INTERNSHIP REPORT
PT. KANISIUS YOGYAKARTA

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INTERNATIONAL INDUSTRIAL ENGINEERING STUDY PROGRAM
FACULTY OF INDUSTRIAL TECHNOLOGY
UNIVERSITAS ATMA JAYA YOGYAKARTA
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VALIDATION PAGE

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Demikian surat keterangan ini kami sampaikan. Atas kepercayaan yang diberikan kami ucapkan terima kasih.

Yogyakarta, 9 November 2018
Hormat kami,

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PREFACE

A thousand gratitude I give to God, our Lord Jesus Christ, for because of His Grace and guidance, I am able to write and complete the internship program.

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CHAPTER 1

INTRODUCTION

1.1. Background

Industrial Engineering Study Program of Universitas Atma Jaya Yogyakarta obligates all of its students to conduct an internship or work practice in accordance to the IESP curriculum. IESP believes that the work practice/internship can be used as an arena for the students to develop, improve, and grow professional work ethics as an industrial engineer.

Work practice paradigm is that the students are expected to experience first-hand the application of Industrial Engineering theories. The student is working in a company he/she had chosen. Working, in its own sense, encompasses the planning, design, improvement, application, and solving of a specific problem. Therefore, the tasks that the student has to do in an internship or work practice are:

1. Recognizing the company's environment
2. Keeping pace with the company's working process continuously
3. Finishing the task given by a superior, supervisor, or field supervisor.
4. Observing system's behavior
5. Compiling a written report
6. Engaging in an internship test

Since an industrial engineer engages in system elements such as Man, Material, Machine, Money, Method, Environment, Energy, and Information; the student must relate all of their activities with either one or more aforementioned elements.

1.2. Objectives

The objective of the internship or work practice are:

a. Train discipline
b. Train the ability to interact with subordinates, work partners, and superiors within a company
c. Train the ability to adapt in a work environment
d. Directly observe a company's activities in running their business
e. Complement the theories learned within classes with actual practice within a company

f. Enhance insights regarding production and business system

1.3. Location and Time of Industrial Practice

The industrial practice was conducted at PT. Kanisius (Printing and Publishing). The company is located at Cempaka Street No. 9, Deresan, Caturtunggal, Kecamatan Depok, Kabupaten Sleman, Special Region of Yogyakarta. The period of the industrial practice is between 6th of August 2018 until 7th of September 2018.

The student was originally assigned to the Logistics department, doing tasks such as recording and writing documents related to the main printing materials, paper and plate. Besides that, the student also has to deliver the paper that had been cut to the printing department. However, it turns out that the Pre-Printing department needed help. Hence, the student was transferred to assist the pre-printing in printing and delivering the plates. Only after two weeks the student was reassigned back to the Logistics department.

There are two different shifts in a day for the workers in PT. Kanisius Yogyakarta. The first shift starts at 07.30 – 15.00, whilst the second shift starts at …. – 21.00. All employees are required to arrive before 07.30 because morning prayers and briefings are conducted at that hour.

CHAPTER 2

COMPANY OVERVIEW

Chapter 2 aims to give a general description of the company in which the student conducted the internship. This includes its brief history, organizational structure, and the company management itself. Company management encompasses its vision and mission, marketing, human resource, facility, and other important functions that allow PT. Kanisius to conduct their business activity.

2.1. Brief History of PT. Kanisius

PT. Kanisius was formed long before Indonesian Independence on 26th January 1922. It was originally formed as a missionary work with the name Canisius Drukkerij (KANISIUS Printing). Its main function at the time was to print books for students and also prayer book for the Indonesian Catholic Church.

Soon after Indonesian Independence, PT. Kanisius was given a task by the Indonesian government to print a book called ORI (Oeang Republik Indonesia). The book played a vital role in the government's attempt to defend Indonesian Independence and strengthens it after the proclamation.

Around 1970s, the printing company is starting to be managed by both Jesuit Pastors and laymen. Because of this partnership, it was also during this time Kanisius experienced a lot of modernization process, human resource development, and financial independence.

In mid 1990s, Kanisius starts to expand their business to include magazine printing and multimedia products. Not much later, in response to the changing world and information technology, Kanisius includes audio cassettes, interactive CDs, greetings card, posters, etc.

Starting 1st January 2014, *Penerbit-Percetakan Kanisius* officially changed its name and legal status into PT. Kanisius. This legal status change does not alter any of Kanisius vision or mission. They remain true to their main objective which is to help realize a society which are both nationalists and dignified.

2.2. Organizational Structure

PT. Kanisius' organizational structure is mostly vertical and has a strict hierarchical relationship. On top of the hierarchy is the board of directors, with its

head being the president director. The board is responsible for major strategic decisions within the company, for example is whether or not buy a new expensive cutting machine, salary increase for employees, etc.

Since Kanisius' original founder was the Jesuit congregation, there are some priests that were placed as members of the board. Other than priests, there are also laypersons that are included as company board members. Figure 2.1 is the position of the board of directors on the top of organizational structure.

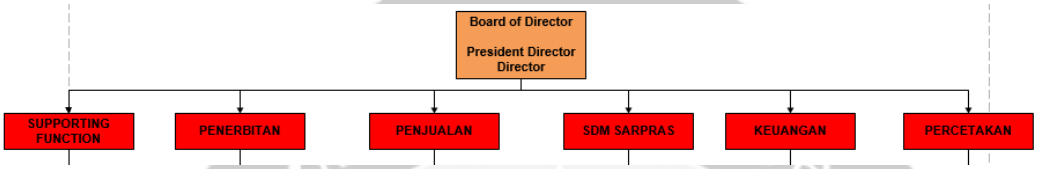


Figure 2.1. Board of Directors of PT. Kanisius and the Divisions

Below the board of directors are the sixmain divisions of the company. Kanisius' divisions are divided based on their functions. They are publishing, sales, human resource management and facilities and infrastructure, finance, supporting function, and printing division. Each of the division has its own set of responsibilities and authorities; and are governed by a division head.

Normally, each of the division would have their own departments, which in turn would have sub departments and units at the bottom. However, there are some departments that functions independent of any division, such as Company Secretary and Public Relations, Research and Development, Purchasing, and Engineering. The reason they are independent is because they work closely with almost all departments and putting them under one division would limit their communication's efficiency and effectiveness. Figure 2.2 depicts such departments, located under the supporting function division. Note that the division of supporting function does not actually exist within the company, it is simply added to group the previously mentioned division-less departments and sub departments.

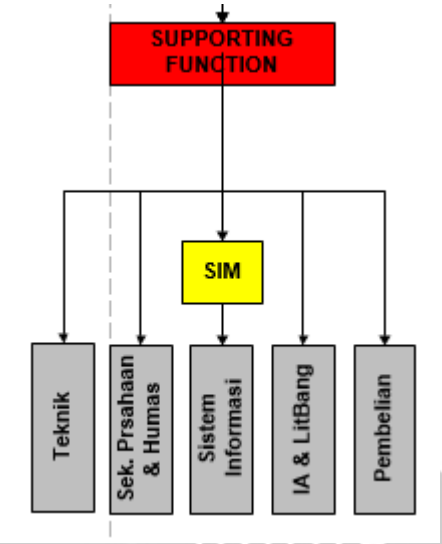


Figure 2.2. Supporting Function of PT. Kanisius

Figure 2.3 is the organizational structure of the Publishing Division. The publishing division possess three departments, each with its own department head; ecclesiastical products, general education products, and Kanisius Exclusive Publishing. Basically, each department is responsible to manage a certain type of products helped by their own sub-departments and units. Ecclesiastical department takes care of Church books and literature publishing, of which usually comes from the Catholic Church themselves. General Education department is responsible for publishing books about education in general, of which most of them are from educational institutions. KEP is unique because it takes care publishing orders from individuals or organizations, whose books does not touch the Catholic Church subjects or educational subjects. All of the departments have editors and marketing sub departments, with each editor helped by an artistic unit responsible for design-related processes.

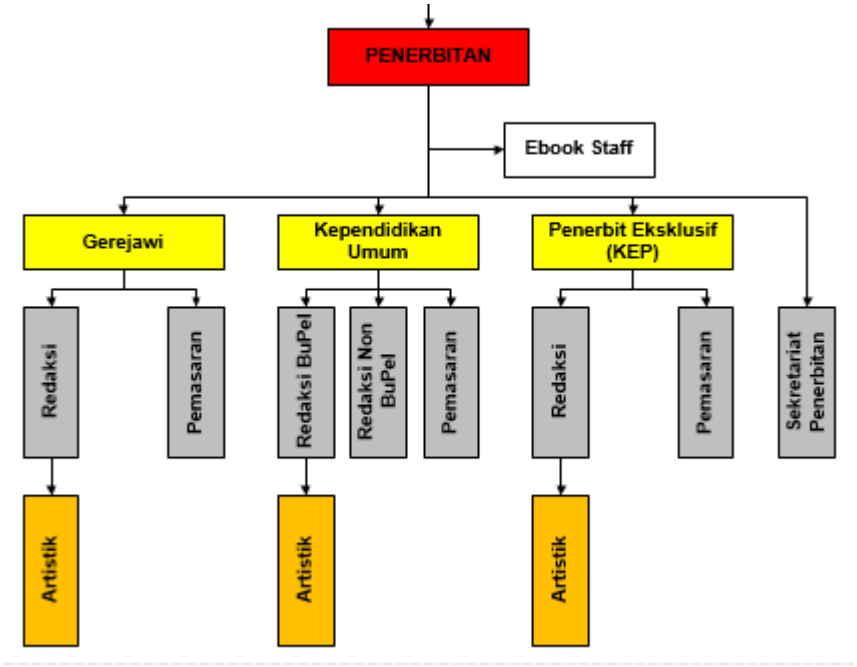


Figure 2.3. Publishing Division of PT. Kanisius

Figure 2.4 is the organizational structure of the sales division Sales division is divided into two departments, trading and sales department. Trading department is responsible for the various *Taman Komunikasi* sub departments which are spread across Indonesia, whereas sales department is responsible for the marketing offices, who are their sub departments. Sales department is therefore also responsible to handle all the activities occurring within each marketing offices, including incoming orders or finding potential customers. And because all of the *Taman Komunikasi* sells Kanisius products, trading department is responsible to handle all the problems concerning those subsidiaries.

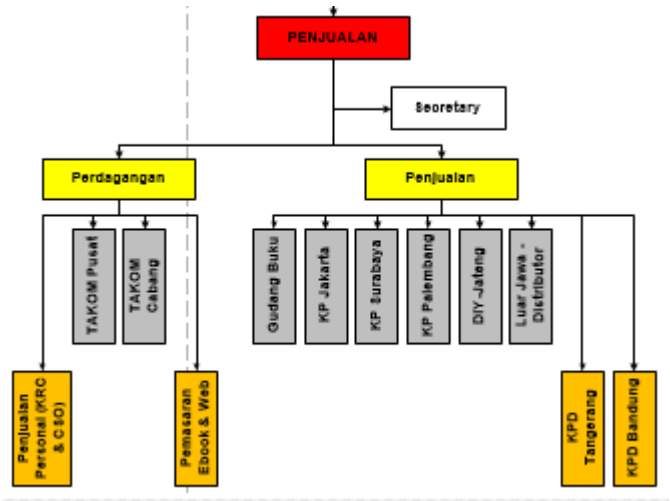


Figure 2.4. Sales Division of PT. Kanisius

Figure 2.5 is the organizational structure of the human resource division. Human resource management and facilities and equipment division only have one department, development, who are responsible for developing and maintaining company employees. They are also responsible for the recruitment process. In addition, there is one sub department that is responsible directly to the division head, which is the facilities and equipment, consists of units such as security, maintenance, vehicle, and garden.

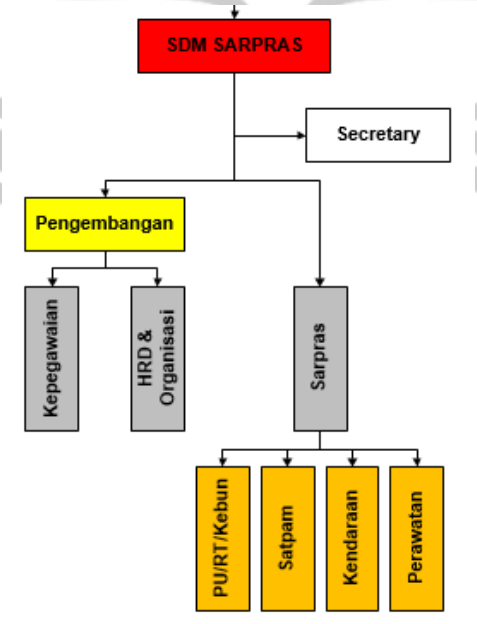


Figure 2.5. HRM and Facilities and Equipment Division of PT. Kanisius

Figure 2.6 is the organizational structure of the finance division. Finance division is pretty much straightforward, consisting of two departments which are finance and accounting. Finance department possess two sub department, account receivables and business administration; while accounting department have calculation and accounting sub departments. Basically, they are responsible to handle the money flowing through the company, paying suppliers, auditing system, etc.

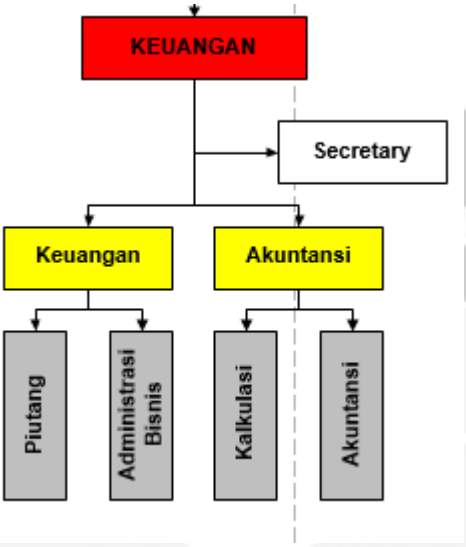


Figure 2.6. Finance Division of PT. Kanisius

Figure 2.7 is the organizational structure of the printing division. Printing division is responsible for the printing process that happens within the company, it consists of print service marketing, PPIC, and production department. Print Service Marketing's main job is to handle incoming printing orders and make sure that both old and new customers have the best of services. They will also handle the proofing for customers to prevent errors in subsequent printing process.

PPIC department's main task is to make a production schedule and make sure that materials are available for production process to occur. They are helped JSA-Expedition and Logistics sub departments. Production department is responsible for the actual production processes that occur within the floor, they possess three sub departments; pre-printing process and digital, offset printing, and post-printing; each with their own distinct activities and processes.

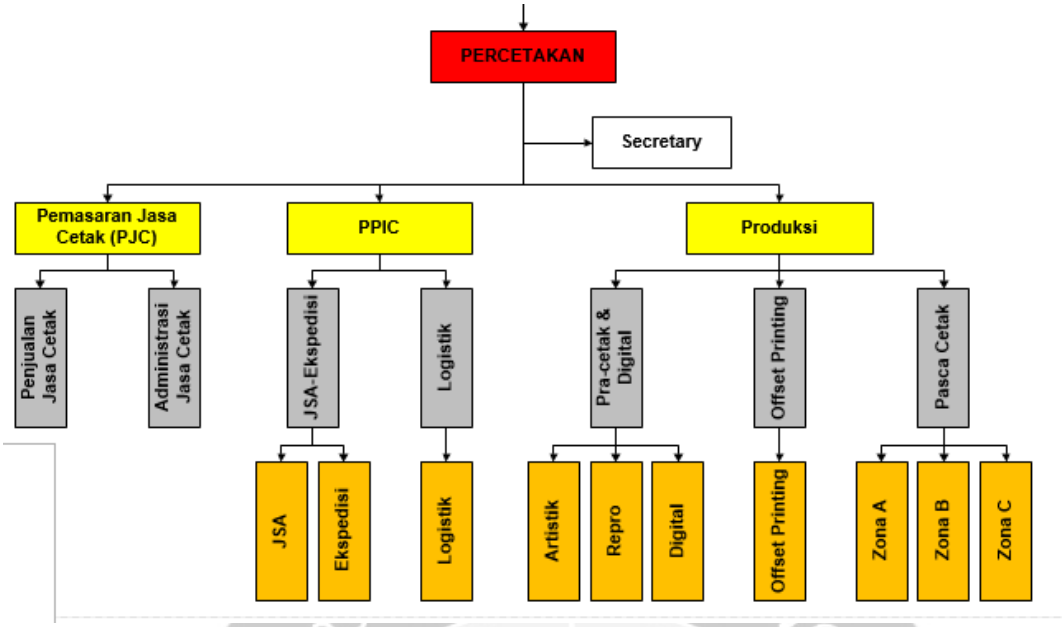


Figure 2.7. Printing Division of PT. Kanisius

2.3. Company Management

2.3.1. Vision and Mission

As a company, PT. Kanisius owns both vision and mission as a way to keep the company staying true to its original purpose.

Vision:

Become a professional company and the main choice of customers through publishing, printing, and sales in order to realize a nationalists and dignified society.

Mission:

1. Involve oneself in the Church's work and society education.
2. Prioritize customer satisfaction by providing published products, printing products, Church equipment and education, which are both comprehensive and quality.
3. Strengthen and increase the number of customers by building the Communication Park and synergize with strategic partners.
4. Achieve growth and profitability through increase of sales and cost control.
5. Increase employees' productivity by using a professional human resource development system.
6. Utilize the proper technology in order to optimize business operation and creating innovative products.

The values of PT. Kanisius as a company are:

1. Honesty
2. Discipline
3. Spry
4. Competent
5. Learner

2.3.2. Employment

a. Recruitment

Employee recruitment at PT. Kanisius is done by the Department of Human Resources and Equipment. The company opens the recruitment process every year in line with the needs of each departments or divisions. Therefore, the positions offered each year varies according to each department's request to the Department of Development.

The vacancies are distributed through various channels, such as social medias and the official corporate website. Since PT. Kanisius is affiliated with the Catholic Church, it is not uncommon to see the company's job vacancies listed in a Church's information board; or even announced after the mass.

The recruitment process of PT. Kanisius can be divided into four different stages. It starts with an administrative selection process, in which the candidates are initially selected based on their submitted documents such as Curriculum Vitae. If a candidate is able to pass this stage, he/she will continue to a written and interview test. In the case of an internship, both the written and interview test are done simultaneously. But for permanent employment, they are done separately from each other. After the interview test, an employee who manages to get to this stage will be called by PT. Kanisius for salary negotiation. When both the employee and PT. Kanisius reach an agreement, then the employee is officially selected.

On the first three months, an employee will be put through an evaluation period. Not to mention that he/she will be given an introduction to PT. Kanisius as a whole; what the company stands for, its brief history, ISO certifications, health and safety system, standard operating procedure for his/her department, etc. After three months, the employee will be evaluated based on his/her performance and the management shall act accordingly.

There exists a system for employees who have served in PT. Kanisius for a specific amount of time, they will be given extra paid leaves in a year. This extra paid leaves is outside the basic paid leaves that each employee has, so the longer you work in PT. Kanisius, you are basically given more possible day offs.

The recruitment process for intern is more or less the same compared to regular employment. First the candidate must submit a proposal to PT. Kanisius, after which HR would review the documents thoroughly. Assuming that the candidate's documents are sufficient and deemed qualified, he/she will be invited to do an interview and written test. About 1 week after the interview, should the candidate succeed, an email will be sent notifying his/her success.

b. Compensation System

The compensation system of PT. Kanisius follows the 3P principles, which are Pay for Position, Pay for Performance, and Pay for Person. Besides the main salary, PT. Kanisius also gives allowances to each of the employee. An employee gets three kinds of allowances should he/she fulfill the necessary conditions. There ismoney allowance for husband/wife, money allowance for children (based on the number of children), and rice allowance for the employee (including his/her family).

Wage cuts are also applicable to an employee should he/she arrives late to work, did not come to work at all, or leaving early from work due to some reasons.

c. Working Hour

There are two different types of working hour for employees in PT. Kanisius, office working hours and logistics/PPIC working hours. For office working hour, from Monday to Friday it starts at 07.30 WIB in the morning until 15.00 WIBin the afternoon. Whilst on Saturday, it starts at 07.30 WIB in the morning until 12.30 WIB in the noon. Break hours, which only exists on Monday until Friday, starts at 11.30 WIB until 12.00 WIB in the noon.

Logistics and PPIC working hours differ with the office working hour in the sense that they have two different shifts in a day. From Monday to Friday, the first shift starts at 06.30 WIB in the morning until 14.00 WIB in the afternoon. The first shift's break starts at 10.30 WIB until 11.00 WIB. It then continues to

the second shift which starts at 13.30 WIB until 21.00 WIB in the evening. Second shift break starts at 17.30 WIB until 18.00 WIB. Saturday is a bit different where the first shift starts at 06.30 WIB and ends at 11.30 WIB. The second shift starts at 11.00 WIB until 16.00 WIB. Just like the office working hour, there are no break hours on Saturday. The logistics and PPIC working hour also apply to other departments directly related to the production floor. An example is the CTP (computer to plate) sub unit, which is a part of the pre-printing department.

2.3.3. Marketing

PT. Kanisius has several marketing strategies on hand in order to compete with its competitors. However, it is important to note that the company has been around for a very long time, well before the Indonesian Independence, and therefore it makes sense that PT. Kanisius already has quite the reputation among Indonesian citizens. Catholics, especially those who attended Catholic schools, are guaranteed to at the very least heard of the name Kanisius. This is because Catholic educational books are mostly published and printed by PT. Kanisius. The Church itself frequently trusts PT. Kanisius to print religious books such as guide books for specific prayers, books telling stories of Saints, etc.

Regardless, the Catholic Church is not the only customer of PT. Kanisius. The company, being both a printing and publishing company, serves a variety of customers starting from individuals who wanted to publish a book, a company, university, school, community, and many others. Aiming to establish a stable and diverse market, PT. Kanisius owns several marketing offices spread across Indonesia.

1. Jakarta Marketing Office
   Komplek Ruko Kranggan Permai, RT 16/4 Jl. Alternatif Cibubur, Jatisampurna, Bekasi 17433 Jakarta
2. Tangerang District Marketing Office
   Villa Melati Mas Blok C3 No.22C, Jalan Cemara, Serpong Utara, Tangerang Selatan 15323 Tangerang
3. Bandung District Marketing Office
   Jalan kembar Sari Indah 1 No.12, Cigereleng, Regol, Bandung
4. Surabaya Marketing Office

Kompleks Ruko Rungkut Megah Blok H/1 Jl. Raya Rungkut No. 5, Surabaya 60293 Surabaya

5. Palembang Marketing Office

   Jl. Lintas Barat Sukabangun II Ruko G3 Kelurahan Sukajaya, Kecamatan Sukarami, Palembang

Besides marketing office, PT. Kanisius also established several *Taman Komunikasi (*Communication Park*)* as a way for the company to both market itself and provide the opportunity for people all across the country to read and enjoy Kanisius' books.

1. TAKOM *Pusat*

   Jl. Cempaka No. 9, Deresan, Caturtunggal, Depok, Sleman, Daerah Istimewa Yogyakarta 55281, Yogyakarta. Figure 2.8 is the front view of the TAKOM in Yogyakarta.

Figure 2.8. *Taman Komunikasi* Located within company's Area

2. TAKOM Kanisius Kranggan

   Komplek Ruko Kranggan Permai, RT 16/4 Jl. Alternatif Cibubur, Jatisampurna, Bekasi 17433, Jakarta

3. TAKOM Katedral

   Jl. Katedral No. 7, Jakarta Pusat 10710, Jakarta

4. TAKOM St. Maria

   Jl. Daan Mogot No. 14, Tangerang, Banten 15111, Tangerang

5. TAKOM Santo Laurensius

Jl. Sutera Utama No. 2, Alam Sutera, Serpong Utara, Tangerang Selatan 15326, Tangerang

6. TAKOM Kanisius Rungkut
   Kompleks Ruko Rungkut Megah Blok H/1 Jl. Raya Rungkut No. 5, Surabaya 60293, Surabaya
7. TAKOMSt. Yakobus
   Puri Widya Kencana Blok LL No. 1, Citraland, Surabaya 60231, Surabaya
8. TAKOM St. Antonius
   Jl. Arifin No. 1, Surakarta 57111, Jawa Tengah, Surakarta

PT. Kanisius also has a membership system available for bookworms with its own privileges called KRC (Kanisius Reading Club). The membership aims to provide the most up to date and actual information for its members about Kanisius products. It gives members 25% discount when buying Kanisius books whether through the specialized KRC portal or directly at TAKOM. One only needs to show the membership card when buying books at TAKOM and he/she will get the discount.

2.3.4. Facilities

a. Canteen
   Figure 2.9 is the picture of PT. Kanisius' canteen. The canteen provides meal for employees from Monday to Friday on break hours, which means food are served two times a day. The employees do not need to pay for the food, instead they must redeem a card specifically for eating provided by the company. The card is given to each employee by his/her department head around 15 minutes before break time starts. Without the card, an employee cannot enjoy this benefit at the canteen.

Figure 2.9. Canteen of PT. Kanisius

Tender system is utilized for determining who will cook at the canteen for a specific period of time. PT. Kanisius will offer the position to several tenders. The winner shall have the right to serve the food for a period of time that had been agreed upon.

b. Parking Lot

PT. Kanisius owns several parking lots within its complex. The employee's parking lot and visitor's parking lot are separated. The employee's parking lots are located on the southern part of the complex, both 2-wheeled and 4-wheeled vehicles can park there. In total, 150 two-wheeled vehicles and 16 four-wheeled vehicles can be accommodated for employees. Figure 2.10 and 2.11 are the pictures of the employee's parking lot.

Figure 2.10. Employee's Motorcycle Parking Lot of PT. Kanisius

Figure 2.11. Employee's Car Parking Lot of PT. Kanisius

Figure 2.12 and 2.13 are the pictures of visitor's parking lot. The visitors parking lots are located near the entrance gate of the complex. The parking lot serves both PT. Kanisius' visitors and TAKOM visitors. Maximum capacity is 10 four-wheeled vehicles and 30 two-wheeled vehicles.

Figure 2.12.Visitor's Car Parking Lot

Figure 2.13.Visitor's Bike Parking

Lot

c. Waste Management Facilities

PT. Kanisius has several waste management facilities each accommodating different types of waste. Figure 2.14 until 2.17 are the pictures of waste treatment facilities owned by the company.

Figure 2.14. Trashstorage unit before being taken by garbage trucks

Figure 2.15. Paper Waste waiting to be taken by external party

Figure 2.16.Liquid waste treatment center, both water and chemical

Figure 2.17. Hazardous and Toxic Materials Waste Warehouse

Table 2.1. lists the waste types that PT. Kanisius produces and how they managed them. Waste management is something that the management considers important, especially because printing processes demand certain chemicals that may have hazardous effects towards both the environment and the employees.

Table 2.1. Types of Waste and its Treatment

Type of Waste	Explanation
Hazardous and Toxic Materials (B3) Waste	Due to the nature of the machines used for production, it is inevitable that PT. Kanisius will possess waste that are both hazardous and toxic. Government regulation states that these kinds of wastes have to be treated specially and stored within a specialized containment unit. PT. Kanisius owns a special storage for this type of waste.

Table 2.1. Types of Waste and its Treatment (Contd.)

Type of Waste	Explanation
Paper Waste	Not every paper that are used in the machines ended up being a part of a book. Sometimes, mistakes are made. Also, when papers are cut prior to printing process, inevitably paper waste are made. In PT.

	Kanisius, the papers waste is collected and then sold to an external party for extra money.
Liquid Waste (Chemical)	Residual chemicals used by the machines are collected in a giant drum located within the company's area and then sold to an external party when it is almost full.
Liquid Waste (Water)	The water residue from the production process are processed and sterilized so they can be reused for the bathrooms and tap water.

d. Basketball and Badminton Court

A basketball and badminton court also exist within the company complex to support employee's sport activities. Figure 2.18 is the picture of the court.

Figure 2.18. Basketball and Volleyball Court

e. Open Field

PT. Kanisius owns an open field within its complex. It is often used as the main venue for company's various events, such as Coloring Competition for Elementary School Students, Bible Reading Competition, etc. Figure 2.19 is the picture of the field.

Figure 2.19. PT. Kanisius Logo on the side of the field

CHAPTER 3

COMPANY SYSTEM OVERVIEW

Chapter 3 contents encompasses the system adopted by PT. Kanisius in conducting its business routine. Business process will be given and explained in this chapter. Company's product types, along with its production processes and facilities are also present and shall be thoroughly explained.

3.1. Company Business Process Mapping

The business process of the whole company is runs based on customer order, since PT. Kanisius itself can be categorized as a Make-to-Order company. The trigger for every department to conduct its operation is customer order. If there is no customer order, then there would be almost zero activity within the company, especially the production floor. The full business process map can be looked up on Appendix 2 of this report.

Customer orders are not limited only to orders by external parties, there also could be internal orders which come from within PT. Kanisius themselves. In turn, the orders will produce internal products, which would either helps the company to run its events or even sold. Examples of such products are 53th PT. Kanisius Anniversary and invitation for Kanisius events.

Regardless of type of order, every one of them would eventually find their way into the Marketing department. The department has two sub-departments; Administration and Sales. Sales, judging by its name, has a job to maintain the loyalty of old customers while at the same time searching for new ones. Administration, on the other hand, has the job to process each incoming order and create a job ticket should the customer confirms his/her order.

Before the job ticket is made, the customer has to pay an amount of down payment to PT. Kanisius. The money, in turn, would be received by Finance, who will send notification to Marketing. Note that prior to paying down payment, a meeting had already been conducted between the customer and Marketing to discuss order details. Marketing then contacts the customer again to send design files, in which after receiving the files, would analyze it in detail.

A decision then must be made, which depends on the type of files that the customer gave. Should the file's type be ready-to-print, another decision awaits

whether or not the order is categorized as mass printing. If it is not, the Digital Printing department becomes its destination. Else, the order would go to JSA-Expedition.

If the file is not ready-to-print, then it would have to be sent to File Check and Design department. It is located just next to the Marketing department in order to ease communication and prevent misinformation, since communication between the two are crucial for the next production steps. The File Check and Design department is responsible to process the customer order according to customer's demands and specifications. Thus, maintaining constant communication with Marketing acting as bridge between them and customer is extremely important.

When the design is complete and ready, a proofing must be printed and sent to the customer for approval. Figure 3.1 is the picture of the printer used for printing proofing materials. Only after the approval is given, production process can begin. This step is paramount, because there have been many cases where whole production process must be repeated for a specific order because of miscommunication with the customer. Such an oversight could prove costly.

Figure 3.1. Proofing Machine located within Printing Service Marketing Dept.

When the approval is given, another decision needs to be made. If the order is categorized as mass printingthe processed files along with the job ticket would go to JSA-Expedition. Else, it would go to Digital Printing.

Digital Printing department and Offset Printing department are not connected to each other, they both are independent of each other and can function perfectly whether the other exist or not.

In Digital Printing, they will first receive both job tickets and files. Most customers would choose digital printing because of its speed, as it requires no pre-printing process. However, mass printing in Digital is unfavorable because the cost would be unimaginably high. PPIC staff within the department will process all incoming orders and make an actionable schedule for production, obviously based on the closest deadline. The production can begin immediately after the schedule for the is made.

In the event where papers are not available (paper type depends on customer's demand), a material requisition form is filled and given to the Logistics department. Logistics then will process the requisition form by documenting it in "MD" Form. After that, papers are taken from the warehouse and cut according to specification written on the requisition form. Once finished, the papers are delivered to Digital using a cart.

When papers are available, printing process can begin immediately. When it is done, the printed papers are sent to the post printing sub-area, located also within Digital Printing area.

In PPIC JSA-Expedition, which is a part of Offset Printing department, they also receive both job tickets along with the files. Offset printing differs from Digital, in the sense that it is only used for mass printing orders. Unlike Digital, the more papers printed, the cheaper it gets. Scheduling process for offset printing is a bit more complicated typically because it requires a pre-printing process. Pre-printing involves the plates as an input of the offset machines. After the schedule is done, it is then shared to various departments; mainly Logistics, Printing, and CTP department. The job ticket however, will only be given to CTP department for plate-printing. Note that PPIC-JSA Expedition will also make the job ticket even more detailed, such as determining which type of paper to use, how to cut it, imposition of files, etc.

Soon after job ticket is received, the operator will start working to produce TIFF files according to specifications on the job ticket. TIFF files are the only type of file that could be read by the CTP machine. Each file will act as an input for the machine laser shooter, which will shoot according to page designs. After the file is done, blank plates must be inserted manually into the machine. If plates are not available, a material requisition form is filled and given to Logistics department. Soon after receiving request, Logistics will take the plates from Pre-

Pro warehouse and deliver it to CTP. The material requisition form is given to Logistics for documentation, while a copy is kept within CTP department.

Each order demands different amount of plates depending on the pages and exemplars. When the plates for a specific order have finished printing, they are packed and then sent to Logistics department. In addition, each delivery has to be documented on the Plate Delivery Form.

3.2. Product Variety

As a printing and publishing company, PT. Kanisius main products are books and its related media. In its publishing department, the company has four main product categories.

a. *Gerejawi* (Ecclesiastical)

This category is in line with the origin of PT. Kanisius, when it was first built to support the spread and growth of the Indonesian Catholic Church. Until now, PT. Kanisius still stays true to that mission by the existence of this product category. The products within this category are mostly religious books related to the needs of the Catholic Church, such as the Eucharistic Celebration Book, First Communion Handbook, *Madah Bakti,* etc.

Besides religious books, this category also includes spiritual reading books such as catechists' books, philosophy, theology, etc.

b. *Kependidikan-Umum* (General Education)

Besides publishing books for the Catholic Church, PT. Kanisius also publishes books for educational purposes which falls in this category. The products within this category includes textbooks for all education levels (elementary, junior high school, senior high school, and university). There are also pre-school books for children for the purpose of giving knowledge, ideas, and skill to them.

However, education is not limited to a formal setting such as school. Kanisius realizes this and therefore also include general educational books for society as a whole. Examples are guidebooks on how to cultivate a specific plant, self-development books, handbooks for breeding chickens, etc.

c. Digital Publishing

In response to the growing development in technology, and in turn, its impact on human life, PT. Kanisius developed this product category to be an option for book writers who used PT. Kanisius services in order to publish their

books. The product output in this category are the digitized version of the previously published books. It is important to note that not every published book has its digitized version as it depends entirely upon the writer's decision, whether or not he/she would like the book digitized.

d. Kanisius Executive Publishing

KEP is a service directed towards potential writers as the main customer target. The products within this category are diverse because each writer's demand is unique to one another. As long as the book's overall theme and content is not against Kanisius' vision and mission, general ethics, and government's regulations, then the writer's demands should be fulfilled. Those products are also called external publishing, because the writer or customer wouldn't want PT. Kanisius logo to be on their books.

Besides books, PT. Kanisius also provides services to print other print products. Depending on the quantity ordered, these products can be printed digitally or by using offset printers. Examples of non-book products are magazines, newspapers, packaging box, calendars, brochures, cards, envelopes, etc.

3.3. Production Process

There are two main processes within PT. Kanisius, they are offset printing and digital printing.Due to the expensive price of the machines required to do offset printing, it is reserved and used only for mass printing orders. Offset printing demands pre-printing processes, especially for the plate. Digital printing, on the other hand, is a much faster alternative compared to offset printing; as it derived its source from a computer digital file instead of a physical plate.

a. Offset printing

The offset printing technique is a very old printing technique existing since the late 19th century. The early form of offset printing employs the basics of lithography, which is based on the repulsion property of oil and water. It is called an offset printing because the inked image is first transferred (or offset) to a rubber blanket from a plate. The rubber blanket then will have direct contact with the printing surface and, in turn, the ink is printed. Photography films were used as plates. A computer-to-plate (CTP) system now exists to replace the much slower computer-to-film process.

i. Pre-Printing Process

Offset printing starts with the pre-printing process. Because PT. Kanisius already implemented the CTP system, the computer file (design file) that is going to be printed, is first broken down into CMYK (Cyan, Magenta, Yellow, Key/Black). Each color is represented by a TIFF file, so one image file should have four different TIFF input files required for CTP printing. After that the four TIFF files are injected into the CTP machine for printing, where the operator would only need to click the “Play” button in order for the process to start. This stage is critical because if a plate is broken or the operator printed the wrong file, then all the process afterwards is at risk. Note that CTP operators print the plates in accordance with the schedule given to him from JSA-PPIC department.

The CTP machine used by PT. Kanisius is Heidelberg Suprasetter, which was made in Germany. Figure 3.2 is the picture of the machine. It is quite new, being only a month old at the time of the internship and was acquired with a large amount of money. Every month, the machine is scheduled for a preventive maintenance, in which the machine is cleaned and checked thoroughly for imperfections.

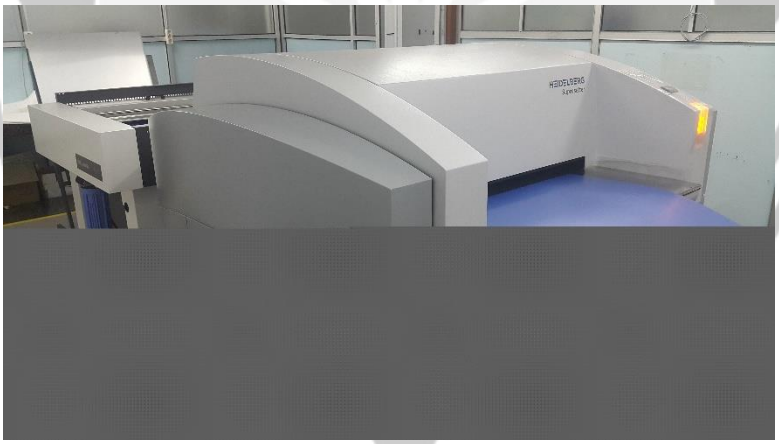


Figure 3.2. Computer-to-Plate Machine

A plate is inserted to the machine, where it will shoot lasers to the surface of the plate. The lasers are pre-configured so that it will follow the image from the TIFF files. Afterwards, the plate will go through a brief chemical bathing and a series of rubber rollers before an operator can pull it out. The process is repeated until a set of plates for that specific order are finished, in which they will be packed and sent to the logistics department using a cart.

There are two kinds of thermal plates used as raw materials for the CTP machines. The first is SM52 thermal plates, with a measurement of 52.5 cm x 45.9 cm. SM52 plates are the input for Speed Master offset machines. The second is called R204 thermal plates, with a measurement of 74.5 cm x 60.5 cm. Figure 3.3 is the picture of R204 material.

Figure 3.3. Raw Materials for CTP Machine

R204 plates are input for Rolland 2, Miller, and Rolland 4 offset machines. Figure 3.4 is the picture of the plate would look like when CTP machine is done doing its job.

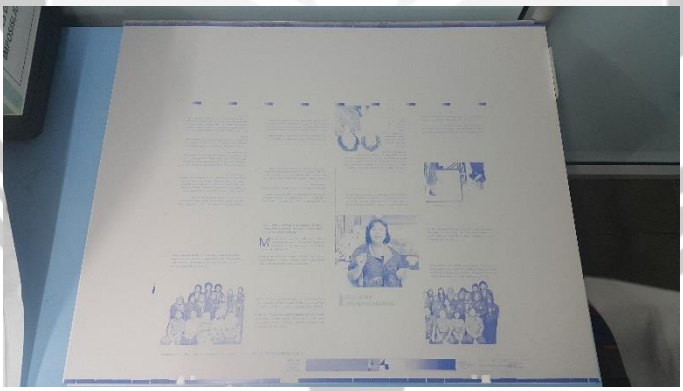


Figure 3.4Printed Plate from the CTP Machine

ii. Printing Process

There are five different offset machines located in the production floor, each with its own capabilities and specialties. Each machine has its own operators and production schedule, determined also by the JSA-PPIC department.

Figure 3.5 until 3.9 are the pictures of the offset printing machines. Continuing from the pre-printing process, the logistics department received the plates. The plates will stay there until the production schedule for that order comes up and due, where the printing department picks up the plate and put it inside

the corresponding machine prior to setting up the machine. Logistics department will start to cut the paper according for the order's job ticket and then deliver it to the printing department. When it arrives and the machine is idle, the printing process can begin immediately.

Figure 3.5.Rolland 2 Machine

Figure 3.6. Rolland 4 (Old) Printing Machine

Figure 3.7.Rolland 4 (New) Machine

Figure 3.8. Speed Master Printing Machine

Figure 3.9. Miller Printing Machine

Paper usage for printing depends on the order's job ticket, which contains the imposition set upon by the JSA-PPIC, and therefore the plate as the offset machine's input. One whole paper could contain up to 16 different pages

iii. Post-Printing Process

Figure 3.10 to 3.14 are some of the post printing machines that exist within the company. After the printing process is done, the printed papers are transferred to the post-printing department area; which is located just outside the printing area. Post-printing department handles the finishing step of the products and the process used depends entirely on customer's personal preference. Again, the order's job ticket issued from JSA which were first transferred from JSA – CTP – Logistics – Printing Dept is referred to.

Figure 3.10. Laminating Machine

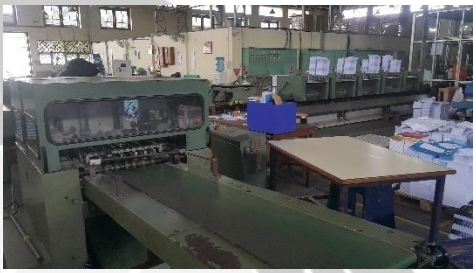


Figure 3.11. Wire Sewing Machine

Figure 3.12. MBO Folding Machine

Figure 3.13. Stahl Folding Machine

Figure 3.14.Polar Cutting Machine

There are three post printing types, thread binding (*jilid benang*), perfect binding, and wire binding. The three printing types are spread across the production floor and are divided into three zones; A, B, and C. There are no specific conditions for each zone because the location a product would end up entirely depends on availability of the machines.

b. Digital printing

Digital printing, or can also be called digital offset printing, has the same capabilities as a regular offset machine. However, the process of digital printing is much faster as it does not need a sophisticated pre-printing process such as plates and CTP. Thermal plates are unnecessary and instead replaced with a digital PDF file from a computer.

Figure 3.15 to 3.19 are the pictures of the machines used by the digital printing department. When a digital printing order comes in, the department will check the files given to them by the customers. Adjustments and improvements will be made so that the output will be compatible with what the customer's demands. Just like other departments, digital printing follows the production schedule given by JSA-PPIC. It procures the printing papers from the logistics department by filing a specific request form, and give it to logistics. Afterwards, the logistics will proceed to cut the papers according to the request form; its types, measurement, number of sheets, etc.

Figure 3.15.Color Printing Machine

Figure 3.16Printing Area for Digital Printing

Figure 3.17. Binding Machine

Figure 3.18. Wire Sewing Machine

Figure 3.19. Three Sides Cutting Machine

The digital printing department possesses its own post-printing department just next to the printing area, therefore is completely independent of the offset printing department. Again, the post printing process used depends entirely on customer's preferences and request.

CHAPTER 4

REVIEW OF STUDENT'S JOB ASSIGNMENT

Chapter 4 explains the job or work that was assigned to the student during the work practice period. Things such as responsibilities, work scope, work methodologies, and its result are detailed in this chapter.

4.1. Work Scope

During the work practice period, the student was assigned to two different departments to help with the process inside each of them. Originally, the assignment was only at the Logistics department. As it turns out, the CTP or Pre-Printing department required an extra pair of hands to operate the machine. So, the first two weeks, the student was assigned at the CTP department, and the last two weeks he moved back to the Logistics department.

Logistics department is responsible to make sure that the printing area, offset and digital, have their papers when it's time to print. This is also where the plates are stored temporarily before being delivered to the offset printing area. Therefore, CTP and Logistics are directly related and tied to each other. Without the plates, offset printing cannot operate and there would be no point to deliver the papers to them.

During the whole period of industrial practice, the student interacted and cooperated withcolleagues from the Logistics department, JSA-PPIC department, and CTP or Pre-Printing department.

a. Head of Logistics Department, Mr. Iwan
b. Logistics staffs; Mr. Doni, Mr. Peta, Mr. Bas
c. CTP unit staffs, Mr. Y. Eko and Mr. Kidi
d. Purchasing department, Ms. Yovita

4.2. Responsibility and Authority of Student

As explained before, the student was assigned to two different departments over the course of four weeks. In each department, the responsibilities of the student are different. Figure 4.1 until 4.6 are pictures of the warehouse and most of the things in it. In the first two weeks, assigned at the CTP department, the student's tasks are listed below:

a. Operate the CTP machine, as in inserting the plates into the machine.
b. Pull the finished plates from the machine and put it the table for packing.
c. Pack the finished plates for delivery to the Logistics department.
d. Label the pack according to the information contained in the job ticket.
e. Deliver the packed set of plates to the Logistics department.
f. Do a documentation of finished and deliver plates per order's job ticket.

Figure 4.1. Logistics Workstation

Figure 4.2. Order Bags (Job Tickets)

Figure 4.3. Material Handling Vehicle

Figure 4.4. Raw Materials Storage

Figure 4.5. Paper Cutting Machine

Figure 4.6. Papers that have been Cut

The remaining two weeks, the student was moved back to the logistics department. The tasks given were:

a. Write a documentation of each order's job ticket prior to paper cutting. The documentation would act as a guide for the cutting machine operator for him to retrieve the papers from the warehouse and then cut it

b. Help the cutting machine operator in performing his duties, such as preparing pallets to place recently cut papers
c. Document each cutting operation in Form D so that the supervisor knows how much papers are produced from each cutting in reference to a specific order
d. Deliver the paper that has been cut to the offset machines, respective to the production schedule
e. Move the plates from storage to the “ready-to-use” section near the printing department. This task is only performed if the order involves the use of offset machines.
f. Act as an administrator to input the data written in the logistics forms into three separate databases; stock card, sales and distribution system, and intranet system.
g. Evaluate and document every incoming raw material delivered by Kanisius’ suppliers.
h. Process each incoming raw material’s invoice with its respective purchase order (given by the purchasing department). This includes inputting the data into both sales and department system, and intranet system.
i. Deliver the processed incoming raw material documents to both purchasing department and finance department.

4.3. Work Methodology

This sub section will describe the methodology upon which the student performs his job. To make things simpler, each department’s workflow will be visualized using flowcharts. And the processes in which the student were involved, will be highlighted.

4.3.1. CTP Department

Figure 4.7 below represents the tasks done within the CTP department. Note that in the CTP room, there is only one person doing all the tasks. Because of this reason, the student was sent to the CTP room to help out with some of the tasks so that the main operator can focus on the computer to produce TIFF files necessary for plate printing.

When the TIFF file is ready, it would be fed to the CTP machine through a separate computer. This is where the student's assignment begins. The student must check whether or not enough plates are available in the room. If not, then he has to fill in a request form which would be sent to the logistics department. Soon after receiving the request form, logistics will send one staff to open the REPRO warehouse where the raw plates are located. The logistics staff will then deliver the plates to the CTP room manually.

After making sure that enough plates are available for printing, they are then inserted into the CTP machine one by one until each order's job ticket is fulfilled. After that the finished plates are packed and labelled, then delivered to the Logistics department using a cart.

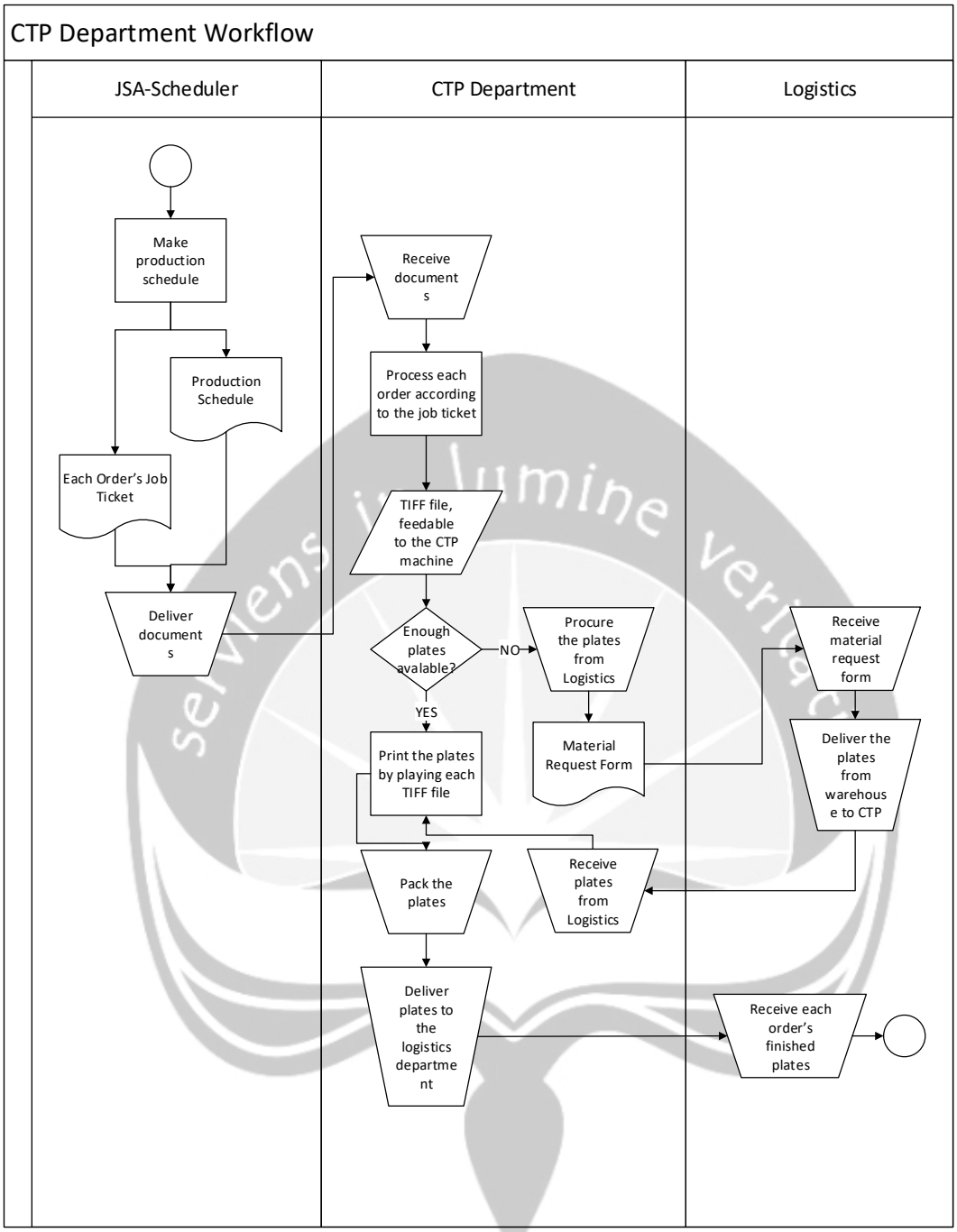


Figure 4.7. Business Process of CTP Department

4.3.1. Logistics Department

Within the logistics department, the student was assigned to perform tasks related to two different functions. The first one is the cutting process, second one is purchasing process. Note that the tasks related to those two functions were done independently of each other with no specific sequence, as raw materials could arrive at any time depending on the supplier and their shipment process.

Figure 4.8 below represents the business process of the logistics department, in particular, activities concerning paper cutting. Within the logistics department, the student's tasks are more variative compared to the CTP department. The cutting process can begin immediately after both the plates and job ticket are received. However, in reality, the order of which job ticket goes first and when highly depends on the production schedule released by the JSA-Scheduler and availability of the printing machine.

When the schedule for that specific order is due, the cutting process begins. The student first document the upcoming cutting process in M or MD form. The data from M or MD form are crucial to track how many papers are available and therefore, indirectly influence when the supervisor should buy them from suppliers. They have to be inputted into both the intranet database and sales and distribution database, which is also one of the student's routine task.

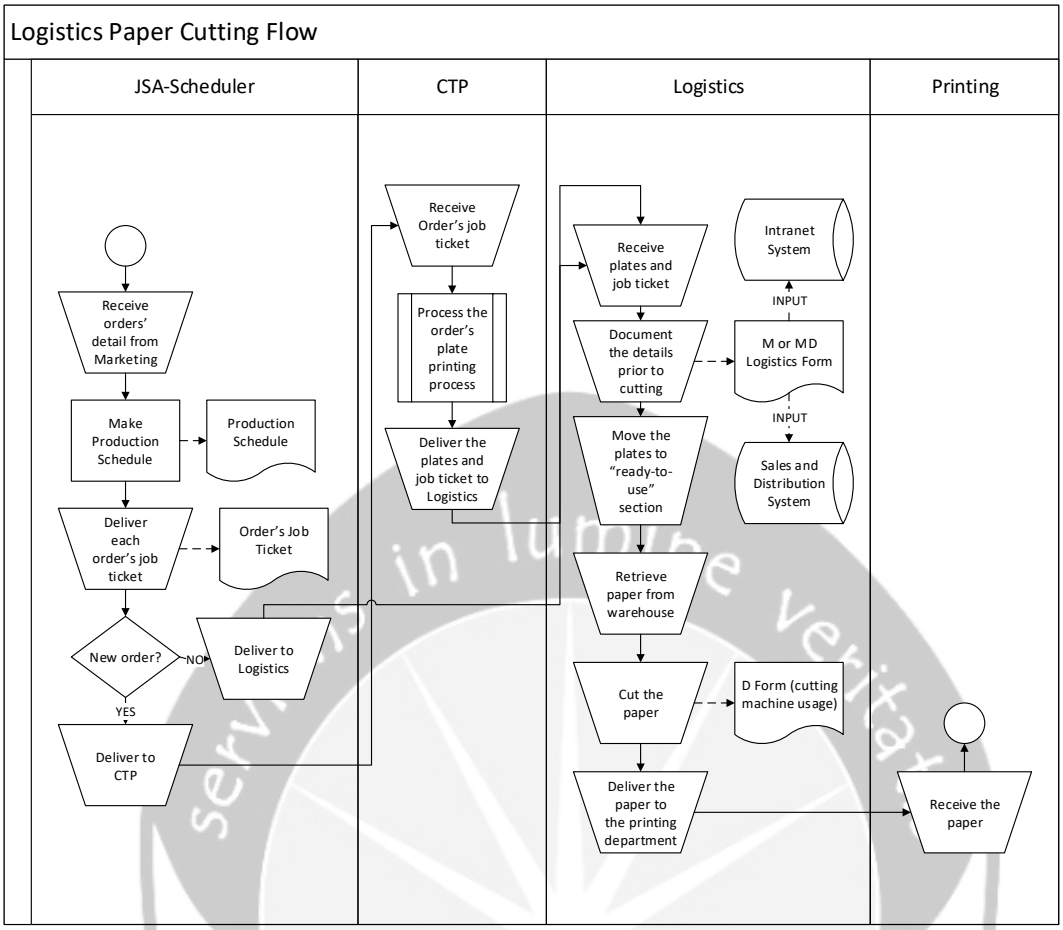


Figure 4.8. Business process of Logistics (Paper Cutting)

Afterwards, the job ticket is given to the cutting machine operator, who will retrieve the paper from the warehouse and cut it. Each cutting process has to be documented in D Form, which purpose is to record machine usage and how many papers each cutting process produces. The paper that has been cut then would be delivered to the printing department.

Figure 4.9 depicts the business process of the logistics department, in particular, the purchasing function. The purchasing process starts when the logistics supervisor makes a request for specific items to the purchasing department, who will then contact each item's respective supplier to make the order. A purchase order (PO) is then produced and given to the logistics department.

This purchase order would stay idle until the item mentioned within it has arrived. When the ordered items arrived, the student's task begins by filling an evaluation form and signing the delivery note given by the truck driver.

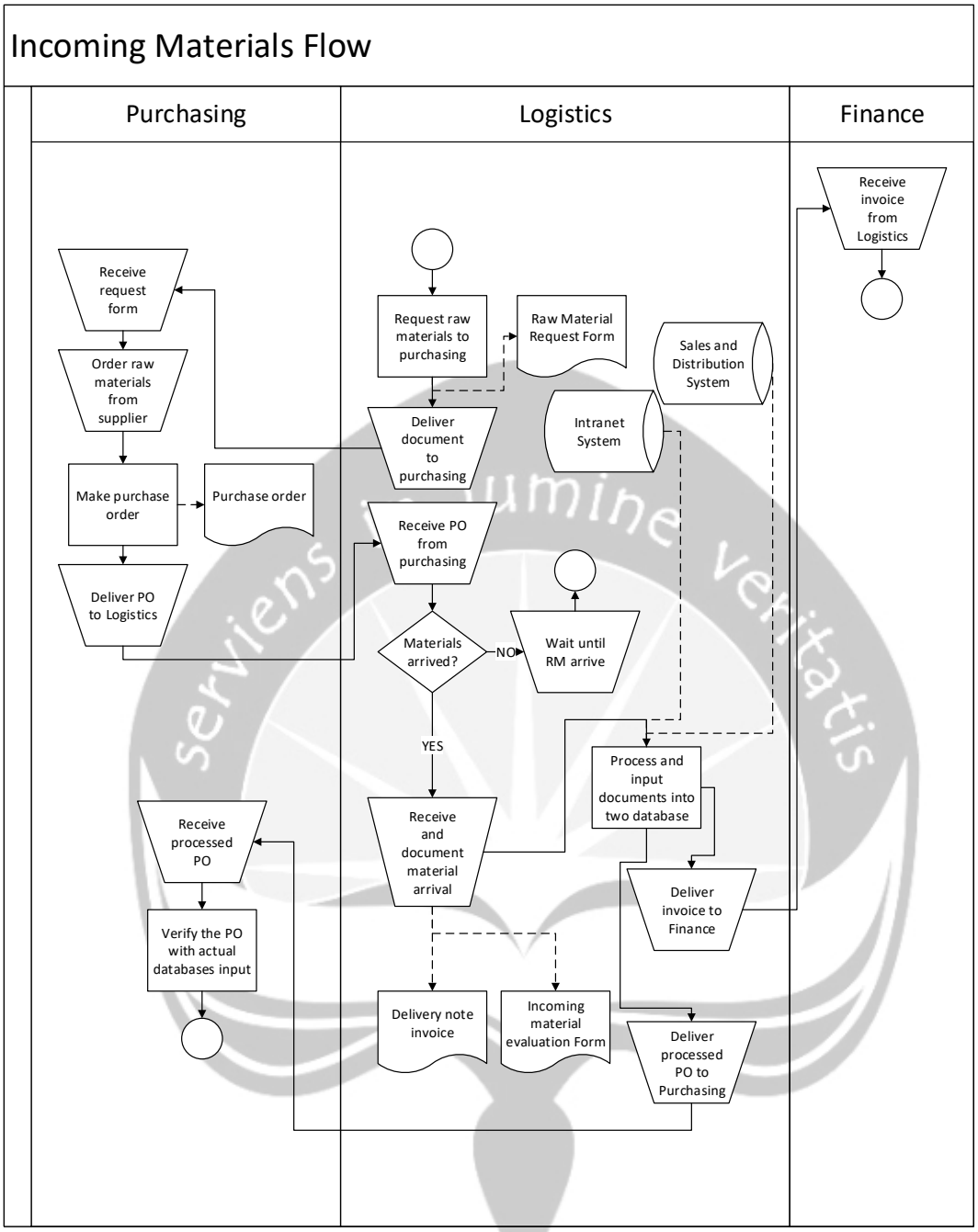


Figure 4.9. Business process of Logistics (Purchasing)

As mentioned before, material arrival will produce two different documents; evaluation form and delivery note. Those two, in combination with the purchase order for that respective item have to be processed by the student so that goods invoice could be generated. The data contained within the three aforementioned documents have to be inputted into two different databases; sales and distribution system and intranet system.

The input process will produce two new documents; processed PO and order invoice. The processed PO along with the original delivery note have to be delivered back to purchasing department. Whereas the invoice must be sent to the Finance department.

4.4. Work Result

This section will explain of the job and tasks given to the student, focusing on its importance and impact on the production process as a whole.

4.4.1. CTP Department

The work done within the CTP department is crucial to the whole production process, especially the scheduling results. Any delay that happened here, may set the schedule way far off. Even though the tasks seem trivial and repetitive, the plates produced here are extremely important piece of raw materials needed for offset printing. Plate printing is also the longest process out of other production steps in paper printing and publishing, limited by the machine's maximum output of 16 plates per hour.

The student's assignment to the department helps in achieving the target output. Every time the plate passed through the laser-shooting process, another plate must be inserted immediately to save time and achieve maximum efficiency. In other words, idle time of the CTP machine must be close to none at all if possible. So, the student did just that. Before the student was assigned there, only one person was in charge of the CTP department. He had to produce the TIFF files (which sometimes can be very complicated), play the program, insert the plates, etc., all by himself.

Speedy processing time enabled the production schedule to be properly executed, therefore making sure every customer's order can be finished on time.

4.4.2. Logistics Department

As mentioned in the previous chapters, the student was given various tasks within the logistics department. But generally, the tasks could be divided by two types, those concerning the paper cutting process, and the rest concerning the purchasing process.

The result of the student's task is a speedy input of the cutting data into three different databases. First database is stock card, an important piece of

documents which purpose is to track the remaining amount of papers that the department possess. Second database is the sales & distribution system, which functions as a way to track how much is the money value of the papers that were used for a specific order. Third database is referred to as the intranet system, which in turn would be processed by the calculation department for preparation and visualization.

4.5. Failures Mode Effects Analysis (FMEA)

Aside from the tasks given to the student by the company, the student's lecturer also gave the student a freedom to choose and make a mini project which will act as a feedback from the student to the company. This way, both parties (student and the company) receives feedback and benefited from each other. Figure 4.10 is the methodology of how the analysis will be conducted.

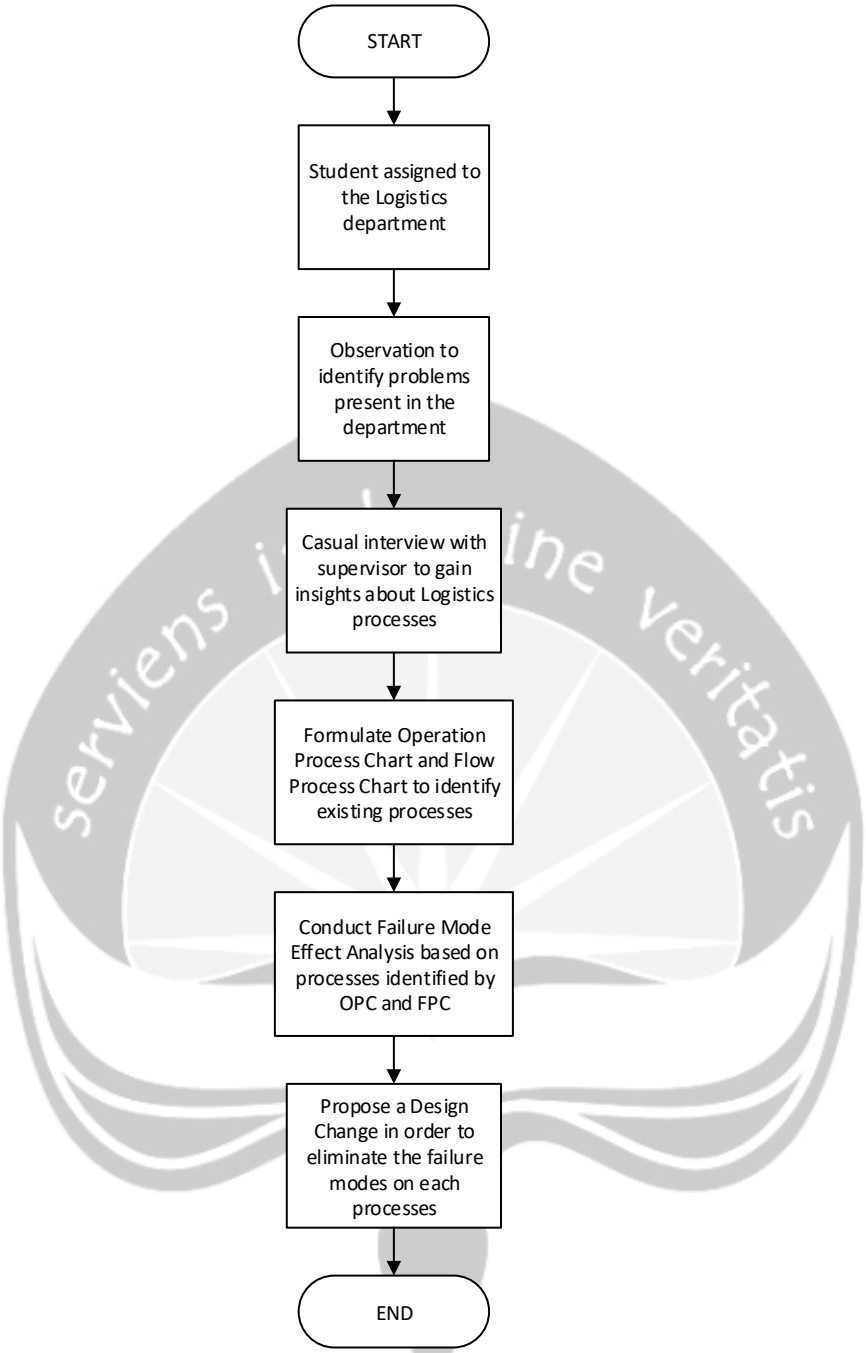


Figure 4.10. Methodology of the FMEA for Logistics Department

In this internship report, Failure Mode Effects Analysis was done to the Logistics department of the company. During the internship period, there were many failures or potential failures within the logistics department; many of which may or may not cause serious harm to the company's operations. The analysis is necessary to assess the extent of the failures' damage and how best to prevent them from happening again.

Failure mode and effects analysis is an engineering technique which function is to identify, define, and eliminate known and/or potential failures in a design, process, or system before they reach the customer (Omdahl, 1988). The output of FMEA is to identify corrective actions required to prevent failures from happening, assuring the best quality, durability, and reliability in a product or service (Stamatis, 2003).

The idea of FMEA is to first identify the failures that might happen within a process or equipment. The failures are assigned a severity score based on how it impacts overall company operation (S), with a scale starting from 1 which means that it has minimal impact, up until 10 which has the most severe consequences. After that, the failures are further analyzed to find its root causes, upon which a probability score will be assigned based on its likeness to occur (O), again using scale of 1-10, with 1 means it almost never occurred until 10 which means the cause always occurs. Identification of existing process control or indicator to detect the failures before occurring is then conducted, in which detectability score will be assigned (D), also using 1-10 scale. 1 means it is easily detected, whereas 10 means it is extremely hard to detect(Mikulak, McDermott, & Beauregard, 2008).

The three scores will produce the risk priority number (RPN). The score is then used as a reference upon which failure modes are ranked, starting from the highest to the lowest RPN.

$$RPN = Severity\ Score \times Occurence\ Score \times Detectability\ Score \quad (4.1)$$

Obviously, failure modes which possess high RPN would be attended first, whereas the others may or may not be attended depending on the company's specifications.(Mikulak, McDermott, & Beauregard, 2008).

FMEA however, does not stop there. An action or actions must be taken afterwards based on the details that FMEA itself has gathered, which seeks to eliminate the failure mode altogether if situation permits it. In case that eliminating the failure mode itself is impossible, then the formulated action must reduce either one of the three main scores that form the RPN. The most effective approach would be the action to reduce either the occurrence or severity score as low as possible. Because reducing merely the detection score would only

increase the chance that the failures are going to be detected after it happened.(Mikulak, McDermott, & Beauregard, 2008)

There are several types of FMEA depending on company's needs, however in this report Process FMEA will be used to identify failures and how best to eliminate them altogether, if possible. A process FMEA begins with identifying the processes that we wish to apply FMEA on. For a manufacturing company, operation process chart that depicts the assembly process can be utilized. However, operation process chart has limited capability as it only shows value-added processes, excluding material handling or arrival; both of which are crucial activities in within the Logistics Department. Therefore, a material flow process chart is also made to identify extra processes which exists in Logistics.

Figure 4.11 depicts the operation process chart of a typical offset printing order, a regular book with contents and cover. Note that there is no cycle time for each process, this is because every order would need different amount of time on each process depending on the customer's demands. The main parts are cover paper, content paper, and plates. Content papers, which usually are bookpaper or HVS papers, are first cut according to the job ticket and then checked. After that, it is sent to the printing department along with the cover paper, usually art paper or matt paper. Printing either cover or content would require the use of plates, as they utilize mass printing offset machines as opposed to regular printers.

As soon as both cover and content papers have finished being printed, they are sent to post printing area where finishing are done. They are assembled into one book by using the book binding machines available in the area. Which machine would be used entirely depends on customer's preference as there are many binding techniques that can be used.

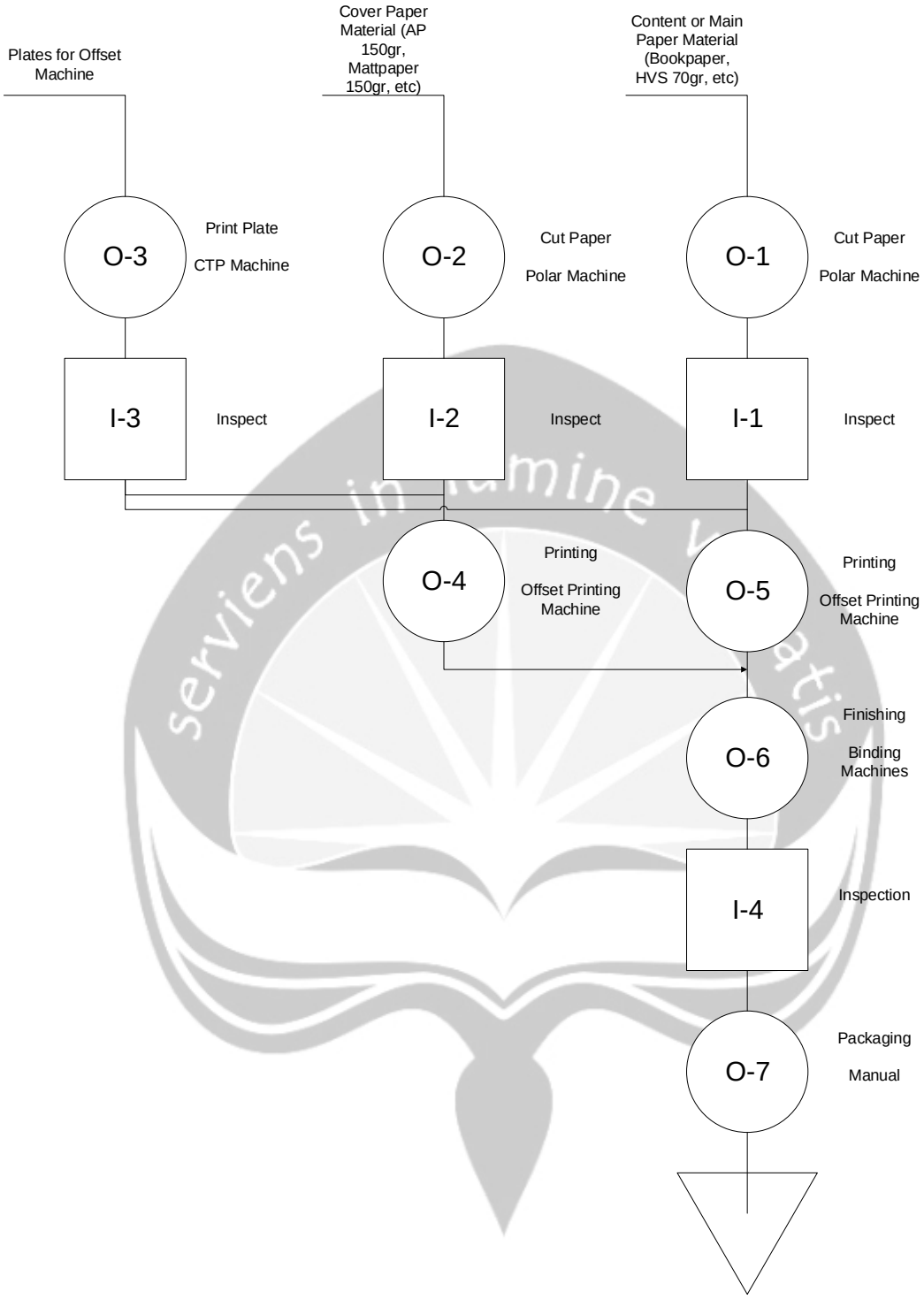


Figure 4.11. Operation Process Chart of a typical Offset Printing Order

Figure 4.12 is the material (papers) flow process chart starting from papers delivery from supplier until it is finally delivered to the printing department. The chart is made this way because paper was the material of which the student

interacted the most. Also, it acts as a complement to the operating process chart because OPC lacks the information of material handling and delivery.

Material movement starts with the transportation from supplier to PT. Kanisius' warehouse, after which they are inspected by the warehouse staff using the material receiving form. Then they wait for an order to come through which specifically uses them, because there are many types of papers. Should such an order come in, operator will move said paper to the cutting area. Cutting process can begin immediately after. Operator will inspect the result of the cutting process for a while before delivering the papers to the printing department using a handcart.

Material: Papers	**Date: 04/11/2018**				
	Analyst: Nicholas Indra PS				
	PROCESS SYMBOLS				
PROCESS DESCRIPTION	***Operatio***	***Movement***	***Inspection***	***Delay***	***Storage***
Papers are delivered to PT. Kanisius					
Inspected by warehouse staff					
Wait for manufacturing order to come					
Papers moved to the cutting area					
Papers are cut according to the specifications					
Inspected by the cutting operator					
Moved to the offset printing area					
Papers are fed to the printing machine					
Moved to the finishing area					
Binded to make a proper book					
Moved to the Finished Goods warehouse, waiting for delivery					

Figure 4.12. Material (Papers)Flow Process Chart

The failure mode effects analysis is done to each activity or process that were conducted in the Logistics department, with the help of flow process chart and operation process chart. Only the Logistics department's activitiesare analyzed because that is where the student was involved the most. Each activity is then analyzed for potential failures that might happen along with its most severe consequences. Full table of the Failure Mode Effect Analysis can be looked up on Appendix 1 of this report. The detailed explanation based on the failure modes is as follows:

a. Incorrect Type of Paper were Cut (Paper Cutting Process)

   In the logistics department, one of the core processes is the cutting phase. This process is critical to the production process as a whole because it serves as the basis for the main product. Customers have full control of what type of paper that they want to use for their respective products.

   The first potential failure mode for the cutting process is where the wrong type of papers was cut instead. Figure 4.13 depicts the failure mode along with its consequences. So, for example, Bookpaper was cut instead of HVS. Although not fatal, this failure would drive the whole production schedule backwards, potentially missing deadline and causing customer dissatisfaction.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
Incorrect type of paper were cut	Cutting process have to be repeated from the beginning	8

Figure 4.13. First Failure Mode of the Cutting Process

   For this reason, the severity score is 8. Severity score of 8 would mean the halt and shutdown of the whole production process, particularly the one for a specific customer's order(Mikulak, McDermott, & Beauregard, 2008).

Because the papers were of the wrong type, the cutting process basically have to be restarted from the beginning.

Root cause for this failure can be identified by using the fishbone diagram depicted in Figure 4.14. Root causes may be more than one for each potential failure, as every root cause can be assigned a different occurrence score.

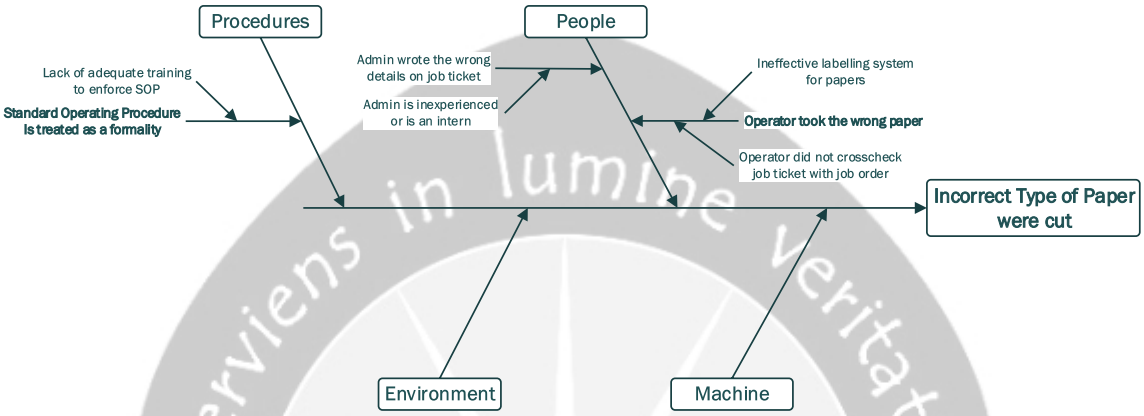


Figure 4.14. Fishbone diagram for Incorrect type of paper cut failure

Four root cases were generated from the diagram, each with their own occurrence score. From here on out, the failure mode then branches out, producing different occurrence score and detectability score. The root causes would be analyzed to generate a process control or indicator, if they already exist within the company. Process control functions to detect the root cause before it happened, so as to prevent it. Figure 4.15 is the snapshot of the root causes for the first failure mode with their occurrence scores. Identified process controls are also presented in the figure.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Lack of adequate training to enforce SOP	4	Employee performance evaluation is done every 3 months	4
b) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	2
c) Ineffective labelling system of papers	2	Labelling is only done on the front side of material pallet	2
d) Operator did not crosscheck job ticket with order details	2	Two operators are always present to do cutting process so that each can check up on the other	2

Figure 4.15. Snapshot of Root Causes and Process Control for the first failure mode

The occurrence score of 4 means that the likelihood a failure would occur due to a root cause is moderate; whereas an occurrence score of 2 means the likelihood is categorized as low. Process control has a tremendous impact towards the occurrence score as a good process control would most likely reduce occurrence score to either low or very low. Detectability score of 4 signifies that likelihood of detection is moderately high and may be detected prior to design freeze (Mikulak, McDermott, & Beauregard, 2008).

Since the failure mode branches out into four different root causes and process controls, there will be four different risk priority number (RPN) assigned to this failure mode. Figure 4.16 presents the RPN of each root causes, for the first failure mode.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
Incorrect type of paper were cut	a) Lack of adequate training to enforce SOP	128
	b) Admin is inexperienced or is an intern	32
	c) Ineffective labelling system of papers	32
	d) Operator did not crosscheck job ticket with order details	32

Figure 4.16. Snapshot of the Risk Priority Number of the first failure mode

b. Papers Cut have incorrect dimensions (Paper Cutting Process)

The second potential failure mode for paper cutting process is the resulting papers to have incorrect dimension compared to what the customer demands.

Consequences of this failure would be the repeat of the cutting process depending on how many papers were out of specification. But the effect is severe enough to earn it a severity score of 8. According to the theory, severity score of 8 means the major disruption of the production process as a whole since 100% of the freshly cut papers have to be scrapped. Cutting process, therefore, would have to start from the beginning. Figure 4.17 is the table depicting the second failure mode for the cutting process.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
Papers cut have incorrect dimension (length or width)	Extra papers have to be cut to accommodate the incorrect ones	8

Figure 4.17. Second Failure Mode of the Cutting Process

Figure 4.18 describes the root cause analysis for the failure mode. Turns out that only two major components contribute to the failure mode, machine and people. In total, four root causes were identified by using the fishbone diagram.

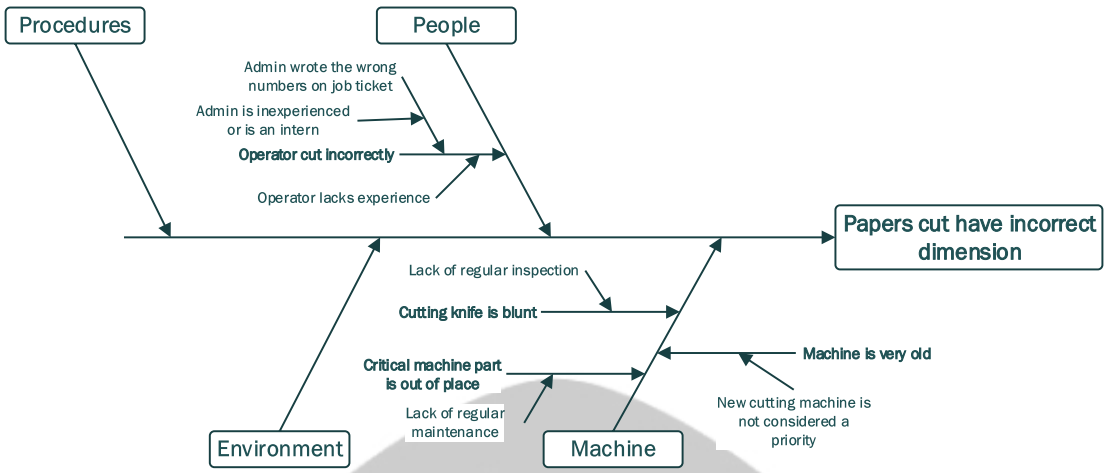


Figure 4.18. Fishbone diagram for the second failure mode of cutting process

Figure 4.19 lists the root cause and its process controls. The occurrence score of 2, 1, and 3 means that the likelihood of the failure to occur due to a root cause are Low, Very Low, and Low respectively. Occurrence score of 1 specifically means that the failure mode is eliminated through preventive control. Detectability score of 4, 3, 2, and 7 means that the likelihood for the failure to be detected are Moderately High, High, Very High, and Very Low (Mikulak, McDermott, & Beauregard, 2008). An annual review is simply not enough to review machine capability. This would mean that machine replacement is impossible prior to annual review.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	4
b) Operator lacks experience	1	A new operator is constantly supervised until he is skilled enough	2
c) Lack of regular inspection on the cutting machine	3	Operator checks the machine's condition before use every week	3
d) New cutting machine is not considered a priority	1	Machines condition and capability are reviewed every year	7

Figure 4.19. Snapshot of the root causes and process control of the second failure mode

After both the occurrence and detectability score are identified, risk priority number for the failure mode and each of the root causes can be calculated. RPN would eventually decide whether or not a corrective action should be taken to address the failure mode. Figure 4.20 is the snapshot of RPN of each root causes.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
Papers cut have incorrect dimension (length or width)	a) Admin is inexperienced or is an intern	64
	b) Operator lacks experience	16
	c) Lack of regular inspection on the cutting machine	72
	d) New cutting machine is not considered a priority	56

Figure 4.20. Snapshot of the RPN for the second failure mode

c. Insufficient amount of papers was cut (Paper Cutting Process)

The third potential failure mode for the paper cutting process is when it fails to cut enough papers for a specific order. In other words, papers cut turns out to be less than required. Figure 4.21 depicts the failure mode along with its consequence.

This failure mode's main consequence is pushing the production schedule backwards because additional time is wasted on cutting extra papers, preventing key priority orders to be finished as soon as possible. Severity score is given 7, meaning it is a significant disruption of the manufacturing process (Mikulak, McDermott, & Beauregard, 2008). The manufacturing speed is lowered due to the delay in the cutting process, delaying the whole production schedule.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
Insufficient amount of papers were cut	Additional time is wasted on cutting additional papers	7

Figure 4.21. Third Failure Mode of the Cutting Process

There are many root causes for this particular failure mode. Figure 4.22 provides a complete picture of the analysis. The root cause is then further analyzed whether or not a process control already existed to prevent them.

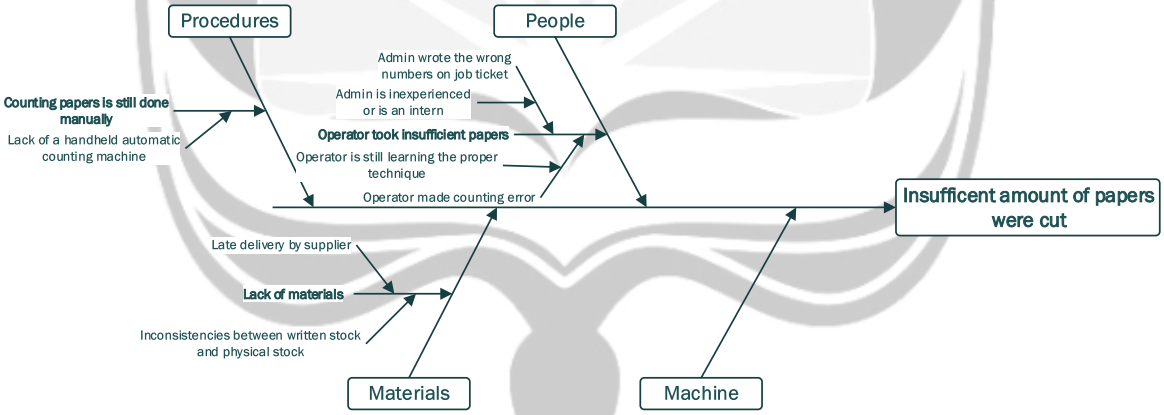


Figure 4.22. Fishbone diagram for the third failure mode of the cutting process

Figure 4.23 depicts both the root causes and process controls for the third failure mode. The occurrence score of 2, 5, 7, and 9 means that the likelihood of the failures to occur through each root causes are Low, Moderate, and High respectively. Both 7 and 9 are located in the same category of High likelihood. Detectability score of 3, 2, and 1 means High, Very High, and Almost Certain respectively (Mikulak, McDermott, & Beauregard, 2008). Even though process control does have an effect towards the occurrence score,

the effectiveness of which the process control must also be counted in as an important factor. For example, even though supplier performance is monitored constantly, there is little to nothing that purchasing department could have done to reduce the occurrence. Except maybe calling the supplier themselves and file a complaint.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Admin is inexperienced or is an intern	2	Paper counting is done two times, when it was first taken from warehouse and second is when it's about to be cut	3
b) Operator is still learning the proper technique to count papers	2	A new operator is constantly supervised until he is skilled enough	2
c) Lack of a handheld automatic counting machine	5	Tools condition and capability are reviewed every year	3
d) Late delivery by supplier	7	Supplier performance is monitored and reviewed constantly by purchasing department	1
e) Inconsistencies between written stock and physical stock	9	Stock opname is done once a month	1

Figure 4.23. Snapshot of the root causes and process control of the third failure mode of the cutting process

Occurrence and detectability score of each root causes are then multiplied by the severity score determined before. Figure 4.24 is the RPN for each root causes, for this particular failure mode.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
Insufficient amount of papers were cut	a) Admin is inexperienced or is an intern	42
	b) Operator is still learning the proper technique to count papers	28
	c) Lack of a handheld automatic counting machine	105
	d) Late delivery by supplier	49
	e) Inconsistencies between written stock and physical stock	63

Figure 4.24. Snapshot of the RPN for the third failure mode

d. Delivery to the Printing Department is delayed (Paper Delivery to the Printing Dept Process)

Paper delivery to the printing department is a process that is done almost every day within the Logistics department. Although both departments are located very close to each other, does not meant that the deliveries are always smooth and without problems. Failure mode for this process is when the delivery for the printing department is delayed. Figure 4.25 depicts failure mode along with its consequence.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
Delivery to the printing dept is behind schedule	Printing machine is idle and schedule is delayed	8

Figure 4.25.Failure Mode of the Paper Delivery Process

As a consequence, printing machine is unable to operate without papers, impacting production schedule. Severity score is 8 as it halts production process completely, categorized as a major disruption to the manufacturing process(Mikulak, McDermott, & Beauregard, 2008). Delayed schedule could potentially lead to late order fulfillment, reducing customer satisfaction and loyalty to the company itself.

Figure 4.26 is the fishbone diagram to identify the root causes of this failure mode. Turns out that only three major components contribute to the failure mode, procedures, materials and machine. In total, four root causes were identified by using the fishbone diagram. The company is then identified much further to discover the existence or non-existence of process controls or indicator which functions to prevent the root causes from occurring. Figure 4.27 is a snapshot of the resulting analysis.

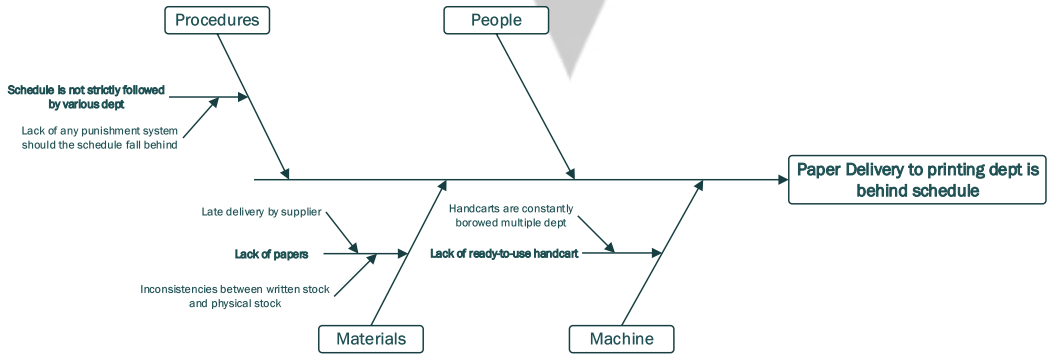


Figure 4.26. Fishbone diagram for the Failure Mode of the Paper Delivery Process

Figure 4.26 is the fishbone diagram to identify the root causes of this failure mode. Turns out that only three major components contribute to the failure mode, procedures, materials and machine. In total, four root causes were identified by using the fishbone diagram. The company is then identified much further to discover the existence or non-existence of process controls or indicator which functions to prevent the root causes from occurring.

Figure 4.27 is a snapshot of the resulting analysis. Occurrence score of 8, 7, 9, and 1 means that the likelihood of the failure mode to occur through the root causes are High and Very Low respectively. Detectability score of 4, 7, and 1 means that the likelihood of failure mode being detected prior to occurring are Moderately High, Very Low, and Almost Certain (Mikulak, McDermott, & Beauregard, 2008). Stock opname is very effective in detecting differences between written stock and actual physical stock, however due to the fact that there are multiple databases that were not managed very well, such differences continue to exist until now.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Handcarts are constantly moving through multiple departments	8	Just before cutting process is finished, one operator is on the lookout of a handcart	4
b) Lack of any punishment system should the schedule fall behind	1	SOP is being reviewed once a year	7
c) Late delivery by supplier	7	Purchasing department regularly checks in with logistics about incoming materials	1
d) Inconsistencies between written stock and physical stock	9	Stock opname is done once a month	1

Figure 4.27. Snapshot of the root causes and process control of the Failure Mode of the Paper Delivery Process

Occurrence and detectability score are then multiplied by the severity score of the failure mode. The resulting number would be the risk priority number (RPN). Figure 4.28 is the RPN for each root causes for this particular failure mode.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
Delivery to the printing dept is behind schedule	a) Handcarts are constantly moving through multiple departments	256
	b) Lack of any punishment system should the schedule fall behind	80
	c) Late delivery by supplier	56
	d) Inconsistencies between written stock and physical stock	72

Figure 4.28. Snapshot of the risk priority number for the Failure Mode of the Paper Delivery Process

e. SOP for filling material receiving form is not thoroughly followed (Materials Receiving Process)

Another important process that exists within the Logistics department is materials receiving process. For this particular activity, purchasing department is also involved as they are the one who made the order and processed the invoices. Regardless, logistics department's role is quite crucial to make sure that the materials arrived are of good quality and in the right quantity. Figure 4.29 depicts the failure mode and its consequence.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
SOP for filling material receiving form was not followed thoroughly	Defective and imperfect material might be overlooked	8

Figure 4.29. Failure Mode of the Material Receiving Process

The failure mode for material receiving process is when the SOP for filling the material receiving form were not followed thoroughly. The form contains checklist that basically functions to make sure that every material arriving possess good quality and in the right quantity. To overlook the SOP would mean that defective raw materials may not be detected and missed. Severity score is 6, as defective material that is discovered just when the production process is about to begin would lead to a moderate disruption to the manufacturing process; where a portion of the production yield may have to be reworked due to the low quality(Mikulak, McDermott, & Beauregard, 2008).

Figure 4.30 is the fishbone diagram used to identify the root causes of the failure mode. Turns out that only two major components contribute to the failure mode, procedures and people. In total, four root causes were identified by using the fishbone diagram. Figure 4.31 presents the root causes and existing process control.

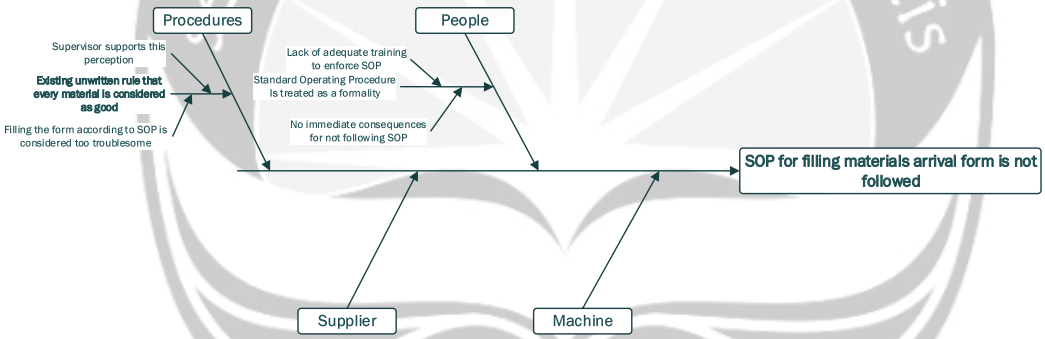


Figure 4.30. Fishbone diagram for the Failure Mode of the Material Receiving Process

Figure 4.30 is the fishbone diagram used to identify the root causes of the failure mode. Turns out that only two major components contribute to the failure mode, procedures and people. In total, four root causes were identified by using the fishbone diagram.

Figure 4.31 presents the root causes and existing process control.The occurrence score of 9 and 10 means that the likelihood for the failure to happen through the root causes are High and Very High. Detectability score of 4, 8, and 10 means that the likelihood for the failure mode to be detected through each root causes are Moderately High, Remote, and Almost Impossible (Mikulak, McDermott, & Beauregard, 2008). A detectability score

of 10 is given because no controls exist to prevent the failure mode from occurring.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Lack of adequate training to enforce SOP	9	Employee performance evaluation is done every 3 months	4
b) No immediate consequences for not following SOP	9	SOP is being reviewed once a year	8
c) Filling the form according to SOP is considered too troublesome	10	No control exists as of now	10
d) Supervisor supports the perception that every material is considered of good quality	10	No control exists as of now	10

Figure 4.31. Snapshot of the root causes and process control of the Failure Mode of the Material Receiving Process

The occurrence score and detectability score are then multiplied with the severity score of the failure mode. Figure 4.32 lists the risk priority number for this particular failure mode, based on each root causes generated.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
SOP for filling material receiving form was not followed thoroughly	a) Lack of adequate training to enforce SOP	216
	b) No immediate consequences for not following SOP	432
	c) Filling the form according to SOP is considered too troublesome	600
	d) Supervisor supports the perception that every material is considered of good quality	600

Figure 4.32. Snapshot of the risk priority number for the Failure Mode of the Material Receiving Process

f. Incorrect Paper Usage Details were inputted into the system (Administration Process)

Every paper usage is put into three different databases, sales and distribution (computerized), intranet system (computerized), and stock book for each paper type. All of them are crucial steps to keep track of how many papers do they have left and to transfer that information to finance departments. Figure 4.33 describes the failure mode and its consequence.

Failure Mode (On what condition the process can be classified as failed?)	Consequences	Severity (S)
Incorrect paper usage details were inputted into the database	Calculations done by the Finance department would be inaccurate	9

Figure 4.33. Failure Mode of the Administration Process

Failure mode for this process would be if the administrator inputs the wrong details into the databases. The consequences could reach finance department, as they would inevitably have the wrong calculation results. Which may or may not affects major decision-making process. Severity score is given 9. Although the effect is not apparent immediately, the high severity score is justified because it would directly have an effect towards the pricing system. Being a make to order company, pricing differs from one order to another; and are completely dependent upon how much money are invested into a customer's order. If the operator entered the wrong details of paper usage, finance calculations might be affected and causes the price to be lower than it is supposed to be.

Figure 4.34 represents the fishbone diagram utilized to identify the root causes of the failure mode. Turns out that only two major components contribute to the failure mode, procedures and people. In total, only two root causes were identified by using the fishbone diagram.

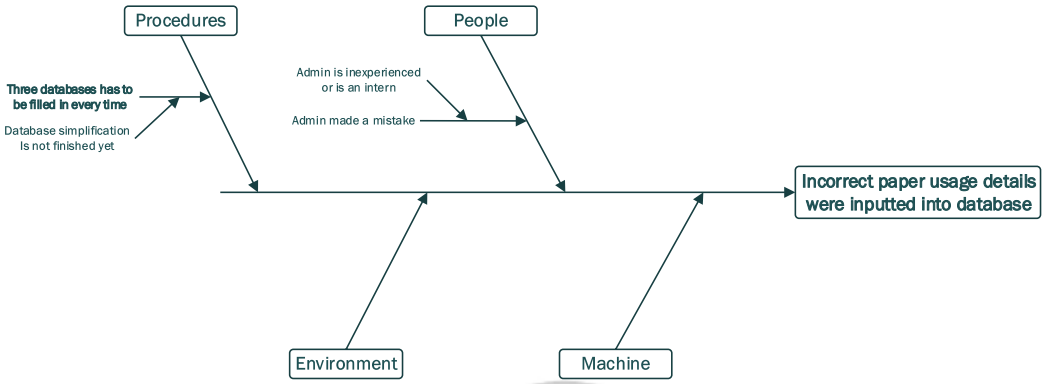


Figure 4.34. Fishbone diagram for the Failure Mode of the Administration Process

Figure 4.35. lists the root causes and the process controls that exists to detect them. The occurrence score of 10 and 2 means that the chance of the failure to occur through the root causes are Very High and Low. Detectability score of 3 and 2, on the other hand, means that the chance of the failure being detected prior to its occurrence are High and Very High respectively (Mikulak, McDermott, & Beauregard, 2008). Since database simplification is still on-progress and won't be implemented until 2019, the occurrence is still very high for this particular failure mode.

Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)
a) Database simplification Is not finished yet	10	Supervisor cross-checks the data written on multiple databases everyday to make sure every input is correct	3
b) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	2

Figure 4.35. Snapshot of the root causes and process control of the Failure Mode of the Administration Process

After the occurrence score and detectability score are identified, RPN can be calculated by multiplying those scores with severity score of the failure mode. Figure 4.36 lists the RPN of the failure mode, according to each root causes.

Failure Mode (On what condition the process can be classified as failed?)	Root Causes	Risk Priority Number
Incorrect paper usage details were inputted into the database	a) Database simplification Is not finished yet	270
	b) Admin is inexperienced or is an intern	36

Figure 4.36. Snapshot of the risk priority number for the Failure Mode of the Administration Process

After the risk priority number has been identified for each failure mode, it is important for them to be prioritized by ranking them in order. The purpose is to determine which failure mode has the most impact towards the company's operation. Besides, working on all failure modes would prove too much work for a company as big as PT. Kanisius. Figure 4.37 is the RPNs of all the root causes and failure modes sorted from the highest to the lowest.

PROCESS	FAILURE MODES	ROOT CAUSES	RPN
Materials Receiving Process	SOP for filling material receiving form was not followed thoroughly	c) Filling the form according to SOP is considered too troublesome	600
Materials Receiving Process	SOP for filling material receiving form was not followed thoroughly	d) Supervisor supports the perception that every material is considered of good quality	600
Materials Receiving Process	SOP for filling material receiving form was not followed thoroughly	b) No immediate consequencesfor not following SOP	432
Administration Process (Data Input)	Incorrect paper usage details were inputted into the database	a) Database simplificationIs not finished yet	270
Paper Delivery to Printing_Dept. Process	Delivery to the printing dept is behind schedule	a) Handcarts are constantlymoving through multiple departments	256
Materials Receiving Process	SOP for filling material receiving form was not followed thoroughly	a) Lack of adequate trainingto enforce SOP	216
Paper Cutting Process	Incorrect type of paper were cut	a) Lack of adequate training to enforce SOP	128
Paper Cutting Process	Insufficient amount of papers were cut	c) Lack of a handheld automaticcounting machine	105
Paper Cutting Process	Papers cut have incorrect dimension (length or width)	c) Lack of regular inspection on the cutting machine	72
Paper Delivery to Printing_Dept. Process	Delivery to the printing dept is behind schedule	d) Inconsistencies between written stock and physical stock	72
Paper Cutting Process	Papers cut have incorrect dimension (length or width)	a) Admin is inexperienced or is an intern	64
Paper Cutting Process	Insufficient amount of papers were cut	e) Inconsistencies between written stock and physical stock	63
Paper Cutting Process	Papers cut have incorrect dimension (length or width)	d) New cutting machine is not considered a priority	56
Paper Delivery to Printing_Dept. Process	Delivery to the printing dept is behind schedule	b) Lack of any punishment system should the schedule fall behind	56
Paper Delivery to Printing_Dept. Process	Delivery to the printing dept is behind schedule	c) Late delivery by supplier	56
Paper Cutting Process	Insufficient amount of papers were cut	d) Late delivery by supplier	49
Paper Cutting Process	Insufficient amount of papers were cut	a) Admin is inexperienced or is an intern	42
Administration Process (Data Input)	Incorrect paper usage details were inputted into the database	b) Admin is inexperienced or is an intern	36
Paper Cutting Process	Incorrect type of paper were cut	b) Admin is inexperienced or is an intern	32
Paper Cutting Process	Incorrect type of paper were cut	c) Ineffective labelling system of papers	32
Paper Cutting Process	Incorrect type of paper were cut	d) Operator did not crosscheck job ticket with order details	32
Paper Cutting Process	Insufficient amount of papers were cut	b) Operator is still learning the proper technique to count papers	28
Paper Cutting Process	Papers cut have incorrect dimension (length or width)	b) Operator lacks experience	16

Figure 4.37. Snapshot of the risk priority number sorted from highest to lowest

The best possible course of action would be to propose a design change for each of the failure mode and root causes. However, such method would be too complex and takes too much time. Instead, a design change would be proposed to each one of the four processes that was identified; addressing the failure mode possessing the highest RPN. Hopefully, the company can consider them to be implemented within foreseeable future.

For the paper cutting process, the highest RPN is located on the failure mode where incorrect paper was cut; with its root cause being lack of adequate training to enforce SOP. The design change for this failure mode would be aimed to eliminate the root cause altogether, therefore reducing the occurrence score close to zero. Trainings to increase awareness and importance of SOP should be done to eventually build SOP-oriented company culture. Employees should be made aware about how important SOP is both for the company and them. SOP keeps the company running and its employees safe from harm. Not to mention that the ISO certification which the company possess was received due to the existence of said SOP. If they are only written on paper would be meaningless.

As for the paper delivery process, the highest RPN is on the delivery being made behind schedule failure mode, with its root cause being handcarts constantly moving through multiple departments. Unlike finished goods storage warehouse, Logistics department does not possess its own dedicated handcart. Instead, Logistics' handcart is always being borrowed by employees from various departments. Most often, a machine operator would need to scout the whole production floor to search for the handcart before he could deliver the papers to the printing department. The proposed design change would be the purchase of a dedicated handcart belonging solely to Logistics department, and its old counterpart would act as a mobile handcart that can be used by departments which does not possess one.

Materials receiving process's highest RPN is owned by the SOP for filling material receiving form was not followed thoroughly failure mode, with two root causes. This failure mode is apparent in the everyday operation of the company. Staff only checks out the boxes within the form stating that the material is of good quality, right quantity, etc.; without actually checking the materials. Afterwards they would just ask for the driver's sign and the process is finished. The design change proposed for this failure mode would be similar with the design change for the paper cutting failure mode, as the root cause is also similar, about SOP.

And finally, the administration process, its highest RPN is on the incorrect paper usage details inputted into the database. With its root cause being database simplifications, which is not finished yet. There are too many databases currently being used by Logistics department to record paper usage, both in physical form and monetary form. The MD Form, Stock Books, Intranet database, and Sales &

Distribution are the databases that an administrator must be familiar with to do his job properly. It is not surprising that sometimes he/she made an input mistake. While not fatal, it could be very troublesome for the Logistics supervisor to correct the entered data as he has to contact SIM department or even Accounting department to do exactly that. The design change would be the simplification of the databases into one and integrated network where all of the departments and divisions shared the same data center. SM department, who is responsible for all things IT-related within the company, is currently developing the integrated information system; with the company expecting it to be online in 2019.

Therefore, summarized into a table:

Table 4.1. Proposed Design Change for PT. Kanisius based on Process FMEA

Process	Design Change
Paper Cutting Process	Trainings to increase awareness and importance of SOP should be done to eventually build SOP-oriented company culture
Paper Delivery to Printing Dept. Process	The purchase of a dedicated handcart belonging solely to Logistics department, and its old counterpart would act as a mobile handcart that can be used by departments which does not possess one.
Materials Receiving Process	Trainings to increase awareness and importance of SOP should be done to eventually build SOP-oriented company culture
Administration Process (Data Input)	Simplification of the databases into one and integrated network where all of the departments and divisions shared the same data center

CHAPTER 5

CONCLUSION AND SUGGESTIONS

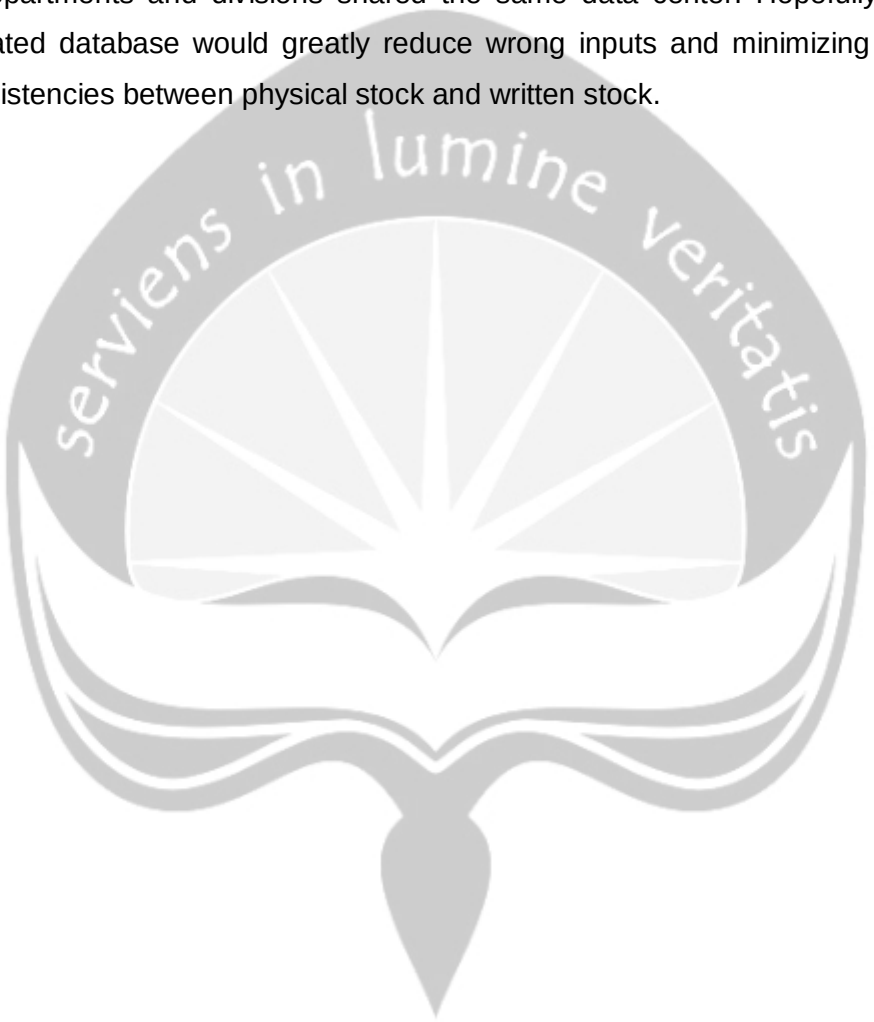
Chapter 5 contains the conclusion taken by the student after the internship and also the recommendations or suggestions that may be given to the company based on the student's experience working in the company and also the supervisor's project.

5.1. Conclusions

a. Student is able to understand how the company works as a system that aims to gain profit from its operations.
b. Student gains a good amount of knowledge of how a Logistics division in a company operates.
c. Student receives valuable insights and advices from field supervisor, how to interact and adapt to the work environment.
d. Student took part in the company's daily operations, especially in the Logistics department and CTP department. Gained valuable insights and knowledge.
e. PPIC-Logistics department implement too many databases (3) for its raw material stock management. It is overwhelming for new employees or interns. An integrated information system is desperately needed to prevent further unnecessary mistakes or errors.
f. Company's work culture truly embodied the values held by the company, which are honesty, discipline, spry, competent, and learner.
g. Student was not given any projects by the field supervisor, instead lecturer gave a freedom to conduct any project deemed fit to solve company's problems.
h. Standard operating procedure was not really enforced in day-to-day operations. Even as an intern, SOP was not introduced to student at all prior to the student asking
i. Student is able to give recommendation and suggestions to the company by utilizing the FMEA method to analyze the processes within the Logistics Department

5.2. Suggestions

a. Employee trainings to increase awareness and importance of SOP should be done to eventually build SOP-oriented company culture.
b. Company should consider purchasing a dedicated handcart for Logistics department, and its old counterpart would act as a mobile handcart that can be used by departments which does not possess one.
c. Simplification of the databases into one and integrated network where all of the departments and divisions shared the same data center. Hopefully an integrated database would greatly reduce wrong inputs and minimizing the inconsistencies between physical stock and written stock.



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APPENDIX 1

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
Incorrect type of paper is cut	Cutting process have to be repeated from the beginning	8	a) Lack of adequate training to enforce SOP	4	Employee performance evaluation is done every 3 months	4	128
			b) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	2	32
			c) Ineffective labelling system of papers	2	Labelling is only done on the front side of material pallet	2	32
			d) Operator did not crosscheck job ticket with order details	2	Two operators are always present to do cutting process so that each can check up on the other	2	32
Papers cut have incorrect dimension (length or width)	Extra papers have to be cut to accommodate the incorrect ones	8	a) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	4	64
			b) Operator lacks experience	1	A new operator is constantly supervised until he is skilled enough	2	16

Complete Failure Mode Effects Analysis (FMEA) Table (Continued)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
			c) Lack of regular inspection on the cutting machine	3	Operator checks the machine's condition before use every week	3	72
			d) New cutting machine is not considered a priority	1	Machines condition and capability are reviewed every year	7	56
Insufficient amount of papers was cut	Additional time is wasted on cutting additional papers	7	a) Admin is inexperienced or is an intern	2	Paper counting is done two times, when it was first taken from warehouse and second is when it's about to be cut	3	42

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE (CONTINUED)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
			b) Operator is still learning the proper technique to count papers	2	A new operator is constantly supervised until he is skilled enough	2	28
			c) Lack of a handheld automatic counting machine	5	Tools condition and capability are reviewed every year	3	105
			d) Late delivery by supplier	7	Supplier performance is monitored and reviewed constantly by purchasing department	1	49

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE (CONTINUED)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
			e) Inconsistencies between written stock and physical stock	9	Stock opname is done once a month	1	63
Delivery to the printing dept is behind schedule	Printing machine is idle and schedule is delayed	8	a) Handcarts are constantly moving through multiple departments	8	Just before cutting process is finished, one operator is on the lookout of a handcart	4	256
			b) Lack of any punishment system should the schedule fall behind	1	SOP is being reviewed once a year	7	56

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE (CONTINUED)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
			c) Late delivery by supplier	7	Purchasing department regularly checks in with logistics about incoming materials	1	56
			d) Inconsistencies between written stock and physical stock	9	Stock opname is done once a month	1	72
SOP for filling material receiving form was not followed thoroughly	Defective and imperfect material might be overlooked	6	a) Lack of adequate training to enforce SOP	9	Employee performance evaluation is done every 3 months	4	216

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE (CONTINUED)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
			b) No immediate consequences for not following SOP	9	SOP is being reviewed once a year	8	432
			c) Filling the form according to SOP is considered too troublesome	10	No control exists as of now	10	600
			d) Supervisor supports the perception that every material is considered of good quality	10	No control exists as of now	10	600

COMPLETE FAILURE MODE EFFECTS ANALYSIS (FMEA) TABLE (CONTINUED)

Failure Mode	Consequences	Severity (S)	Root Causes	Occurrence (O)	Process Control or Indicator	Detectability (D)	Risk Priority Number
Incorrect paper usage details were inputted into the database	Calculations done by the Finance department would be inaccurate	9	a) Database simplification Is not finished yet	10	Supervisor cross-checks the data written on multiple databases every day to make sure every input is correct	3	270
			b) Admin is inexperienced or is an intern	2	Mentor checks on tasks done by the intern everyday	2	36

APPENDIX 2

COMPANY BUSINESS PROCESS

Customer Order Business Process at PT KANISIUS