



Standard Time of Import Paperwork Clearance Department for Sustainability Organization Performance in Forwarding Company

Nor 'Adilah Mohamad Raazali, Roslina Mohammad*, Norazli Othman and Zuritah A.Kadir

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, 54100, Jalan Sultan Yahya Petra, Kuala Lumpur

Received: 29/10/2019

Accepted: 29/01/2020

Published: 20/02/2020

Abstract

In order to achieve sustainable performance, it was emphasized for an organization for improvement of the standard performance. This paper attempts to propose a benchmark for the standard time to complete daily paperwork received at a forwarding company by using the define-measure-analyse-improve-control (DMAIC) approach. Results showed that the import clearance agent required 3 days or more to clear paperwork for duty or tax confirmation. The impact led to delayed shipment delivery, caused by customer dissatisfaction and company loss of trusts amongst customers. It was also found that the number of paperwork received daily was 516, distributed among an average of 15 employees, from January to April 2018. Each employee received an average of 34 paperwork daily. The amount of paperwork received by each employee was at alarming level. The time required to complete paperwork for duty/tax confirmation were 3 days or more for most of the employees, which stood at 62%. Therefore, based on the results of the findings, the proposed benchmark of the standard time for paperwork clearance should not be more than 1 day to allow for same day delivery to the customers, as per the commitment promised by the company.

Keywords: DMAIC, Performance, delay, Standard Time, Sustainability

1 Introduction

Under United Nation Sustainability Goal Development number nine [1], "Industry, Innovation and Infrastructure", there have been reported that efficient transportation services are key drivers of economic development, and more than 80 per cent of world merchandise trade by volume is transported by sea, making maritime transport a critical enabler of trade and globalization. It was reported that International maritime freight increased by an estimated 3.7 per cent globally in 2017 and projected growth will test the capacity of existing maritime transport infrastructure to support increased freight volumes.

As part of transportation and supply chain industry, the operation of a freight forwarding company highly relies on smooth pre-clearance processes to ensure its efficiency and functionality of the business. Figure 1 shows the general operation of activities of a freight forwarding company. Freight forwarding companies move shipments, from documents to high value items of any sizes, up to tonnes of weights, to and from various locations around the world. There are two movements related to shipments; physical packages and paperwork. The red boxes show the physical movement of the shipments, while the blue boxes show the paperwork movement.

It starts with the customer calling in to arrange for the pickup of a shipment. The couriers pick up the shipment to the station, to be consolidated with other shipments, and later loaded onto flights. During the transit, the originator completes the outbound declaration, and the inbound clearance begins at the destination. Once the items arrive at the station and are scanned into the system, they will be manifested for declaration purposes. All paperwork received are prepared for declaration and declared via an online system to Customs. When the flight arrives at the destination country, the shipments will complete inbound sorting and the delivery is moved across delivery stations. All shipments are pre-cleared, except for those missing paperwork, duty and tax required confirmation, held for inspection, quarantine and etc., which will be delivered on the same day.

For shipments which are not cleared, the consignees will be contacted and informed on the clearance delay regarding their shipments. Once the information is received, only then are the shipments continued for declaration, and proceed for the next day delivery. It is very important that import clearance is completed before shipments arrive to ensure timely delivery. Import declaration process flows depend on the shipment's categories. Figure 2 shows the import declaration process flow of a freight forwarding company.

Corresponding author: Roslina Mohammad, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, 54100, Jalan Sultan Yahya Petra, Kuala Lumpur. Email: mroslina.kl@utm.my.

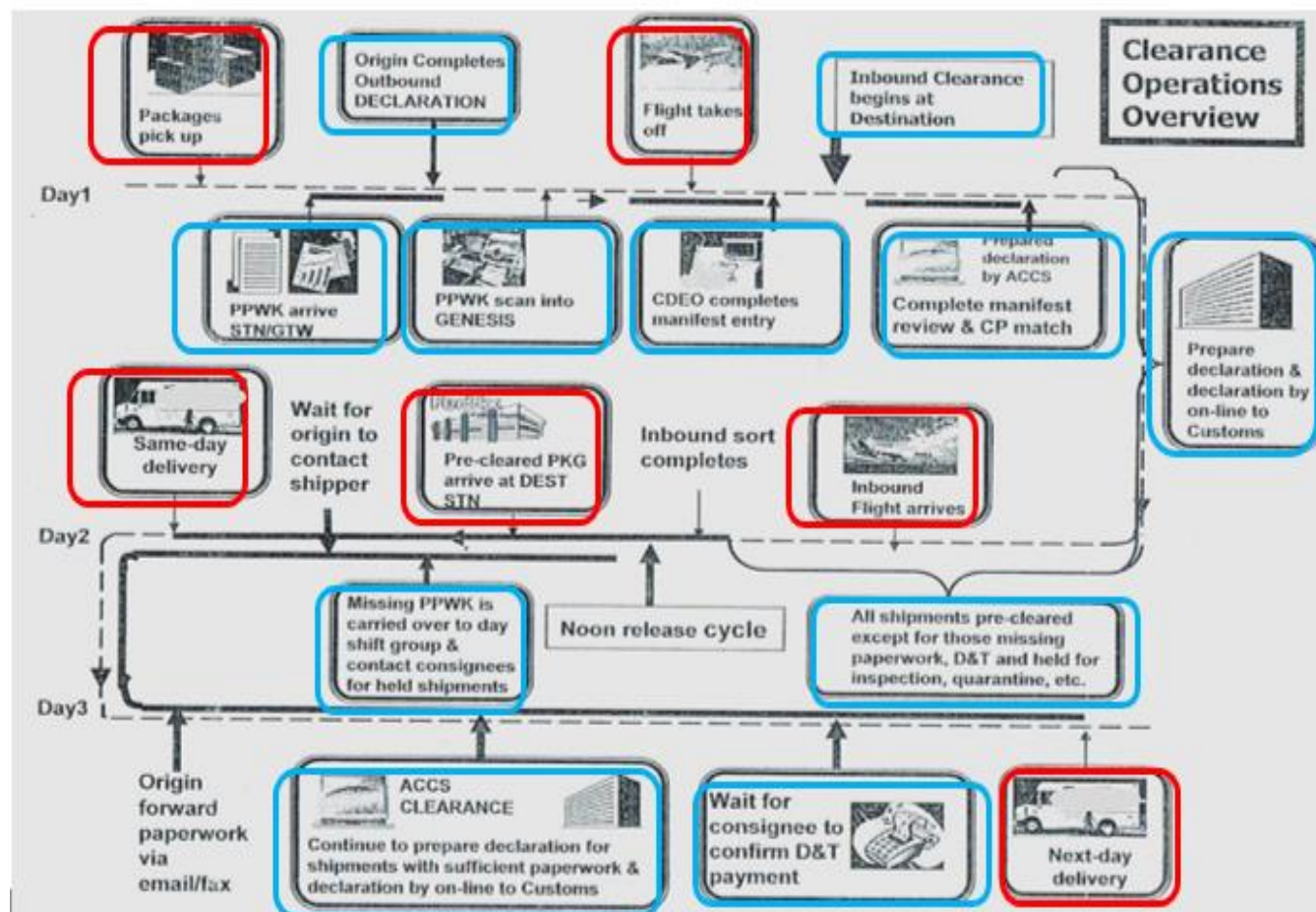


Figure 1: General operation activities of a freight forwarders company

The shipments can be categorized into document, non-document (below RM500), non-dutiable non-document (RM501-2000), non-dutiable non-document (above RM2000), dutiable non-document (above RM500) and non-document (bonded, C8) shipments. The paperwork for shipments under the categories document, non-document (below RM500) and non-dutiable non-document (RM501-2000) will be printed from the APAC Core Clearance System (ACCS) before being submitted for manifest and declaration process termination. The paperwork for shipments under the categories of non-dutiable, non-document (above RM2000), dutiable non-document (above RM500) and non-document (bonded, C8) will go through formal submission. The airwaybill (AWB) and commercial invoice (CI) for these shipments will be printed out and matched before being declared in the ACCS. Once declared, the information will be downloaded in the Custom Information System (Sistem Maklumat Kastam – SMK). Later, the Custom form (C1 or C8) will be printed out and submitted to Customs. Once cleared, the ACCS will be selected and the code updated for the process to end. Figure 3 shows the pre-clearance process flow for dutiable and non-dutiable non-document shipments. The paperwork will be retrieved from the ACCS, an application for stat 80 (document ready for declaration) is submitted, based on the declaration categories of either C1 or C8. For C8 shipments, once declared in

the SMK, the paperwork is submitted for an E-Declaration Information (EDI), where the Custom forms are printed for Customs assessment.

For C1 shipments, once the information is sufficient for declaration, it will be declared in the ACCS, and submitted for EDI. The Custom forms are printed to apply stat 76 (paperwork submitted for clearance) and brought for Customs assessment. If the paperwork is cleared for Customs with duty, it will go through duty confirmation processes, otherwise, it will proceed with printing of the Customs Official Receipt (COR), insertion into pouches, and application for stat 65 (shipment release).

However, if the paperwork receives Customs instructions for examination (sample), other government agencies (OGA), balance sheet, physical examination and confirmation, it will require further clearance processes. All of these requirements will be updated using the related scan codes, where the paperwork will be handed over to CPE (Clearance, Prevent, and Expedite) agents to notify the recipients on the clearance delay.

Nevertheless, there were also cases where paperwork is not available in the ACCS or is missing. In such cases, the paperwork is retrieved from the physical packages once the shipments arrive at the destination station. Figure 4 shows the pull paperwork declaration process flow. Basically, the process is almost the same as the pre-clearance process flow. The exception is that the

paperwork is retrieved from the physical packages and passed on to the Declaration team manually for declaration purposes. If the paperwork is not available with the packages, the clearance agent

will print out the AWB number from the E-Operations (E-OPS) system and pass it to the CPE agent to notify the recipients on the clearance delay.

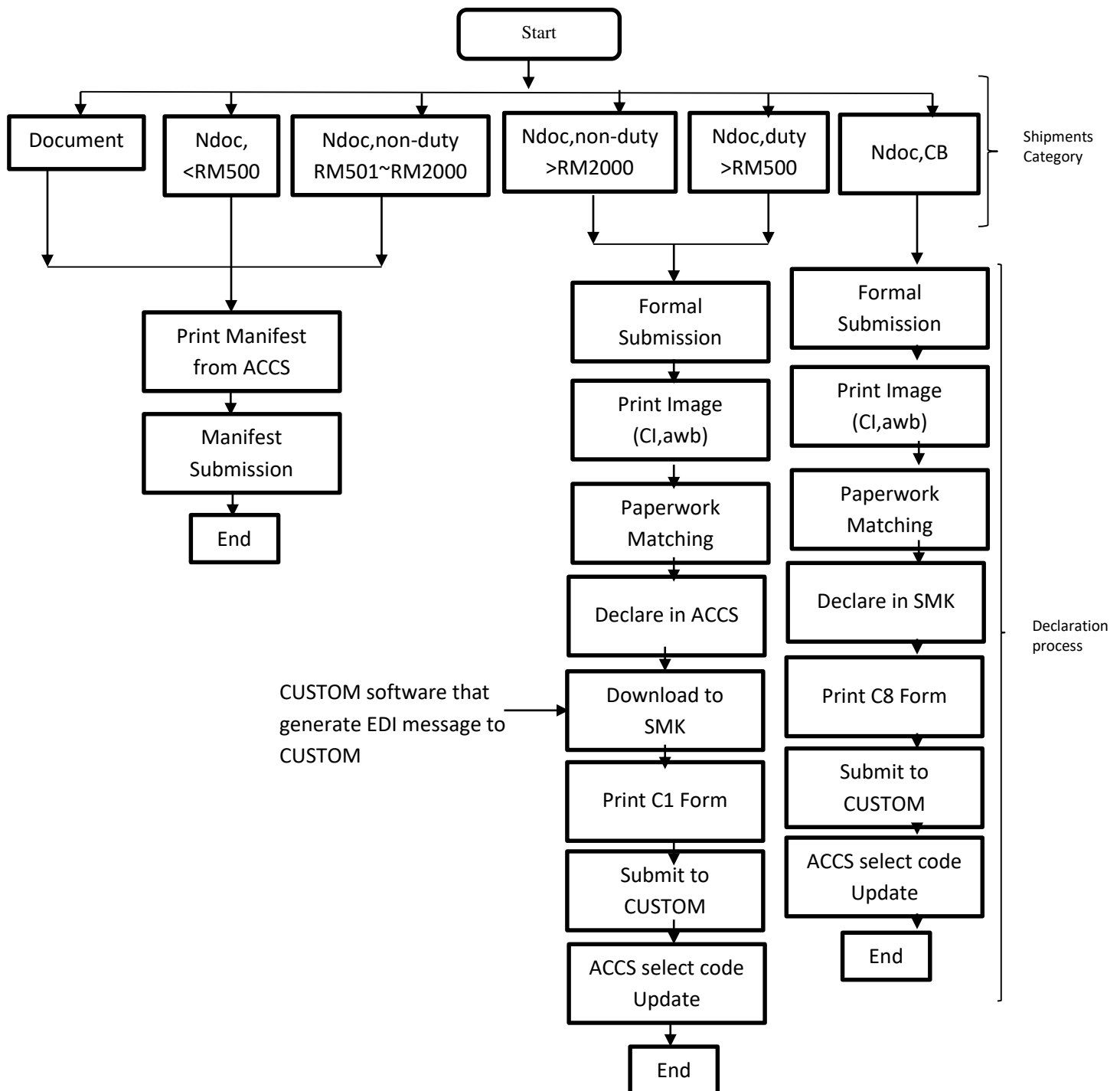


Figure 2: Import Declaration Process Flow

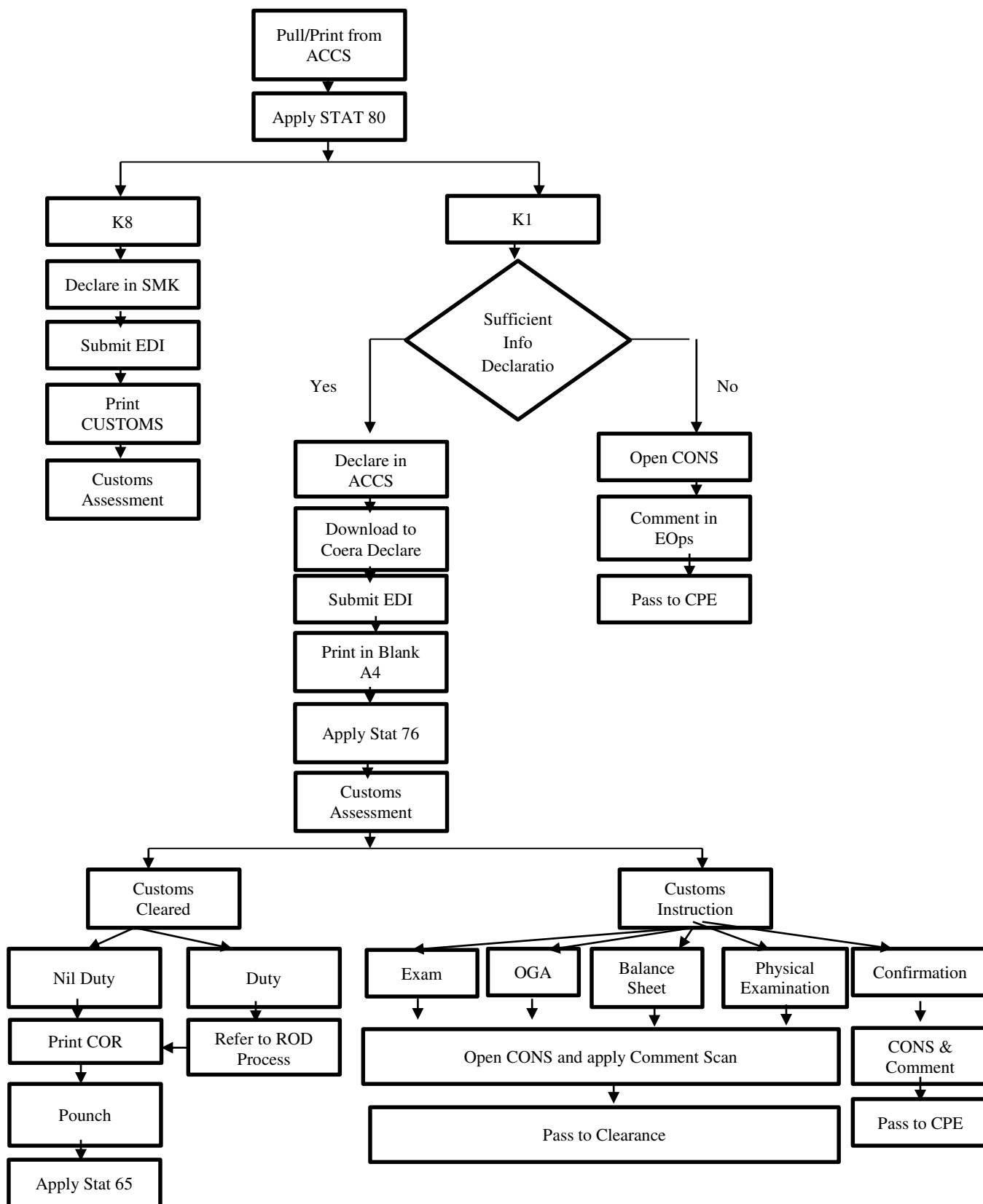


Figure 3: Pre-clearance Process Flow

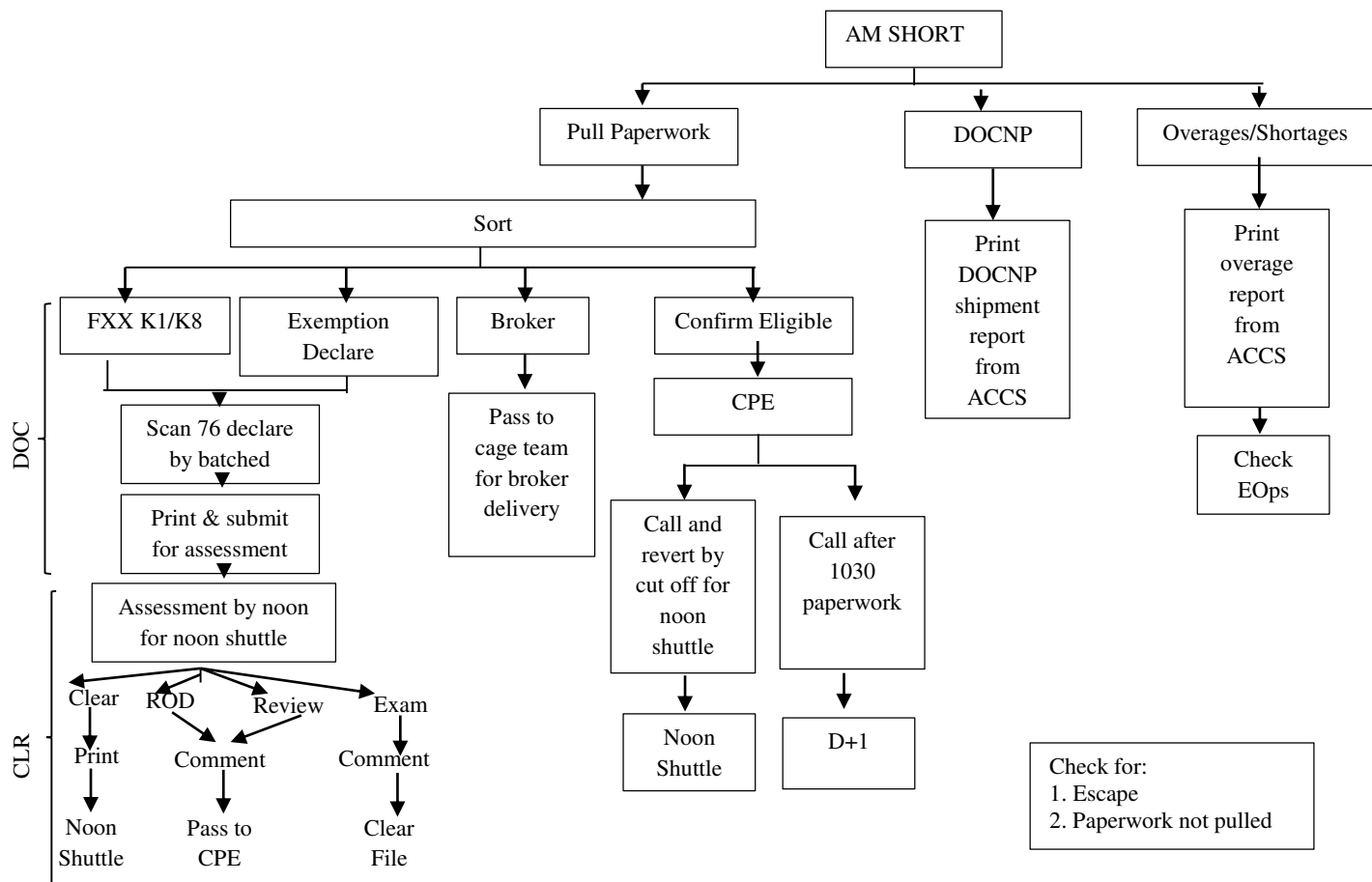


Figure 4 : Pull Paperwork Declaration Process Flow

A standard time for an employee to complete the daily paperwork received helps to ensure that the employees are on track with their daily productivity. However, if the employees receive too much paperwork, they may lose track of time. The CPE agent's job scope involves handling paperwork and being directly in contact with customers, either via emails, calls or faxes. If there is insufficient manpower in the Import Clearance team, CPE will be impacted severely, thus, this affects the business operations shipments will be delayed due to clearance issues.

Figure 5 shows the CPE workflow process. It starts from the point at which the night CPE agents receive the paperwork from the Declaration team. They will filter the paperwork, which can be submitted for clearance. The remaining paperwork will be segregated almost equally to the available CPE agents. The notification is done while segregating the paperwork at night, up to 8.00 am the next day. This is to ensure that the customers receive it at the start of the working period. When the CPE agents begin their shifts, some customers may already have provided the necessary updates and paperwork, which can be submitted for declaration.

Nevertheless, the CPE agents must contact customers and obtain updates from the customers latest by 10.30 pm, to ensure sufficient time is available for the Declaration team to declare the paperwork, to ensure same day delivery can be performed across the delivery areas. Sometimes, customers are unable to be

contacted on the same day, thus the agents need to keep contacting them until an update is received. After 5 working days, and if no update is available, either the paperwork will be abandoned, or the shipments will be returned to the shipper at their own expense.

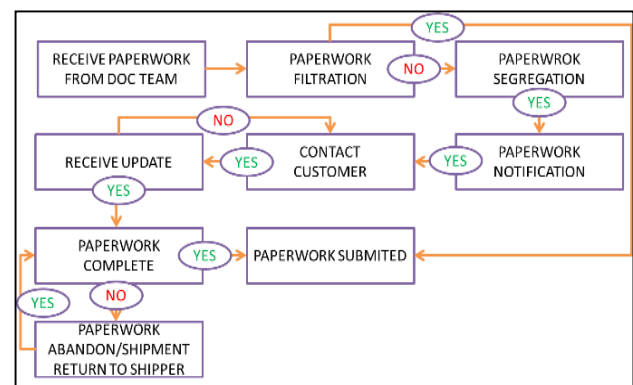


Figure 5: CPE Workflow Process

Table 1 shows the average daily productivity. For the total working days between 18 and 27 working days, an average between 14 to 17 employees are available daily to handle the total paperwork, for as many as 7000 to 12000 per month, as shown in

Figure 6. As the amount of paperwork received increased from January to March and remained relatively high until June. Therefore, it is crucial to identify if the current standard for the employees to complete their daily paperwork is optimum to manage this volume. Otherwise, the company will need to take corrective measures to avoid an unnecessary impact to the business operations.

Table 1: Average Daily Productivity

Month	Total Paperwork	Total Working Days	Average Daily Manpower	Average Daily Productivity
JAN	7150	18	16	25
FEB	9572	24	16	25
MAR	11903	27	16	28
APR	11598	25	17	28
MAY	11868	27	16	27
JUN	11410	25	14	32

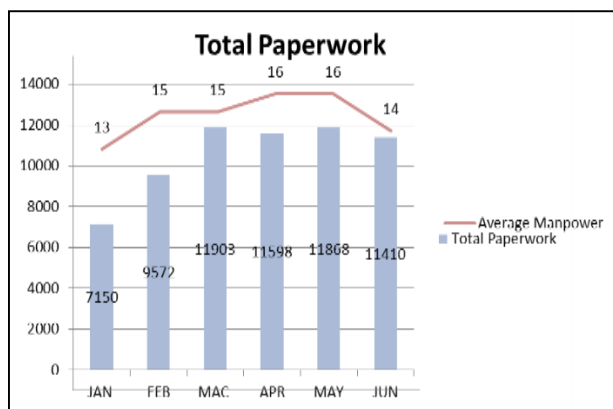


Figure 6: Total Paperwork & Average Manpower of CPE (January-June 2017)

This research determined if the current employees were able to complete the daily paperwork clearance and investigate if there were any requirements for an extra number addition to the workforce. Wastages, such as staff waiting for instructions, materials waiting for processes, labour waiting for tools, defective raw materials, processes without defined standard times, etc., are everywhere. Regardless of the risks of the encounter, businesses should strive to remain updated with the current methodologies, and technological developments. Therefore, it is very important for the companies to look for innovative approaches to improve and optimize their processes to compete successfully globally, in order to remain competitive [2, 3]. In manufacturing, cycle time is defined as the complete period required in one operation cycle to complete a job, task or function, from start to finish, or the total time required to produce a product. One of the key measurement tools used to evaluate the performance of leading-edge management concepts such as supply chain management, lean management, just-in-time management, and enterprise resource planning. Operational excellence programs also address the variability in cycle times, raw materials, process operations and product or service quality [4]. Many companies have seen that increased costs and cycle times lead to ineffectiveness to achieve the company's goals due to inefficient operational business processes, of which the cycle time where the resource areas is measured include the

measurement of financial, information and material flows. As reducing cycle time allows quicker feedback to customers, any delay or failure leads to the failure of the entire business process. Thus, it is important that cycle time in areas such as sales and marketing, compliance, product development and quality, is improved to reduce cost and inventories, hence, increasing capacity.

An inefficient customs clearance process can hinder trade, therefore, a smooth and efficient customs clearance process is very crucial to facilitate an international trade of goods [4]. A report (Figure 7) from the World Trade Organization (WTO) in the World Trade Statistics Review 2019[5], showed that the global manufactured export goods increased from USD 8 trillion to USD 11 trillion over a period of 10 years, between 2006 and 2016. Agricultural products increased by an average of 5% per year, and fuels and mining products declined by 10%, since 2006. However, there have bit a little bit slump in year 2017 onwards. Trade growth in 2018 was weighed down by several factors, including new tariffs and retaliatory measures affecting widely-traded goods, weaker global economic growth, volatility in financial markets and tighter monetary conditions in developed countries, among others. Consensus estimates have world GDP growth slowing from 2.9% in 2018 to 2.6% in both 2019 and 2020.

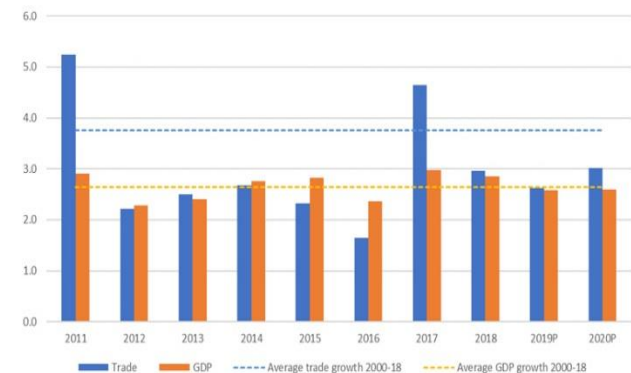


Figure 7: GDP is measured at market exchange rates. Data for 2019 and 2020 are projections

The report shows the importance of efficient customs clearances for international trade, of which has crucial for many countries, other than depending on accelerating the integration pace within the global trading system. Author [6] also mentioned that the manufacturers face difficulties to export competitively, or import at a competitive cost, due to inefficient customs clearance processes or bad dysfunctionalities, which leads to additional costs, as the trade procedures applicable to goods entering ports are costly and time-consuming. The report also analyses that fact that improved trade-related customs services can positively facilitate international trade due to customs clearance efficiencies.

The issues that caused time delays at customs include, but are not limited to the lack of reliability and transparency during inspection and valuation, lack of customs officers, and their working hour limitations, long and complex process of customs clearance, shortage of receiving cargo gates and non-automated procedures and administration of customs processes[4]. To reduce the competition for similar domestic products, some countries are reported to have intentionally delayed their customs

clearance, as it will increase transaction costs, especially at the border, where it affects perishable products such as agricultural products.

The product prices will be impaired due to reduced product quality, thus, giving local products higher prices, as their product quality is better than imported ones. This issue has caused global manufactures to be highly dependent on frequent and timely delivery of raw materials in order to reduce transportation costs and delivery time. This issue is called “quality effect” where the product quality severely deteriorates due to time delays during customs clearance. It later leads to the “price effect” as the selling price is reduced due to lower product quality. Both consumers and producers are at a loss and affected by inefficient customs clearance.

Nevertheless, the characteristics of product trade also determines the magnitude of the effects. As an example, quality losses, increased storage and treatment costs, as well as loss of weight and volume may be applicable to perishable products. However, for products such as newspaper and magazines, this can lead to total loss, due to their nature, which needs to be consumed in a limited time window. The customs clearance delays may not affect time-sensitive products, but it will still affect the producers if the consumers change their preferences to choose local products which have similar characteristics to their products, with a lower price.

Most research in the pasts investigated the demand of timeliness and its effects on international trade, where products that are time-sensitive are imported between nearby countries due to high transportation costs. In their research, [7] investigated the time delay’s quality and price effect on the agricultural products due to highly perishable, and short shelf-life, as the quality and selling price could be reduced caused by time delays. It was found

that highly perishable products are highly affected by time delays that are caused by significant drop in the quality and selling price. For a medium perishable product, they found that the quality is affected significantly, as the time delay reduced the product quality, but do not too much to the point that could reduce the selling price. For less perishable products, either the quality effect or the price effect is significant due to less time sensitive characteristics. It was also found that if a country reduces the time delays to half, the import of highly perishable products can increase by around 35%, where medium perishable products can increase by 15%, which led to significant increase of trade and social welfare benefits for both importing and exporting countries. It was suggested that time delays at the border need to focus on other than trade policy reforms and on traditional measures, such as tariffs, by accelerating customs clearance procedures. This enables the countries to promote time-sensitive products and stimulate international trade transaction volumes, as well as provide higher quality products to consumers and exporters, who benefit through higher selling price. Most of the time, traders suffer the most due to loss of profit, delayed delivery, loss of business and increased direct and indirect trade transaction costs.

One of the best achievable practices and processes is benchmarking [6]. Benchmarking standards assists in selecting suitable systems to be applied. Gijo & Scaria (2014)[8] found that process capability-related problems are reduced and improved through the first pass yield with the implementation of Six Sigma DMAIC methods. Benchmarking allows the organizations to monitor the business processes, if they are on par with other industries.

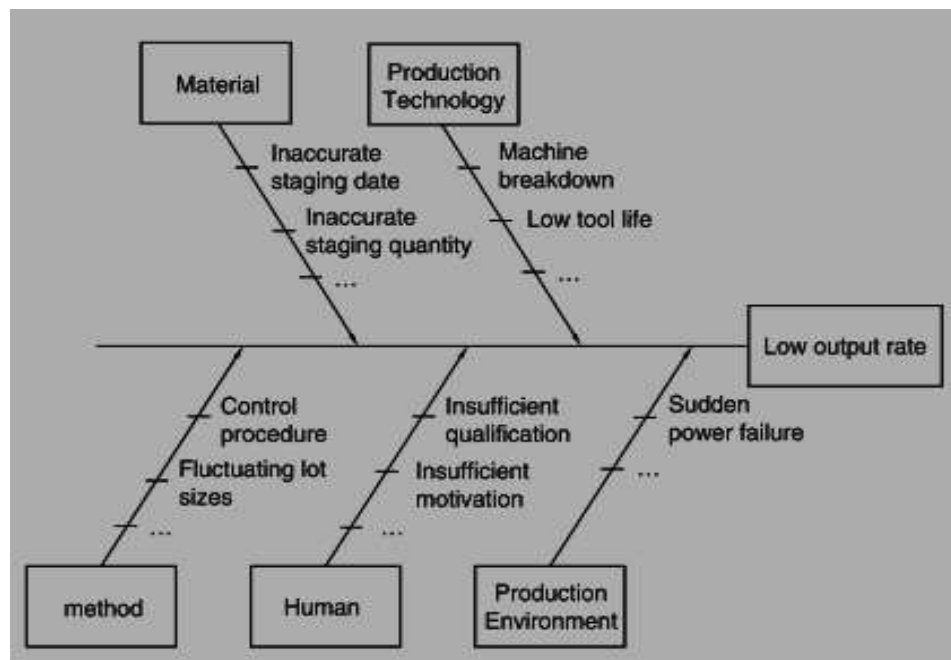


Figure 8: Ishikawa Diagram of Logistics Risk

In terms of problem solving, there will be many opinions which need to be captured in order to determine the root cause. These ideas can be visualized into a cause and effect diagram, which is also known as a fishbone or Ishikawa diagram. It leads to more robust solutions, as it helps to explore thoroughly the issues behind these problems. Author [9] identified and systematically depicted the correlations between causes and the logistics risks using the Ishikawa diagram, as shown in Figure 8, which listed five main possible causes; materials, machine, manpower, method and environment.

This study used the Ishikawa diagram to identify the causes that affected the paperwork clearance delay. Once the causes were identified, the possible solutions were proposed to improve the performance of the clearance department. Removing wastes and unnecessary steps from the processes were the main focus of the lean quality management, where it created a standardized and stable process to achieve the best quality services by doing the right things first [9]. The 3Ms of lean are Muda (wastes), Muri (overburden) and Mura (unevenness), which will be identified in this study, as it affects the cycle time of the paperwork clearance. By removing the non-value-added activities in the paperwork clearance, the process can be standardized and allows for the efficient business operation of the company.

2 Methodology

This research used the define-measure-analyze-improve-control (DMAIC) approach, which was adopted for improving the process capability of the Import Clearance Department. Process control plays an important role, regardless of the quality inspection in order to obtain an improved end product, or service quality. DMAIC consists of a systematic procedure which aims to achieve sustainable improvements in business processes, and ultimately in the end products or services [10, 11]. Several researchers used DMAIC approaches in their researches in an effort for improving process capability, such as [12] and [13],[14] and [9].

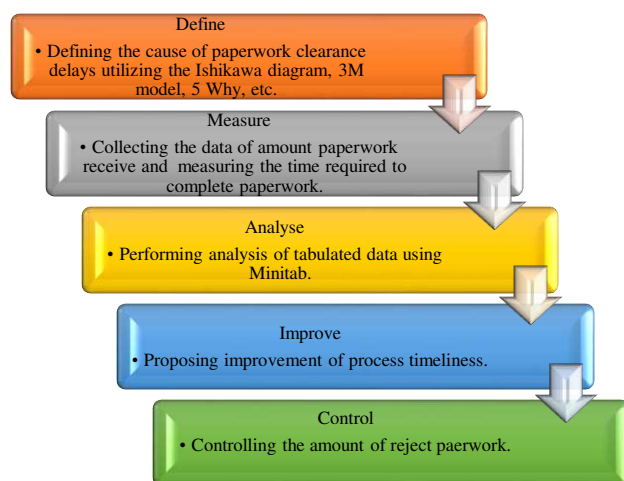


Figure 9: Operational Framework

The DMAIC procedure has been adopted worldwide to improve operation process flows and to reduce rejection by employing quality control tools [15-17]. Ismail et al., (2014) applied DMAIC in their study to determine wastage and to reduce

cycle time production, where 54% of the overall production cycle was considered as waste and non-value added [4]. This study applied the DMAIC method in order to manage waste and variability that caused paperwork clearance delays. Figure 9 describes further the framework for the research according to the sequence of work to be accomplished.

2.1 Define phase

The Define phase in this study identified the cause of the clearance delays using the Ishikawa Diagram as shown in Figure 10. The four main areas include man, machine, method and materials.

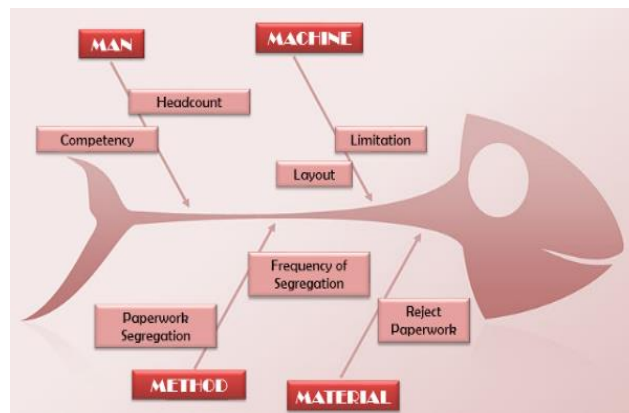


Figure 10: Ishikawa Diagram – Cause & Effect of Paperwork Clearance Delay

The 3M model incorporated the value stream mapping (VSM) to identify the wastes in the Import Clearance team. Steps for VSM for non-manufacturing processes are shown in Figure 11. By using the 3M model & VSM, office wastes was identified, which included: (a) long lead times; (b) work queues; (c) excess paperwork and redundant approvals; (d) incomplete and inaccurate information; and (e) complex tracking procedures.

2.2 Measure phase

In the measure phase, the data of the amount of paperwork received was collected and the time required to complete the paperwork clearance was measured. The data was tabulated for the analysis as shown in Table 2 and was later consolidated into Table 3.

2.3 Analyse phase

In analyse phase, analysis was performed, and data was tabulated using the Minitab software to identify the actual time used by the CPE agents to clear paperwork. All factors that contributed to clearance delay within the department were identified for rectifications and further improvement.

2.4 Improvement & Control phase

In the improvement phase, the solutions for the root causes of clearance delays were proposed. The quality improvement objective was to reduce the clearance delay by standardizing the time require to complete paperwork, thus improving process and service performance. Last but not least, the control phase which controlled the amount of rejected paperwork, and as the result of this study, where a proper documentation of the SOP was

recommended by implementing the lean concept. The associated causes of the clearance delay and corrective action was produced. Hence, the standard time benchmarking could be revised from time to time according to the current business operation by

monitoring the critical process parameters, maintaining documentation and updating information.

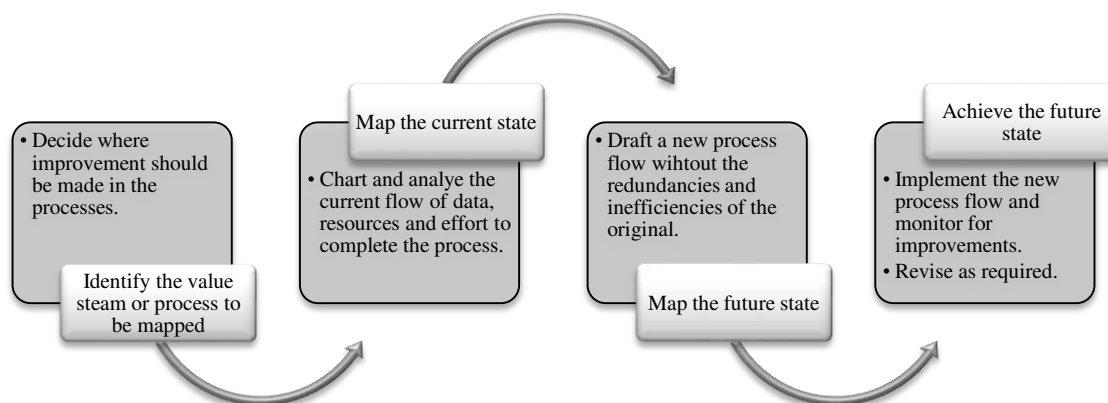


Figure 11: VSM steps for non-manufacturing processes

Table 2: Paperwork Segregation

JAN	Date	01/01/18	04/01/18	15/01/18	18/01/18	19/01/18	20/01/18	25/01/18	26/01/18	27/01/18	28/01/18	31/01/18	0	Total Day
	Paperwork												0	Total ppwk
	Manpower												0	Ave manpower
FEB	Date	01/02/18	04/02/18	15/02/18	18/02/18	19/02/18	20/02/18	25/02/18	26/02/18	27/02/18	28/02/18		0	Total Day
	Paperwork												0	Total ppwk
	Manpower												0	Ave manpower
MAC	Date	01/03/18	04/03/18	15/03/18	18/03/18	19/03/18	20/03/18	25/03/18	26/03/18	27/03/18	28/03/18	31/03/18	0	Total Day
	Paperwork												0	Total ppwk
	Manpower												0	Ave manpower

Table 3: Average Daily Productivity

Month	Total Paperwork	Total Working Days	Average Daily Manpower	Average Daily Productivity
JAN				
FEB				
MAR				

3 Results and Discussion

3.1 Number of paperwork received monthly

Table 4 shows the number of paperwork received by CPE agents from January to April 2018. The number of paperwork in January and February 2018 decreased from 11974 to 11486 due to less incoming volumes after New Year 2018 and Chinese New Year. Plus, there were quite a number of public holidays between January and February, with most of them involving long weekends. In March 2018, the volume spiked to 15453 as most companies continued their operations after several weekend holidays, but decreased to 13642 in April 2018.

Table 4: Total Paperwork Jan – Apr 2018

Month	Jan-18	Feb-18	Mar-18	Apr-18
Amount of paperwork	11974	11486	15453	13642

The actual numbers of staff available who actively carried out paperwork clearance was 17. However, only an average of 14 people were available in January and April 2018, and 16 people in February and March 2018, as shown in Figure 12. Fewer number of employees in January was due to the fact that 2 employees were still under maternity leave, and only came back in February 2018. However, in March 2018, the number of employees decreased again due to staff resignation and termination.

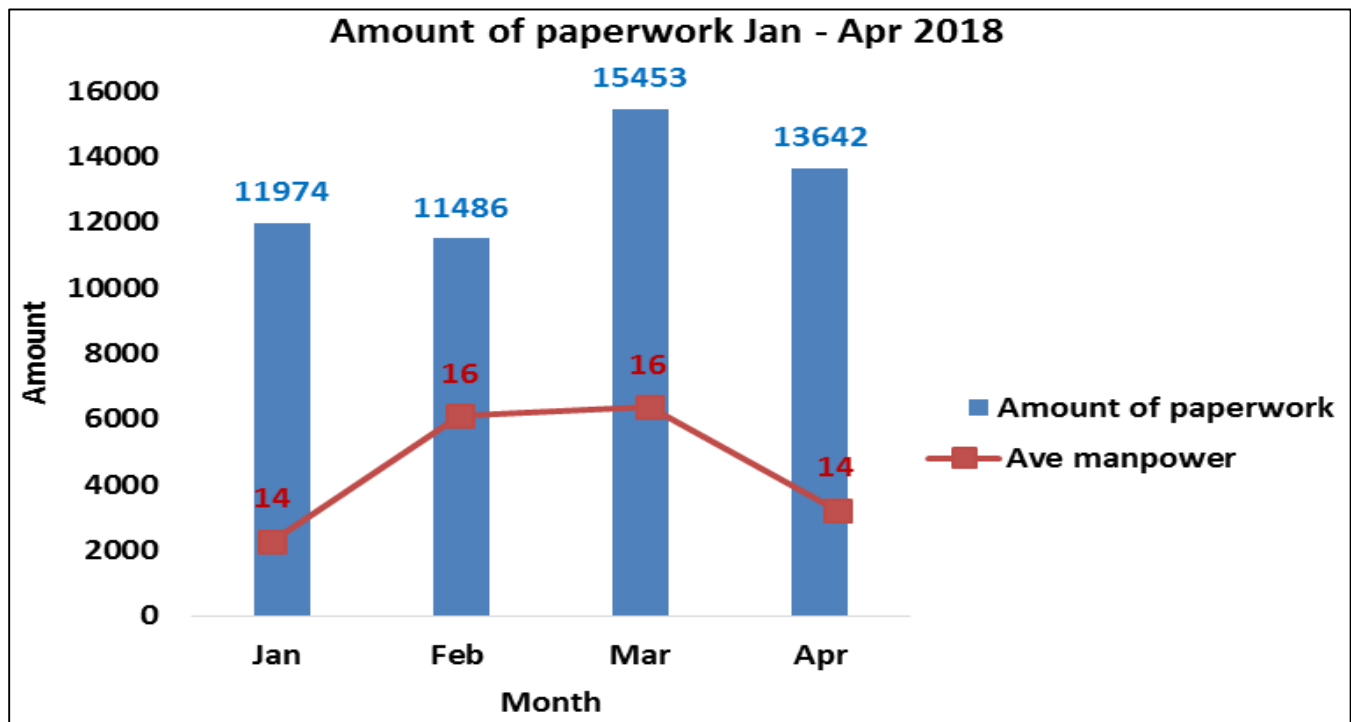


Figure 12: Number of paperwork received daily

Figure 13 shows the number of paperwork received and available manpower daily in January 2018. In average, CPE agents received a total of 443 paperwork daily to be distributed among an average of 14 people. They received most paperwork on Day 1, 5 and 6, which were 448, 495 and 539 respectively, where it was when the number of employees was the lowest, at 13 people. CPE agents received 35, 38 and 41 paperwork each for those days. The number of employees were less due to 2 agents who were still on maternity leave, which left 15 people and a maximum number of 2 employees who were allowed to take leave on any given day.

Figure 14 shows the number of paperwork received and available manpower daily in February 2018. On average, CPE agents received a total of 483 paperwork daily, to be distributed among an average of 16 people. They received most paperwork on Day 1, 5 and 6, which were 527, 519 and 516 respectively, where it was when the number of employees was almost maximum, at 16 people, except on Day 5. CPE agents received 33, 35 and 33 paperwork each, for those days. The number of employees increased due to 2 agents who returned from maternity leave.

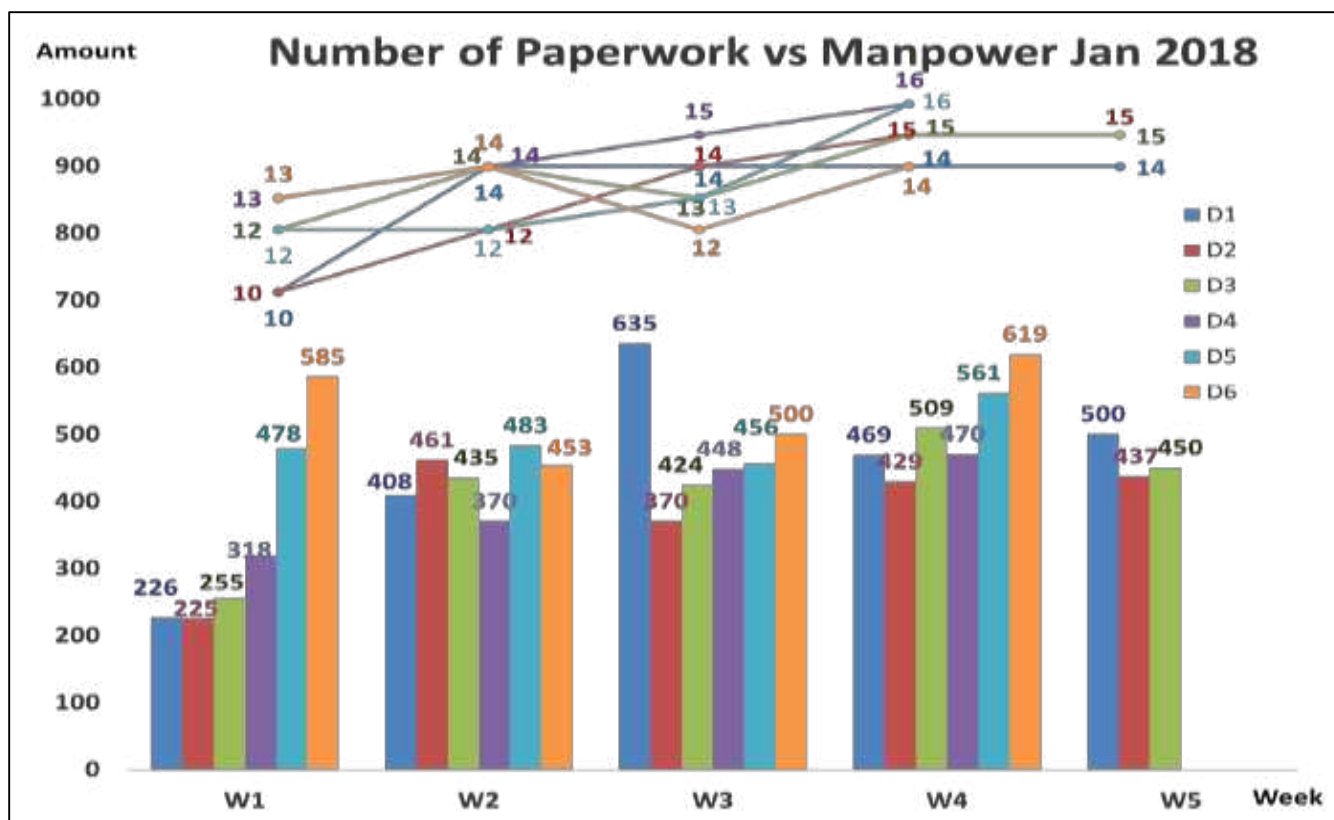


Figure 13: Number of paperwork vs manpower January 2018

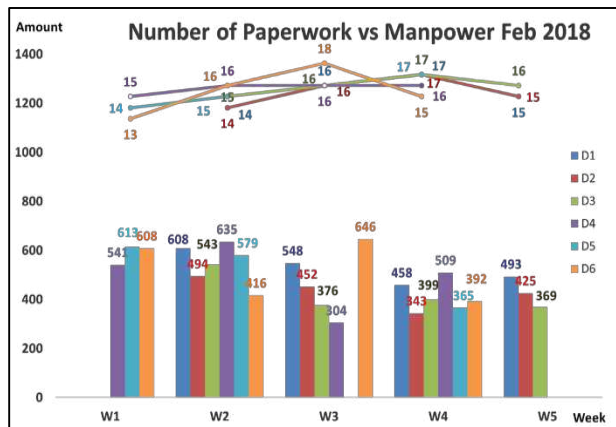


Figure 14: Number of paperwork vs manpower February 2018

Figure 15 shows the number of paperwork received and available manpower daily in March 2018. On average, CPE agents received a total of 572 paperwork daily to be distributed among an average of 16 people. They received most paperwork from Day 1 until Day 6, except Day 2, where the daily paperwork exceeded 550, and the number of employees were mostly 15 people, except on Day 2, at 16. CPE agents received an average of 38 paperwork daily.

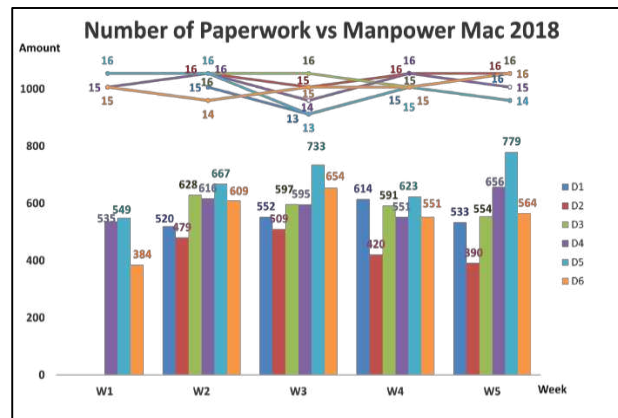


Figure 15: Number of paperwork vs manpower March 2018

Figure 16 shows the number of paperwork received and available manpower daily in April 2018. On average, CPE agents received a total of 546 paperwork daily, to be distributed among an average of 14 people. They received most paperwork on Day 4, 5 and 6, which was 612, 614 and 554 respectively, where it was when the number of employees were 15, except on Day 6, at 14 people. CPE agents received 39-40 paperwork for each of those days. The number of employees decreased to 14 agents due to termination and resignation.

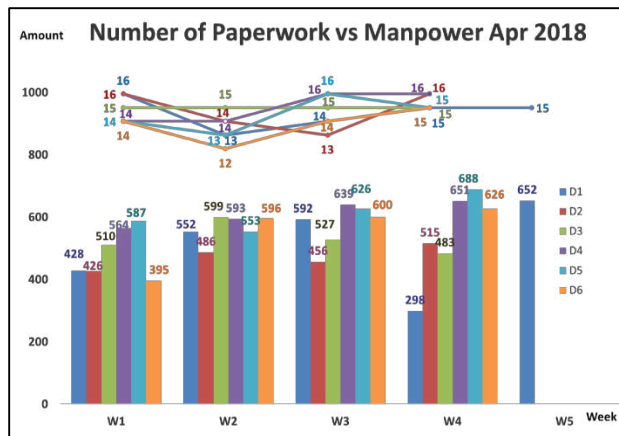


Figure 16: Number of paperwork vs manpower April 2018

3.1 Productivity of employees

From the data collected, the researchers were able to identify the daily productivity of the employees as shown in Figure 18. The productivity of the employees increased with the number of paperwork received daily, particularly on Day 1, 4, 5 and 6. However, the main factor that need to be considered was that, on Day 6, some employees had Saturday off. Therefore, these employees needed to manage paperwork for both Day 6 and Day 1. Unplanned leave on Mondays caused serious and critical situations to other employees.

The green line shows the acceptable average total daily paperwork. The orange line shows an alarming average total daily paperwork. The red line shows the critical average total daily paperwork. An average of 20-30 paperwork daily was manageable for most employees, but more than 40, the employees struggled for the day.

3.2 Actual time required to clear paperwork

In order to analyse the time required to clear paperwork, the employees were classified based on their experience as shown in Figure 17. From a total of 16 participants, 31% were employees with experience of more than 5 years, and between 3-5 years, where the remaining 38% had experience less than 3 years. The hypothesis at the beginning of the research was that more experienced employees had less clearance delay time. The time taken in this research was only for paperwork submitted for duty/tax confirmation. This was to ensure fairness as the difficulties were about the same and could be handled by any of the employees with any work experience.

3.3 Submission delay time vs declaration delay time

In this research, other than clearance time, submission and declaration time were identified too as the delay caused delay to the clearance time as well. The submission delay time was calculated starting from 9.00 am, as it was the time where most companies started the business hours. Figure 18 showed that none of the employees succeed in submitting paperwork less than 60 minutes, or within 1 hour from 9.00 am. Only 62.5% of the employees submitted the paperwork between 60-120 minutes, or within 2 hours, where the remaining 37.5% took more than 2 hours for paperwork submission. Subsequently, late submissions led to more declaration time. Figure 19 also showed that employees with more experience had better paperwork

submission rates. Nevertheless, declaration time was mostly subjected to the volume of the submitted paperwork regardless of the timing for paperwork submission. However, the later the paperwork submission, the later the paperwork was declared. Figure 20 shows the average submission and declaration delay time based on the experience, which proved that employees with more experience had lesser submission and declaration time. Employees who had an experience of more than 5 years required an average of 107 minutes to submit paperwork, followed by 115 minutes by employees with experiences between 3-5 years, and 155 minutes for employees who had less than 3 years of experience.

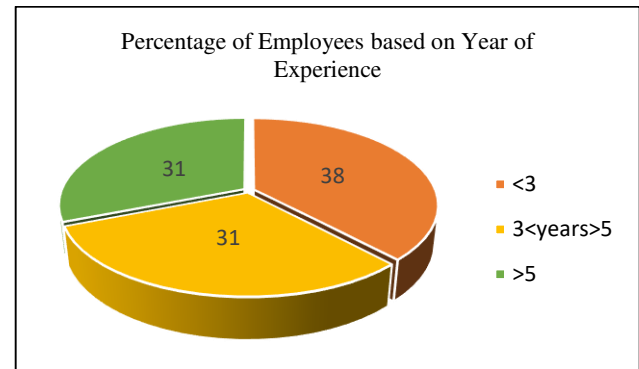


Figure 17: Percentage of employees based on experience

However, less did not mean better if the employees required more than 1 hour to submit paperwork, as its delayed the declaration time, which can take up to 228 minutes or more than 3 hours. The shipment would not be able to be cleared in time for same day delivery, which leads to customer dissatisfaction and losses to the company. The current average submission delay time was 126 per employee, where the declaration delay time at an average of 154 minutes per paperwork. These caused the declaration to be completed only by 12.34 pm. There was high probability of unsuccessful clearance delay for the same day delivery, as the noon shuttle leaves at 1.00 pm daily.

3.4 Benchmark of standard time

Table 5 shows the clearance delay time based on experience. Only 37.5% of the employees cleared the paperwork less than 1 day, where the remaining 62.5% took 3 or more days to clear the paperwork. This result was for paperwork that only required duty/tax confirmation. For other paperwork requirements, which required more complex details, more days are expected. Therefore, the benchmark for standard time paperwork clearance is proposed to be not more than 1 day, especially for duty/tax confirmation.

Table 5: Clearance delay time (day) based on experience

Max Clearance Delay (day)	1	3	<3
Years>5	1	4	0
3<Years>5	4	1	0
Years<3	1	3	2
Total	6	8	2

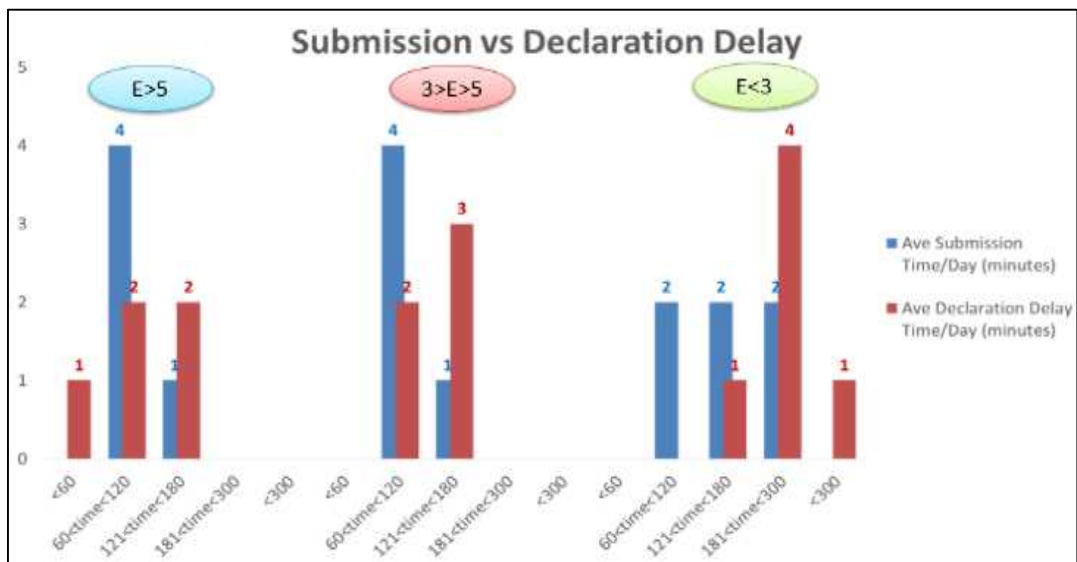


Figure 18: Submission VS Clearance Delay Time Based on Experience

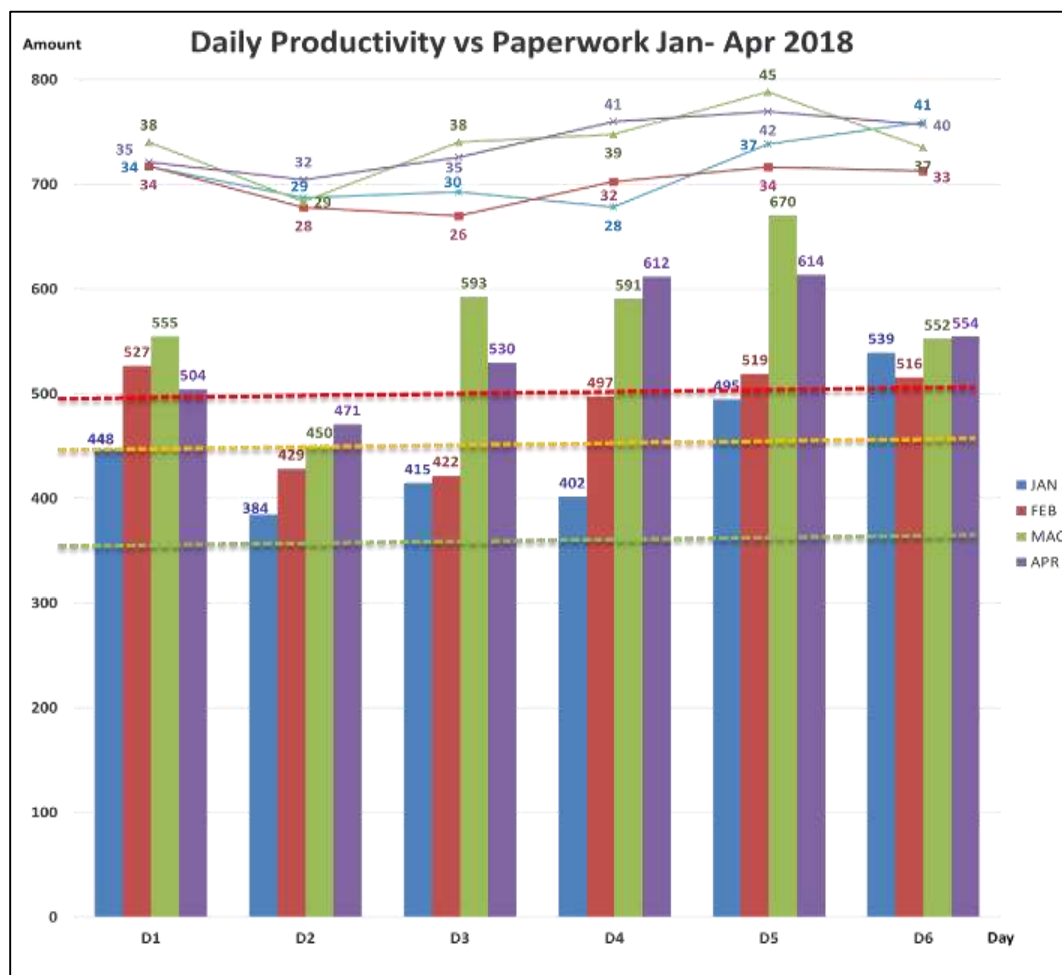


Figure 19: Daily productivity vs number of paperwork January – April 2018

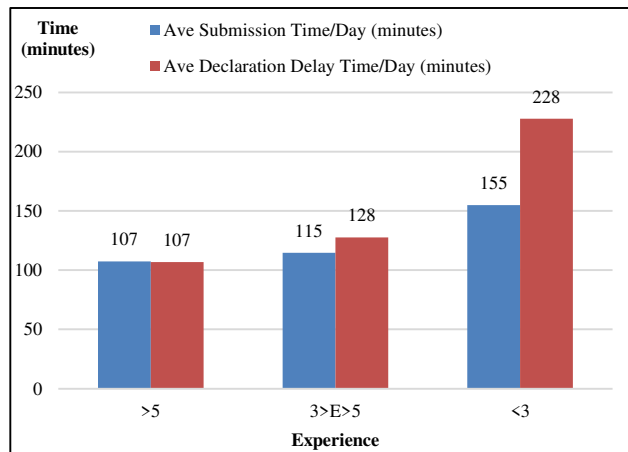


Figure 20: Average submission & declaration delay time based on experience

Table 6: Number of employees based on experience in work groups

Group	Experience	Number of employees
G1	Years>5	1
	3>Years>5	1
	Years<3	2
G2	Years>5	0
	3>Years>5	2
	Years<3	1
G3	Years>5	2
	3>Years>5	1
	Years<3	1
G4	Years>5	1
	3>Years>5	1
	Years<3	0
G5	Years>5	1
	3>Years>5	0
	Years<3	2

As shown in Table 6, the number employees were tabulated based on the experience in their workgroup. It showed that the employees were distributed and grouped almost equally based on the work experience. As shown in Figure 21, the average time of paperwork submission varied among their workgroup. Group G1 showed the best average submission time, followed by G3 and G4, compared to G2 and G5, which mostly were due more number employees with more experience in their work group, as shown in Figure 22.

3.5 Causes of paperwork clearance delay

The paperwork clearance can be delayed due to various reasons. These causes were analysed by utilizing the Ishikawa Diagram, 5 Whys and the 3M model. Factors for paperwork clearance delay were illustrated using the Ishikawa diagram as shown in Figure 23 below. There were 4 factors identified as man, machine, method and material. The Man factors were contributed by the number of headcount and their competency based on employee's work experience. The lesser the number of the head count, the more the paperwork received by an employee which

led to clearance delays. Employees with more experience required less clearance time because they had better customer knowledge and work coordination based on workload. The Machine (printer) factor contributed to paperwork clearance delays due to the layout and limitation. There were 2 printers used by CPE agents for faxing, scanning and printing, shared by a total of 25 employees. The number of machines should not be an issue, except its location. The machines were located at the back of the department, which caused the employees lots of time to fetch printed paperwork or fax. If an employee spent 30 seconds going to the printer, the time spent for an average of 30 paperwork was around 20 minutes, due to non-value-added movement.

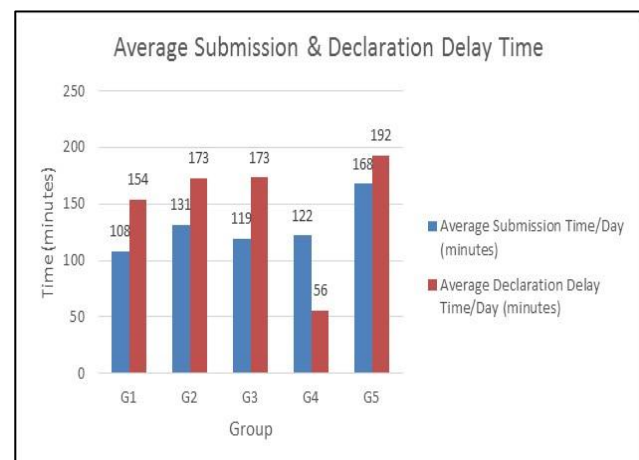


Figure 21: Average submission & declaration delay time based on experience by work group

The Method factor included the paperwork segregation and frequency of segregation. The CPE agents received return and fresh paperwork at 8.00 am, 10.00 am, 2.00 pm, 3.00 pm and 4.00pm. The number of paperwork varied and were distributed based on the number of paperwork received at 8.00 am. If a group received more numbers in the morning, the fresh segregated paperwork was distributed accordingly so that the total number of paperwork received daily by each employee was almost the same. The employees needed to notify the customers once they received the paperwork. The issue appeared if the employees were not able to notify and received updates from the customers within the same day and were delayed to the next day. The Material factor which dealt with returned/rejected paperwork affected the clearance time significantly for the employees. Most of this paperwork was delayed due to requirements such as SIRIM permits, poison licenses, etc. These requirements took longer days to obtain from the customers, as it involved other government agencies. If an employee had more numbers of returned/rejected paperwork, the employee still needed to contact the customers on a daily basis for the update.

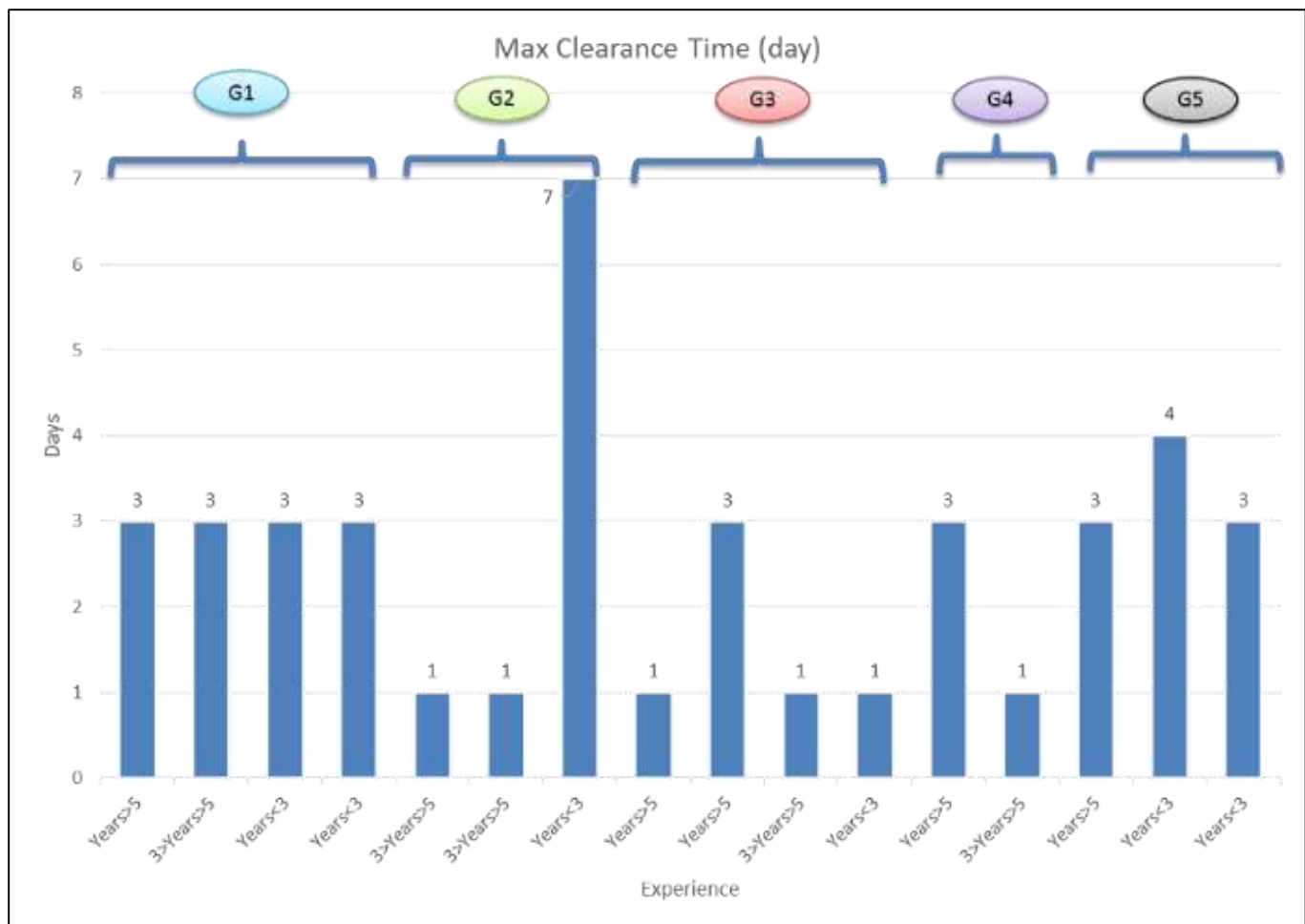


Figure 22: Maximum clearance delay based on experience by work group

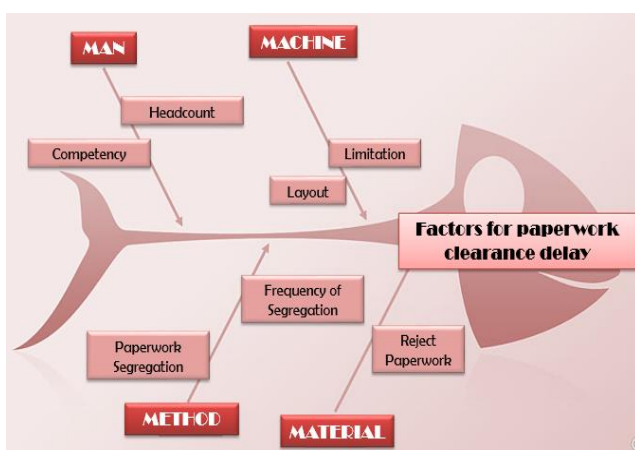


Figure 23: Ishikawa diagram – Factors for paperwork clearance delay

Thus, it reduced the time left for fresh paperwork in the day. The 5 Whys helped to investigate to root cause of clearance delays:

Example A

- Why was the paperwork clearance delayed?

* The delay was due late paperwork submission.

- Why was the paperwork submitted late?

* The submission was delayed as the updates received from customers were late.

- Why the customer were updates late?

* The Customer updates were late as calls made to customers were late.

- Why were the calls to the customer late?

* The agent spent more time attending to email updates.

- Why did the agent spend more time attending to email updates?

* Customers replied to the email earlier than the intended calls were made. From Example A, the researcher concluded that the agent submitted the paperwork based on the received email, but spent more time, which caused delays for the paperwork that required calls to be made.

Example B

- Why was the paperwork clearance delayed?

* The delay was due late paperwork submission for clearance.

- Why was the paperwork submitted late for clearance?

* The clearance agent received the declared paperwork late.

- Why was the declarant late for clearing the paperwork?

* The declarant declared paperwork after 11.30am.

- Why did the declarant declare the paperwork after 11.30 am?

* Declarant took more time to declare paperwork before 11.30am.
 - Why did the declarant take more time to declare the paperwork before 11.30am?

The declarant declared lots of submitted paperwork. From Example B, the researcher concluded that the clearance delay was due to the late declaration, as the number of paperwork received before 11.30 am was too much to handle. The 3M model allowed the researcher to identify the waste (Muda) in the paperwork clearance process. There were 3 wastes identifies, defects (returned/rejected paperwork), waiting (customer update) and motion (movement from one process to another). Returned/rejected paperwork consumed much of the agent and customer's time. The agents were required to re-notify the customers on the clearance delay and the customers were required to validate for missing information. It caused frustration for both the agents and the customers.

The fastest communication received updates from the customers via calls/emails followed by fax. Email updates allowed shorter clearance time, provided the email received was very early in the morning, and the paperwork was submitted right away for clearance. Updates via calls as well allowed the agent to submit the paperwork very early if calls made or received in the earlier part of the day. However, fax took more time as the agent only realize later. Nevertheless, regardless which medium of communication, the most important factor was the time the updates were received, and paperwork submitted.

3.6 Improvement and Control

For improvement, the researcher proposed that the company offer training guidelines to the new employees. The current training is only provided by the senior agents based on their experience, which is not standardized. Different senior agents have different ways of working more productively and efficiently. However, the most important is that the paperwork submission must have complete information to ensure a smaller number of reject/returned paperwork, where most of this paperwork belongs to the least experienced agent.

For improvement and control, the researchers proposed a revision of the Standard Operating Procedure (SOP) for paperwork clearance as shown in Figure 24. It ensures that for any kind of delayed paperwork is submitted with complete information, thus reducing the amount of reject/returned paperwork.

4 Conclusion

It was concluded that the number of paperwork received daily was 516, which was distributed among an average of 15 employees from January until April 2018. Each employee received an average of 34 paperwork daily. The amount of paperwork received by each employee was at an alarming level. It was also concluded that the time required to complete the paperwork for duty/tax confirmation were 3 days, or more for most of the employees at 62%. Therefore, based on the results of the findings, the proposed benchmark of the standard time for paperwork clearance should not be more than 1 day to allow for same day delivery to the customers as per the commitment promised by the company. This proposed benchmark is relevant due the difficulty level and is the same for all employees. Clearance should be completed before 12.30 pm to meet the noon shuttle which leaves at 1.00 pm daily.

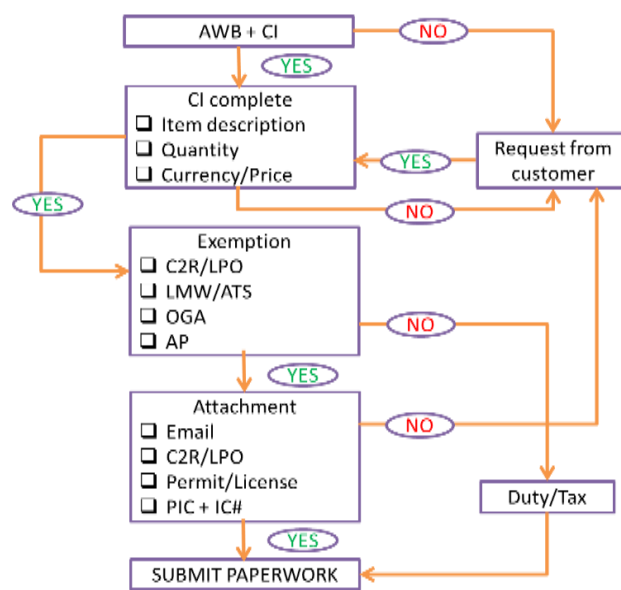


Figure 24: Revised SOP for paperwork submission

Acknowledgment

The authors would like to express the greatest appreciation and utmost gratitude to the Ministry of Higher Education, MyBrain15 MyPhD Ministry of Higher Education, UTM Razak School of Engineering & Advanced Technology and Universiti Teknologi Malaysia (UTM) for all the support given in making the study a success. VOT UTM: Q.K130000.2656.16J42.

Ethical issue

Authors are aware of, and comply with, best practice in publication ethics specifically with regard to authorship (avoidance of guest authorship), dual submission, manipulation of figures, competing interests and compliance with policies on research ethics. Authors adhere to publication requirements that submitted work is original and has not been published elsewhere in any language.

Competing interests

The authors declare that there is no conflict of interest that would prejudice the impartiality of this scientific work.

Authors' contribution

All authors of this study have a complete contribution for data collection, data analyses and manuscript writing

References

- [1] United Nation Sustainability Goal Development number nine "Industry, Innovation and Infrastructure". (Access on 11 November 2019).
- [2] Alvarado Alejandro, I., Jorge L. Garcia, A., Manuel Ivan Rodriguez, B., & Aide, M. Optimization of the material flow in a manufacturing plant by use of artificial bee colony algorithm. *Expert Systems with Applications*; 2013, 40(12), 4785–4790. <https://doi.org/10.1016/j.eswa.2013.02.029>.

- [3] Diawati, P., Paramarta, V., Pitoyo, D., Fitrio, T., Mahrani, S.W. Challenges of implementing an employee management system for improving workplace management effectiveness. *Journal of Environmental Treatment Techniques*, 2019, 7 (Special Issue), 1200-1203.
- [4] Ismail, A., Ghani, J. A., Ab Rahman, M. N., Md Deros, B., & Che Haron, C. H. Application of Lean Six Sigma Tools for Cycle Time Reduction in Manufacturing: Case Study in Biopharmaceutical Industry. *Arabian Journal for Science and Engineering*, 2014, 39(2), 1449–1463. <https://doi.org/10.1007/s13369-013-0678-y>.
- [5] World Trade Organization. Global trade growth loses momentum as trade tensions persist. Available online on April 2019. Available from : https://www.wto.org/english/news_e/pres19_e/pr837_e.htm. Cited on 10 November 2019.
- [6] Gani, A. The Efficiency of Customs Clearance Processes Can Matter for Trade. *International Advances in Economic Research*, 2016, 22(1), 109–110. <https://doi.org/10.1007/s11294-015-9556-6>.
- [7] Liu, L., & Yue, C. Investigating the impacts of time delays on trade. *Food Policy*; 2013, 39, 108–114. <https://doi.org/10.1016/j.foodpol.2013.01.001>
- [8] Mahesh, M., Wong, Y. S., Fuh, J. Y. H., & Loh, H. T. A Six-sigma approach for benchmarking of RP&M processes. *The International Journal of Advanced Manufacturing Technology*; 2006, 31(3–4), 374–387. <https://doi.org/10.1007/s00170-005-0201-z>.
- [9] Gijo, E. V., & Scaria, J. Process improvement through Six Sigma with Beta correction: a case study of manufacturing company. *The International Journal of Advanced Manufacturing Technology*; 2014, 71(1–4), 717–730. <https://doi.org/10.1007/s00170-013-5483-y>.
- [10] Hans-peter, W., & Anis, S. Proactive supply chain management in the forging industry; 2008, 425–430. <https://doi.org/10.1007/s11740-008-0121-5>
- [11] Gaikwad, LM, Sunnapwar, VK, Teli, SN, & Parab, AB. Application of DMAIC and SPC to Improve Operational Performance of Manufacturing Industry: A Case Study. *Journal of The Institution of Engineers (India): Series C*, 2017, 1–10. <https://doi.org/10.1007/s40032-017-0395-5>
- [12] Diawati, P., Paramarta, V., Pitoyo, D., Fitrio, T., Mahrani, S.W. Challenges of implementing an employee management system for improving workplace management effectiveness. *Journal of Environmental Treatment Techniques*, 2019, 7 (Special Issue), 1200-1203.
- [13] Yuliyono, AD, Baehaki, D, Luqman, D, Utama, N. and Wibowo, A. Six Sigma Based Performance Measurement of Tax Return Processing Improvement (Case Study: Directorate General of Taxes For Republic of Indonesia). *IOP Conf. Series: Materials Science and Engineering*, IOP Publishing; 2019, 598(012057), 1-8. Available online, DOI:10.1088/1757-899X/598/1/012057.
- [14] Sharma, G. and Rao, PS. Process capability improvement of an engine connecting rod machining process. *Journal of Industrial Engineering International*; 2013, 9(1), 37. <https://doi.org/10.1186/2251-712X-9-37>.
- [15] Sharma, GV & Rao, PS. A DMAIC approach for process capability improvement an engine crankshaft manufacturing process. *Journal of Industrial Engineering International*; 2014, 10(2), 65. <https://doi.org/10.1007/s40092-014-0065-7>.
- [16] Sharma, G. V. S. S., Rao, P. S., & Babu, BS. Process capability improvement through DMAIC for aluminum alloy wheel machining. *Journal of Industrial Engineering International*; 2017, 1–14. <https://doi.org/10.1007/s40092-017-0220-z>.
- [17] Langabeer, J. R., Dellifrairie, J. L., Heineke, J., & Abbass, I. Implementation of Lean and Six Sigma quality initiatives in hospitals: A goal theoretic perspective; 2009, 13–27. <https://doi.org/10.1007/s12063-009-0021-7>.
- [18] Kumaravadivel, A., & Natarajan, U. Application of Six-Sigma DMAIC methodology to sand-casting process with response surface methodology. *The International Journal of Advanced Manufacturing Technology*, 2013, 69(5–8), 1403–1420. <https://doi.org/10.1007/s00170-013-5119-2>.