asked about their company such as their company background, organizational structure, current business process and problems in their business operations. Researchers also asked for sample documents that they are using throughout the process, such as emails regarding purchase orders, official receipt, and recorded transactions in MS Excel. Furthermore, the group utilized a process map to display the current process of the company's purchasing process. With this, the researchers may analyze and identify the weak and strong points of their process. And to be able to determine the root of the problem, a root-cause analysis was used wherein the result will be used throughout the study. Another is the use of the Flow Process Chart. This chart determines the failure points that can be eliminated in the process. It also helps in comparing the duration of the current and proposed process. Based on the said challenges in the current process, it is important to plan and improve processes to avoid downfall of the organization. The company's goal is to improve their business that allows transparency across the organization and save time. In the current process, tasks take too long to be done by different departments, especially the Purchasing Department since they use calls and emails to transact with suppliers. The researchers thought of applying a system that will help avoid their problems throughout the process. They created a new business process for the Purchasing department using a system. They can create purchase requisition, purchase orders, goods receipt, receiving invoice, and paying the vendor through the system. New workflows and procedures need to be designed once the company will use a system. Of course, Lezzon Paint Inc will change their current business process so there will be a huge adjustment between the organization and the supplier.

4. Results and Discussion

4.1 As-is process(es) of the selected system (s) (Process model and discussion of pain points/weaknesses)

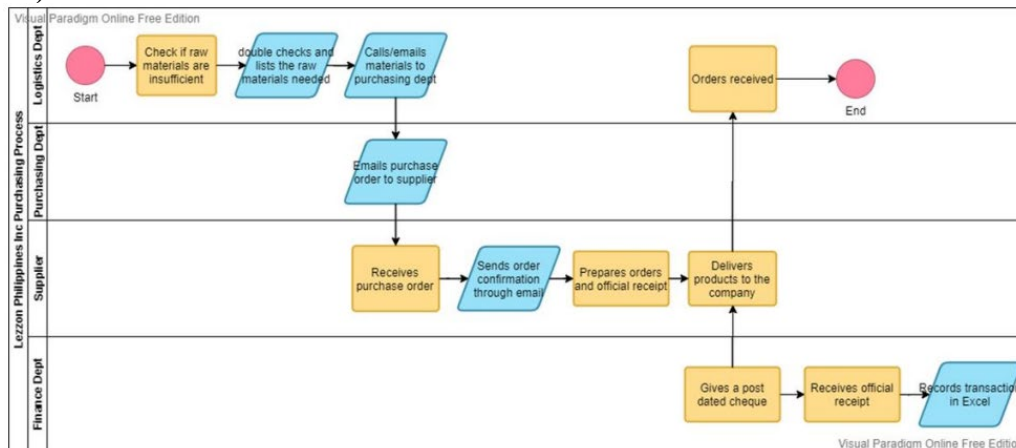


Figure 2. As-is Process

Figure 2 shows the as-is process of Lezzon Philippines. The purchasing department process starts when the warehouse supervisor checks if there are insufficient raw materials. Then, they double-check and list the raw materials needed in their phone or a piece of paper. They call or email the purchasing department these raw materials to be ordered from the suppliers. The purchasing department calls or emails their purchase order to the supplier and the supplier sends an order confirmation through email. Suppliers will then be preparing the ordered raw materials and the official receipt. After that, they deliver orders to the company's logistics department and financial department, give a post-dated cheque and receive the official receipt which will be recorded in MS excel.

Determine the cycle time of the process(es)

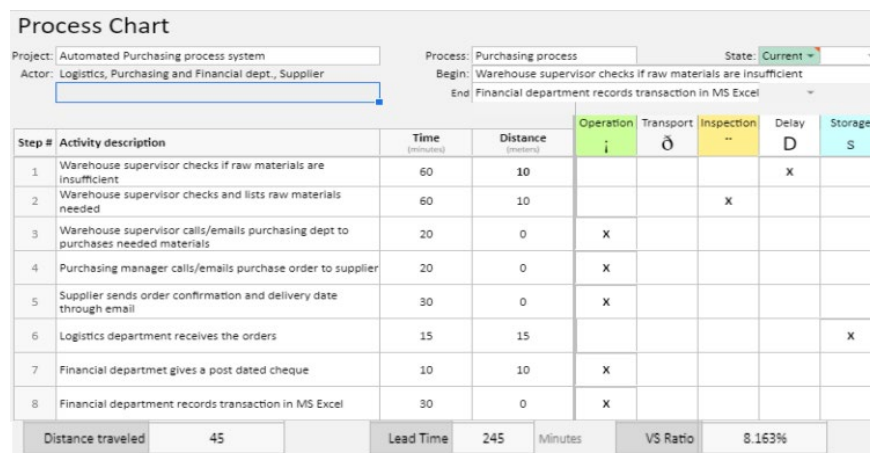


Figure 3. Process Chart

Figure 3 shows the current process in the purchasing department of Lezzon Philippines Paint and Chemicals Co. The delay is because of the manual operation that occurred in this particular department. The checking and listing of the raw materials needed has been done through an excel file. The sample document report can be seen in the current reports as figure 1 which is the stock records needed for Thainakorn paint Corporation. Next is that the company also sends purchase orders to their suppliers through a phone call or email only since they don't have an ERP system. Sample documents of their purchase order can be seen in figure 2 of current reports of the company. Sample purchase order stated the raw materials needed to be ordered in one of their suppliers, Slimtex Industries Incorporated. They do not also receive a soft copy of the official receipt from their supplier; hence, the company provides them a hard copy of the official receipt once the goods have been delivered to them. Sample official receipt that can be seen from figure 3 of the current reports is from Slimtex Industries Inc. also. Another problem of Lezzon Philippines Paint and Chemicals Co. is that the company's transaction record has been recorded through excel file only. It can be prone to errors which may cause trouble to the purchasing department of the company. The lead time will be 245 minutes for the process because of delay and human errors. Sample documents of the transaction record can be seen in figure 4 of current reports of the company.

Current reports of the company

THAINAKORNPAIN and Chemical Corporation Limited						THAINAKORNPAIN and Chemical Corporation Limited											
CODE	DESCRIPTION	SIZE	PACKING	Weight per Unit (KG.)		CARTON SIZE (cm)			CODE	DESCRIPTION	SIZE	PACKING	Weight per Unit (KG.)		CARTON SIZE (cm)		
				N.W.	G.W.	W	L	H					N.W.	G.W.	W	L	H
EuroColour PRIMER (สีพื้น)																	
E2300	MS 2K PRIMER 4:1 (WHITE)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	E100	DEGREASER	1 LITRE	12	0.90	1.00	37.0	24.0	23.0
E2400	MS 2K PRIMER 4:1 (LIGHT GLAY)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	E100	DEGREASER	3.785 LITRE	6	3.20	3.50	34.0	22.5	27.5
E2500	MS 2K PRIMER 4:1 (GLAY)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	E100QUICK	DEGREASER FAST-DRY	3.785 LITRE	6	3.20	3.50	34.0	22.5	27.5
E4400	MS HARDENER For E2300,E2400,E2500	1.00 LITRE	6	1.00	0.90	27.0	17.5	24.0	EuroColour POLISHING AGENT (บะลัด)								
E240	MS 2K PRIMER 4:1 (GLAY)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	EXTRA100	RUBBING COMPOUND	500 G	4	3.20	3.50	36.0	24.0	18.0
E242	MS 2K PRIMER 4:1 (LIGHT GLAY)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	EXTRA100	RUBBING COMPOUND	3.5 KG	12	0.45	0.50	36.0	24.0	13.0
E245	MS 2K PRIMER 4:1 (BLACK)	3.785 LITRE	4	5.20	5.50	34.8	34.3	21.3	CARCREAM	CAR CREAM	250 G	12	0.20	0.25	33.0	23.0	11.0
E444	STANDARD HARDENER	500 ML	12	0.45	0.50	41.5	15.5	15.0									

Figure 4. Stock records needed for Thainakornpaint Corp.

company integrated the system in creating the purchase requisition. In this example, it is being shown the purchase requisition for the needed raw materials and sample purchase order to be made for one of their suppliers which is Ajaycee Chemicals. Next, the proposed system can also generate receipt and invoice systematically. The company only received a hard copy of the official receipt from their supplier once the order has been delivered to the client. The sample output in the system can be seen in the proposed screenshots of the improved process as figure 9. Another thing that the ERP system resolves is the payment of the raw materials to the vendor. Before it's being done when the delivery team delivers the goods to the company, that's the time they're going to issue a post-dated cheque as payment. With the proposed process, the system is being integrated to the bank account of the company. After the company has made their order, they can already pay the vendor, just like the example seen in figure 10.

Sample Screenshots of the improved processes

The screenshot displays the SAP Purchase Requisition and Purchase Order (Print Preview) interface. The main window shows a list of items with columns for Item, Material, Short Text, Quantity, Unit, C, Deliv. Date, and Mat. Group. The items listed are:

Item	Material	Short Text	Quantity	Unit	C	Deliv. Date	Mat. Group
40	MSTP1021	21 Masking Tape	50	EA	D	04/04/2021	Safety Gear
50	RBCM1021	21 Rubbing Compound	10	EA	D	04/07/2021	Safety Gear
60	HOPN1021	21 House Paint	10	EA	D	04/07/2021	Safety Gear
70	INPN1021	21 Industrial Paint	10	EA	D	04/07/2021	Safety Gear

Below the table, the 'Material Data' section shows 'Material: AUP1021' and 'Short Text: 21 Automotive Pa'. The 'Supplier Material' is 'SFTY' and 'Safety Gear'. The 'Purchase Order' section shows 'PO number: 4500000056 / 04.05.2021' and 'Contact person: 21 Muntinlupa PW'. The 'Terms of payment' are 'Payable immediately Due net' and 'Currency: PHP'. The 'Please deliver to:' section shows 'Company: 21 Plant Muntinlupa' and 'Unit: C-2 RMT Industrial Park Tunas' and '1773 Muntinlupa'. The 'Total net value excl. tax: PHP 16,500.00' is displayed at the bottom.

Figure 8. Purchase Requisition and Purchase Order (Print Preview)

Figure 8 is the purchase requisition wherein the researchers enter the products and adds to the table. They also entered its quantity, code and material group. For the purchase order, this serves as a summary of the ordered materials. It also shows the address where it is to be delivered.

The screenshot displays the SAP Goods Receipt and Receive Invoice interface. The main window shows the 'Enter Incoming Invoice: Company Code: PH01' screen. The 'Transaction' is 'Invoice' and the 'Balance' is '6.00'. The 'Invoice date' is '05/04/2021' and the 'Posting date' is '05/04/2021'. The 'Amount' is '6.00' and the 'Tax amount' is '0.00'. The 'Company Code' is 'PH01' and the 'Company Name' is 'Luzon Philippines Inc. Muntinlupa'. The 'GL Account' is '1500000001' and the 'PO Reference' is '1500000001'.

Figure 9. Goods Receipt and Receive Invoice

Figure 9 is the goods receipt and receive invoice wherein the company makes the invoice for the specific company.

The screenshot displays the SAP Pay Vendor interface. The main window shows the 'Post Outgoing Payments: Header Data' screen. The 'Document Date' is '05/04/2021' and the 'Posting Date' is '05/04/2021'. The 'Document Number' is '1500000001' and the 'Reference' is '1500000001'. The 'Doc. Header Text' is '1500000001' and the 'Clearing Text' is '1500000001'. The 'Bank data' section shows 'Account: 1500000001' and 'Business Area: 1500000001'. The 'Amount' is '6.00' and the 'Bank Charges' are '0.00'. The 'Value date' is '05/04/2021' and the 'Text' is '1500000001'. The 'Company Code' is 'PH01' and the 'Currency' is 'PHP'. The 'Transaction date' is '05/04/2021' and the 'Cross-CC Number' is '1500000001'. The 'Trading part BA' is '1500000001' and the 'Assignment' is '1500000001'. The 'Profit Center' is '1500000001' and the 'Additional applications' are '1500000001'.

Figure 10. Pay Vendor

Figure 10 shows the section where they make the post outgoing payments.

Table 1. Sample

Attribute	Net Price	Data Value
AUPT10## Automotive Paints	1,250	PHP
THNN10## Thinners	450	PHP
SPPR10## Sand Papers	550	PHP
MSTP10## Masking Tape	1,450	PHP
RBCM10## Rubbing Compound	2,850	PHP
HOPN10## House Paint	1,650	PHP
INPN10## Industrial Paint	2,050	PHP

Table 1 shows the sample table of the materials wherein it shows its code and total price of the materials.

House paint - Ajaycee Chemicals

0010000021 Purchase Requisition Number

4500000056 Standard Purchase Order

5000000070 Material Document

5105600154 Document number (Invoice)

1500000001 post outgoing payment

4.3 Comparison of Improvement (As-is vs To-be)

Comparing the flow process charts of the As-is and the To-be processes, we can see a significant change in not only one aspect. In the As-is flow process, there is a significant amount of time wasted compared to the to-be process. The as is process shows that the current process took more time from processes like inspections and most processes were manually carried out. Due to the manual operations of the as is process chart, the process chart reported a total lead time of about 245 minutes. The products being delayed is not only because of making and preparing the orders manually but also because of human error. It would be better if the owners do some training for the users of ERP system. There has been a big improvement in the overall lead time and in certain processes for the to-be process. There has been an implementation of a centralized system and since methods have been improved, more time has been maximized without wasting too many resources. For a total lead time of about 83 minutes only; a difference of 162. The to-be process is as efficient as possible with a more centralized and organized approach. And also, the purpose of this system is not only to reduce the time spent in the processing of materials but also to generate more revenue.

Reports provided by ERP(S4Hana)

Figure 11 displays the quantity and total number of orders per supplier. It allows the purchasing manager to view the purchasing documents created for each vendor.

PO	Type	Supplier	Name	Short Text	Mat. Group	PgP Order Date
Item	Material	Order Qty	Un	Net Price	Curr.	per Un
D I A Pint Sloc						
4500000057 NB	125092	21	Slimtex Industries Inc	M21 05/05/2021		
00020 THNN1021			21 Thinners	SFTY		
ML21 TG21	10	EA	450.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%
00050 RBCM1021			21 Rubbing Compound	SFTY		
ML21 TG21	10	EA	2,850.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%

PO	Type	Supplier	Name	Short Text	Mat. Group	PgP Order Date
Item	Material	Order Qty	Un	Net Price	Curr.	per Un
D I A Pint Sloc						
4500000007 NB	125088	21	Ajaycee Chemicals	M21 04/08/2021		
00060 HOPN1021			21 House Paint	SFTY		
ML21 TG21	50	EA	1,650.00	PHP	1	EA
Still to be delivered	50	EA	82,500.00	PHP	100.00	%
Still to be invoiced	50	EA	82,500.00	PHP	100.00	%
4500000056 NB	125088	21	Ajaycee Chemicals	M21 05/04/2021		
00060 HOPN1021			21 House Paint	SFTY		
ML21 TG21	10	EA	1,650.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%

PO	Type	Supplier	Name	Short Text	Mat. Group	PgP Order Date
Item	Material	Order Qty	Un	Net Price	Curr.	per Un
D I A Pint Sloc						
4500000026 NB	125089	21	Ranuda Industries	M21 04/22/2021		
00030 SPPR1021			21 Sand Papers	SFTY		
ML21 TG21	50	EA	550.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%
00040 MSTP1021			21 Masking Tape	SFTY		
ML21 TG21	50	EA	1,450.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%

PO	Type	Supplier	Name	Short Text	Mat. Group	PgP Order Date
Item	Material	Order Qty	Un	Net Price	Curr.	per Un
D I A Pint Sloc						
Still to be invoiced	50	EA	102,500.00	PHP	100.00	%
4500000058 NB	125091	21	Thainakorn Paint	M21 05/05/2021		
00010 AUPT1021			21 Automotive Paints	SFTY		
ML21 TG21	10	EA	1,250.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%
00070 INPN1021			21 Industrial Paint	SFTY		
ML21 TG21	10	EA	2,050.00	PHP	1	EA
Still to be delivered	0	EA	0.00	PHP	0.00	%
Still to be invoiced	0	EA	0.00	PHP	0.00	%

Figure 11. Purchasing documents per supplier

Figure 12 displays the stock overview of the organization. This is like inventory management to meet the customers' needs for the availability of their orders.

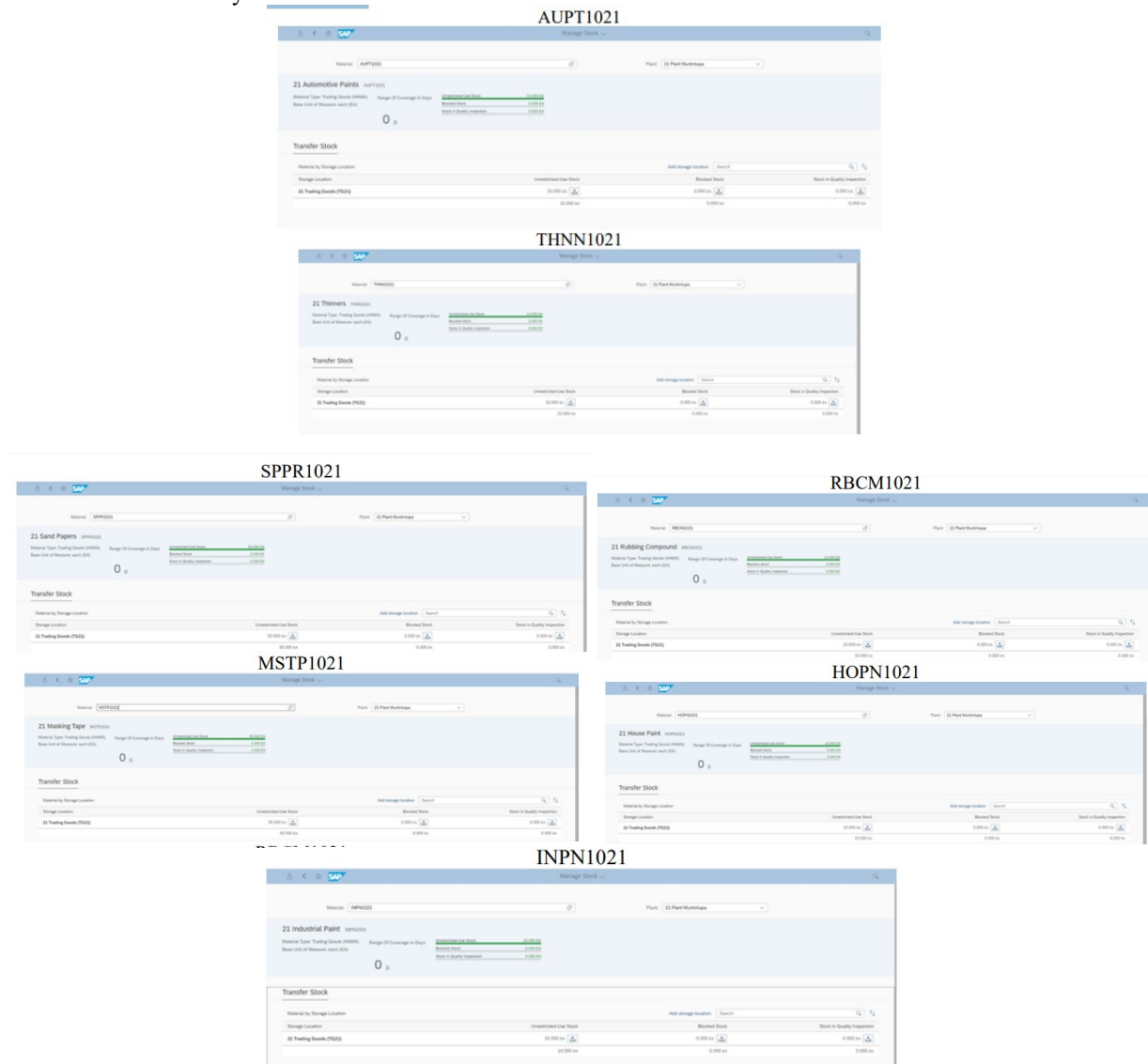


Figure 12. Stock overview of each materials

Figure 13 displays an overview of the items ordered in the purchasing documents for each vendor.

My Purchasing Document Items							
Doc	Doc Type	Material	Quantity	Order Value	Invoice Quantity	Invoice Value	Relevance
20	Purchase Requisition	21 Automotive Paints	Ordered 10 EA	28,500.00 PHP	10 EA	28,500.00 PHP	Completed
20	Purchase Requisition	21 Thinners	Ordered 10 EA	4,500.00 PHP	10 EA	4,500.00 PHP	Completed
20	Purchase Requisition	21 Sand Papers	Ordered 10 EA	21,500.00 PHP	10 EA	21,500.00 PHP	Completed
20	Purchase Requisition	21 Masking Tape	Ordered 10 EA	71,500.00 PHP	10 EA	71,500.00 PHP	Completed
20	Purchase Requisition	21 Industrial Paint	Ordered 10 EA	20,500.00 PHP	10 EA	20,500.00 PHP	Completed
20	Purchase Requisition	21 Rubbing Compound	Ordered 10 EA	28,500.00 PHP	10 EA	28,500.00 PHP	Completed

Figure 13. My Purchasing Document Items

Figure 14 shows the viewer the movement of the goods, such as its purchase order, material document, and accounting document

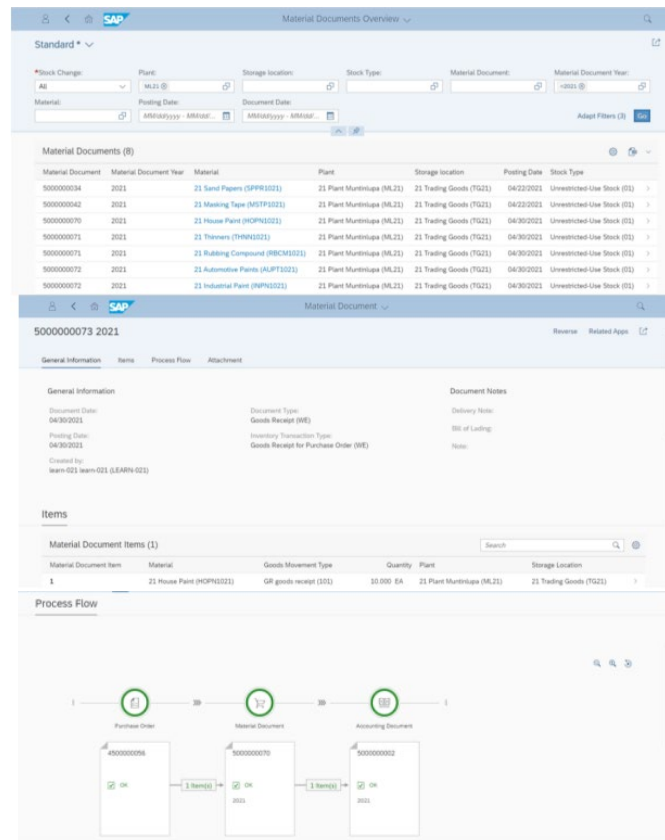


Figure 14. Material Document Overview

Figure 15 displays the amount being spent together with its posting date 100000 Bank account

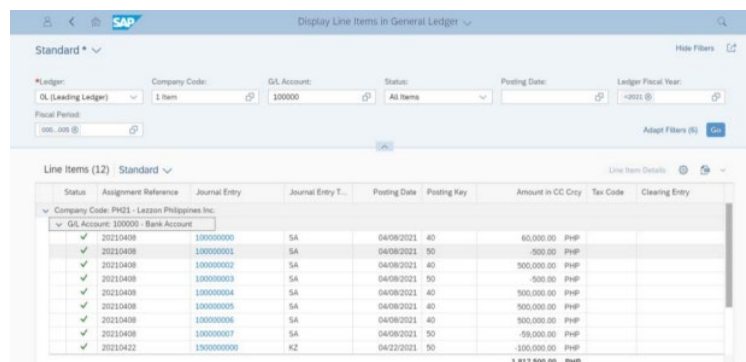


Figure 15. Display Line items in the ledger

Figure 16 shows the Supplier Balances wherein the user can view debits, credits, and balances by company code, suppliers, and fiscal year.

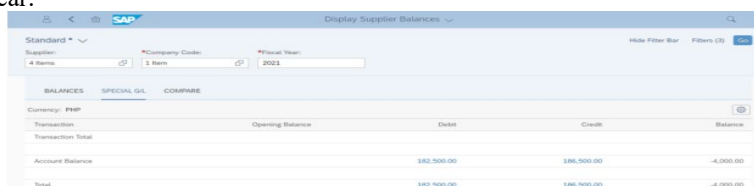


Figure 16. Supplier Balances

4.4 Advantages of ERP

ERP is a system that manages and ensures the security of the data and information of the business. One of its advantages is the communication that it can provide for the entire processes of the organization. Also, using the functions that an ERP has can produce greater solutions that can fix problems that the organization has been encountering in their business. Communication must always be definite and accurate because it is how the organization and clients can understand their misunderstandings and think of variations of ways to sort it all out. Another advantage is the feature of an ERP called Real time operations wherein it generates or displays real time information regarding the stocks or goods of their suppliers which can be a beneficial aspect of an organization (Epicor, 2020). This certain feature can help with the idea of the time management and data management of the business because it can gather information regarding their needs and products and update the organization with regards to the information needed for the success of the processes within the business. Also, one of an ERP advantage that are definite for an organization is its storage feature wherein it can store critical and much needed information and with that it can be accessed easily for the organization so that once they ran out of ideas or information which in fact can turn into a solution it would be easier for them to gather such information within the organization (Perkins, 2020). Reliable information can be also accessed within the organization (Wedell, 2020). It can display variations of information within the business departments, which can really be a great solution for communication and time management not only for the business but also for the organization itself. (Saudi ERP & Website Solution Blog, 2020)

5. Conclusion

Lezzon Philippines Paint and Chemicals Co. has been encountering problems lately that are focused on its processes; one of the objectives that are settled for the company's specific needs is to incorporate an ERP system to improve the company's overall process. The company lacks systems needed for the purchasing department, manually recording orders and gathering information through phone and email. With an ERP system it can improve the processes within the purchasing department to further improve its capabilities to be more productive because an ERP system can provide tasks that may be difficult for a man to accomplish. The as-is processes consume a lot of time which can affect production time because it takes time waiting for deliveries and stocks because of their uncertainty on the quantity of their orders, and on the other hand, the to-be processes would focus more on the productivity of the company with the appropriate systems specifically the ERP system used on the purchasing department. Because it can provide access. The root-cause analysis determines the dilemma that affects the productivity that has been happening in the department. It discusses the setbacks that have been the cause of their problem; this certain approach can benefit the company because they can settle for an appropriate approach and implement an ERP system.

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