INDUSTRIAL PRACTICE REPORT
IN PT. KANISIUS

ANATASIA DENDY SEPTINA PRASETYANI
14 14 07899

INTERNATIONAL INDUSTRIAL ENGINEERING PROGRAM
FACULTY OF INDUSTRIAL TECHNOLOGY
UNIVERSITAS ATMA JAYA YOGYAKARTA

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APPROVAL

The report written based on industrial practice at PT Kanisius during the period of August 2nd, 2018 to September 6th, 2018 by:

Name	: Anatasia Dendy Septina Prasetyani
Student ID	: 14 14 07899
Study Program	: International Industrial Engineering
Faculty	: Industrial Technology

Has been checked and approved.

Yogyakarta, November 17th, 2018

On Site Supervisor	Faculty Supervisor
Yulius Pria Sasongko	Brilianta Budi Nugraha, S.T., M.T.

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www.tuv.com
ID 9105057786

Jl. Cempaka 9 Deresan, Caturtunggal, Depok, Sleman,
Daerah Istimewa Yogyakarta 55281, INDONESIA
Tel. +62 274 588783, Fax. +62 274 563349
Email: office@kanisiusmedia.co.id
www.kanisiusmedia.co.id

PT KANISIUS
Mengasah Budi Mengolah Hati

SURAT KETERANGAN

No. 865/A/SDM/RB/XI/2018

Yang bertanda tangan di bawah ini :

Nama	: Danang Afriady Kurnianto
Jabatan	: Kepala Departemen Pengembangan
Nama perusahaan	: PT KANISIUS
Alamat	: Jl. Cempaka 9 Deresan Yogyakarta 55281

Menerangkan bahwa :

Nama	: Anatasia Dendy Septina Prasetyani
NIM	: 141407899
Fakultas	: Teknologi Industri, Universitas Atma Jaya Yogyakarta
Program Studi	: Teknik Industri Kelas Internasional

Telah melaksanakan Praktik Kerja Lapangan di PT KANISIUS mulai tanggal 2 Agustus s.d. 6 September 2018 di Bagian PPIC Divisi Percetakan.

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

Yogyakarta, 9 November 2018
Hormat kami,

Danang Afriady K
Kadep. Pengembangan

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PREFACE

This report is composed as the complementary of industrial practice requirements of Faculty of Industrial Engineering Universitas Atma Jaya Yogyakarta. Other than that, this report is a form of final result of industrial practice process, that shows the knowledge gained from PT Kanisius.

Author would like to thank God for His blessing during the industrial practice period until accomplishment of this activity so that the report can be prepared well and submitted on time.

During the completion of this activity, author has also been given a lot of motivation, support, and also guidance by all parties, and in this occasion, author would like to express the gratitude to:

1. Family members who always give all of support and motivation everyday during industrial practice.
2. The Dean of Faculty of Indutrial Engineering, Dr. A. Teguh Siswantoro and Head of Industrial Engineering Study Program, Mrs. Ririn Diar Astanti, S.T., M.MT., D.Eng for giving the opportunity to do industrial practice.
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4. Mr. Brilianta Budi Nugraha, S.T., M.T. as the Faculty Supervisor for his supervisee during the process of industrial practice and the preparation of this report.
5. Mr. Pria Sasongko as the On-site Supervisor and also the Head of Sub-department of PPIC, JSA-Expedition Team.
6. Mr. David as the HRD Staff who did the recruitment for the student to do industrial practice in PT. Kanisius.
7. Mrs. Budiastuti as the Head of Percetakan Division and Head of PPIC Department.
8. Mr. Bambang, Mr. Eko, Mr. Febru, Mr. Avid, Mr. Yuli, Mr. Agung, the member of JSA (Job Scheduler & Analyzer) and Expedition Team.

Industrial Practice in PT. Kanisius from August 2nd, 2018 until September 6th, 2018 has been completed and the industrial practice report has also been prepared and done on time.

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CHAPTER 1
INTRODUCTION

This chapter will describe the background of the industrial practice activity, the purpose of industrial practice, as well as the task and schedule for the industrial practice that done by the student in PT. Kanisius.

1.1. Background

According to Document Curriculum of PSTI UAJY, internship is an academic course in which the students should register for the course for 2 credits. Industrial Engineering Program of Atma Jaya Yogyakarta University (PSTI UAJY) defines the internship as a simulator that enables the students not only to apply the Industrial Engineering knowledge into real-world industry but also to train the student how to be a professional of Industrial Engineer. For this purpose, during the internship the students are requested to work in the host company within a period of month.

The paradigm of internship is that the students are expected to experience the application of Industrial Engineering knowledge in practice in which it can be obtained if during their internship the students do some activities to enhance their understanding in term of planning, designing, improving, implementing and problem solving. Therefore, during the internship period students are requested to:

a. Learn about the scope of the company
b. Doing all the tasks that have been assigned by the host company
c. Following all of relevant working procedures of the host company
d. Capturing the big picture of the enterprise system in the host company and observing its characteristics
e. Conduct a report for the internship activity

1.2. Objective

The aims of this internship activity are:

a. Adapt with the working atmosphere
b. Improve the interaction between student and his/her ordinate or workmate
c. Practice Discipline
d. Observe the daily work in the host company

e. Enhance the Industrial Engineering knowledge in practice by seeing the practical work in the host company
f. Enhance the knowledge of enterprise system

1.3. Internship Schedule

Period of the internship is one month start from 2nd August 2018 until 6th September 2018 (Work days: Monday to Saturday) in PT. Kanisius (Penerbit & Percetakan). The internship will be continued by making report, evaluation and examination about the internship. During the internship period, the intern was place in Production Planning and Inventory Control Job Scheduler Analyzer (PPIC JSA).

CHAPTER 2
COMPANY OVERVIEW

This chapter will explain about the general information of PT. Kanisius. This chapter will describe more about the system of the company, the organizational structure, as well as the facilities in the company.

2.1. History of PT. Kanisius

The history of PT. Kanisius will be explained through brief history of PT. Kanisius and the company profile of PT. Kanisius.

2.1.1. Brief History of PT. Kanisius

PT. Kanisius was first established on 26th January on 1922, by the name Canisius Drukker'j. Canisius Drukker'j is an initiative of Superior Missionary, Pastor J. Hoeberechts, SJ, and also one of the missionary works of the Kanisius Foundation which was then called Canisius Vereniging (Association of Canisius). By that time, Canisius Drukker'j was a small printing press that printed books for the benefit of church worship and educational books, using 2 kind of machine and operate by 3 workers. The main mission of Canisius Drukker'j was to become a printing press that could provide textbooks for schools and prayer books for the Catholic Church all over Indonesia. At the time of its establishment, the location of Canisius Drukker'j was in Jalan P. Senopati No. 16, Yogyakarta. On December 1923, the printing activity was done in the new building with the area 200 m^2 in the same field with the addition of new machine and new workers with the total was 20 workers.

In 1928, the company starting to print many kind of magazine such as Tamtama Dalem and Swaratama that contributes in the movement of the Indonesian youth in independence era leads by Bruder Bertinus (1928-1933). Around 1930, the worker was added and become 90 workers and the company starting to receive more order. The location also moves to the new building with the total area 1200 m^2 located in the east side of Kiduloji Street. By that time, Bruder Bertinus cannot lead the company because of his illness and his position is replaced by Bruder Baldewinus. In 1937, there were addition of 8 machines for the process which are linotype machine, big snelpers (Mile and Lee), automatic degelpers (Kobolt), line machine, cutting machine, machine for book’s knitting process, and two hand press machines.

Then in 1946, with the leads of Father A. Djajasepoetra SJ, Kanisius was gained the trust from Indonesian government to print Indonesian currency called ORI (Oeang Repoeblik Indonesia). In 1950s, the logo of Kanisius was made, and in 1951, Kanisius started to publish books for school to meet the educational needs such as English all over the World I, English all over the World II, Peladjaran Ilmu Ukur, Ex Oriente Lux I-III (Sejarah Dunia I-III), besides publishing the books for Catholic Church. In 1967, Kanisius was starting to build in area of Deresan as the first offset printing in Indonesia led by Father Lampe. Modernization of the machine is done by adding three offset printing machines from Europe which is Romayor, Solna, and Multilit. Modernization is also done in reproduction, composing, and administration. In August 1969, there were many additional for machine in the finishing area.

In 1970s, Penerbit dan Percetakan Kanisius was led by the cooperation between priests from Jesuit with local people. In that time, there were many modernizations in many fields in Kanisius and give a great impact in the development of human resources and financial improvement in the company. There is also increasing the variety of books printed and published by this company.

Entering 2001, Kanisius started to build a website which is http://www.kanisiusmedia.com to provide the information about the product, activity, and also for online market. Since 1st January 2014, Penerbit dan Percetakan Kanisius changed the form of its business entity into PT (Perseroan Terbatas) which was later called PT. Kanisius with the Jesuit Priest as its president director and common people in the organization structure. Until now, PT. Kanisius grew to publishers and printing that has customers from all around Indonesia.

2.1.2. Company Profile

The company profile of Penerbit dan Percetakan PT. Kanisius where the practical work was done as follows:

Company Name	=	PT. Kanisius
Date of Establish	=	26th January 1922
Industrial Classification	=	Publishing and Printing (Offset and Digital)
Address	=	Jalan Cempaka No. 9, Deresan, Depok, Sleman, Daerah Istimewa Yogyakarta 55281

Area of Company	=	22.803 m^2
Website	=	www.kanisiusmedia.co.id
E-mail Address	=	office@kanisiusmedia.com
Phone/Fax	=	(0274) 588783; (0274) 565996 / (0274) 563349
Number of Employee	=	±350 Employees

2.2. Organizational Structure

2.2.1. Overall Organizational Structure

In running the system as a manufacturing company, PT. Kanisius has its staff which is arranged in an organizational structure. Nevertheless, since its establishment era, PT. Kanisius is managed by the Kanisius Foundation under the supervision of the Jesuit. Therefore, PT. Kanisius was led by a president director who was also a Jesuit and was a Father however the coordinating line under the president director is a director who is a common people (*awam*) and the organizational structure after the directors are held by common people with different educational backgrounds.

In its Organizational structure, PT. Kanisius has 5 main divisions with direct coordination line under the president director and the director. The divisions are consist of *divisi penerbitan, divisi percetakan, divisi penjualan, divisi keuangan,* and also *divisi sumber daya manusia (SDM) dan sarana prasarana.*

2.2.2. Job Description of Each Division

In the organizational structure of PT. Kanisius, there are 5 main divisions with the direct coordination line under the president director and the director. The job description of each main division as follows:

A. *Divisi Penerbitan*

Divisi Penerbitan is responsible for all forms of book publishing that are published by PT. Kanisius such as publishing new product of book that done by searching the author that want to publish a book, editing the book with the editor, etc. There are three departments in *divisi penerbitan*, they are Department of *Gerejawi*, Department of *Kependidikan Umum*, and Department of *Penerbit Eksklusif* (Kanisius Exclusive Publishing). The complete Organizational structure of *Divisi Penerbitan* can be seen in Figure 2.1.

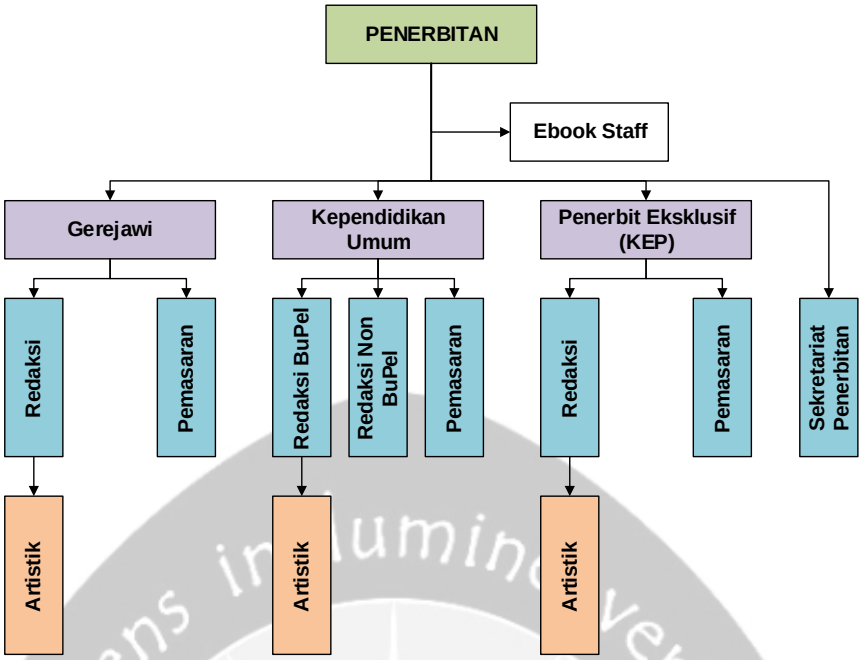


Figure 2.1 Organizational Structure of Divisi Penerbitan

Department of *Gerejawi* is responsible for the publication of spiritual books or related with the church. In this department, the task is divided into two parts which are *Redaksi Gerejawi* and *Pemasaran Gerejawi*. The examples of books that publish by this department are Book of *Tata Perayaan Ekaristi*, *Madah Bakti*, the Bible, sacramental handbooks for *Komuni Pertama*, *Sakramen Krisma,* and so on. There are also books of philosophy, theology, catechesis, spirituality, prayer and worship books, inspirational, and spiritual reading.

Along with Department of *Gerejawi*, Department of *Kependidikan Umum* also divided into two parts which are *Redaksi Kependidikan Umum* and *Pemasaran Kependidikan Umum*. In this Department, the books that publish can be categorized into two groups which are *Buku Pelajaran* and *Non-Buku Pelajaran*. The Example of *Buku Pelajaran* are universities textbook such as law, economics, health, etc., and also textbook for school according to the applicable curriculum in Indonesia such as Catholic religion books, English books, and thematic books. For the *Non-Buku Pelajaran* category, the books that produce are reading books for children and adults such as inspirational book, families' book, and books about general knowledge.

Department of Kanisius Exclusive Publishing (KEP) is a department that publishing books with the special order with the print quantity less than 1000 copies. The example of books that publish by KEP are books from universities

lecturer or schools teacher that used only inside that university or school, books for celebration of an event, etc. Most of the authors of the books that publish by KP can distribute and market their own books.

B. *Divisi Percetakan*

Divisi Percetakan is responsible to handle the print productions that consist of offset and digital printing in PT. Kanisius. This division is responsible for all activity in printing, start from market the printing service to the customer, preparing the raw material, production process, until the distribution of the final goods. This division is divided into three departments, they are department of *Pemasaran Jasa Cetak* (PJC), Department of Production Planning and Inventory Control (PPIC), and Department of *Produksi*. The complete organizational structure of *Divisi Percetakan* can be seen in Figure 2.2.

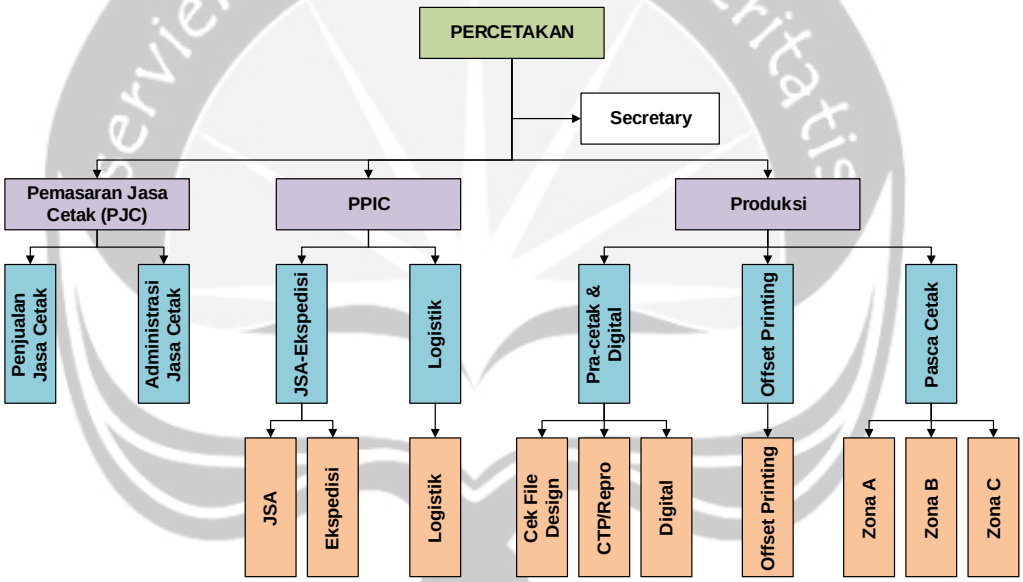


Figure 2.2 Organizational Structure of Divisi Percetakan

The responsibility of PJC department is to market the printing services to find the potential customer and deal with the customer about the order specification, order approval, and the price of the order. In running the function, this department can be divided to two sub-departments which is Sub-department of *Penjualan Jasa Cetak* and Sub-department of *Administrasi*.

Department of PPIC is the department that responsible with the production process. Subsequent to the activity of PJC department which is deals with the customer, the order specification will send to the PPIC department. PPIC

department is divided into two sub-department namely PPIC JSA-*Ekspedisi* and PPIC *Logistik*. PPIC JSA-*Ekspedisi* is running 2 function in the production process which is JSA (Job Analyzer Scheduler) and *Ekspedisi*. JSA is responsible to making the planning and schedule the production process while the function of *Ekspedisi* is to manage the distribution of the final product. Sub-department of *Logistik* is responsible for the raw material that will be used for production. In *logistik*, the responsibility is to monitoring the use of the raw material that needed in the production process to fulfill the demand, as well for controlling the stock of the raw material to anticipate the demand.

For department of *Produksi*, the responsibility is to process the production for all of the order using any kind of machines and raw materials based on the data from the scheduler and analyzer.

C. *Divisi Penjualan*

Divisi Penjualan is the division that responsible for all the process in selling the product of PT. Kanisius. Product of PT. Kanisius can be divided into two types which are internal products and External products. Internal product means product that produce by PT. Kanisius and comes from the author of Kanisius Publishing. Meanwhile external products are the product from outside of PT. Kanisius. The example of external products that not in form of sheet are books, magazines, rosario, cross, candle, and christmas ornament. The products of PT. Kanisius are sold in the showroom of PT. Kanisius that called *Taman Komunikasi* as can be seen in Figure 2.3.

Figure 2.3 Products that sold in *Taman Komunikasi*

Divisi Penjualan is divided into two departments namely Department of *Perdagangan* and Department of *Penjualan.* The complete organizational structure of *Divisi Penjualan* can be seen in Figure 2.4.

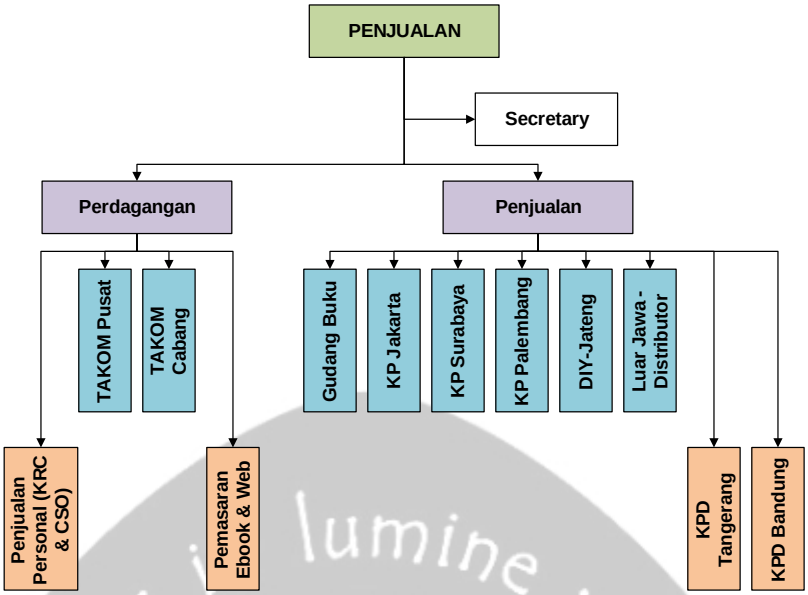


Figure 2.4 Organizational Structure of Divisi Penjualan

Department of *Perdagangan* is department that responsible to manage the showrooms that owned by PT. Kanisius (*Taman Komunikasi*) that scattered all around Indonesia, to maintain the books supply in each showroom. The task of Department of *Perdagangan* can divided into personal selling, *takom-showroom pusat, takom-showroom cabang*, also web marketing and e-book. In other hand, Department of *Penjualan* is responsible for selling and also distributing PT. Kanisius product through marketing office that scattered in several cities in Indonesia. This department also has responsibility to manage the stock of books in the warehouse.

D. *Divisi Keuangan*

Divisi Keuangan is the division that responsible for all the financial and administrative affairs in PT. Kanisius. This division is responsible to report and manage the flow of the money that receive by the company and the money that use in running company to make sure all process run in balance and the company reach the profit.

Divisi Keuangan is consist of Department of *Keuangan* and Department of *Akuntansi*. The complete organizational structure of *Divisi Keuangan* can be seen in Figure 2.5.

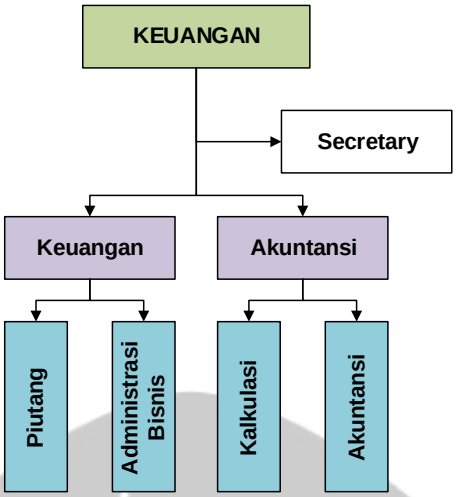


Figure 2.5 Organizational Structure of Divisi Keuangan

Department of *Keuangan* is responsible to manage the corporate receivables and also the business administration. This department is divided into two parts which are *Administrasi Bisnis* and *Piutang.* Department of *Akuntansi* is responsible for the calculation of the finance as well as bookkeeping company. This department is divided into two parts namely *Akuntansi* and *Kalkulasi*.

E. *Divisi Sumber Daya Manusia dan Sarana Prasarana (SDM Sarpas)*

Divisi SDM Sarpas is the division that responsible for the management of human resource and the facilities of PT. Kanisius. All the process that related to the recruitment and training of employee as well as care and development of the facilities in the company is managed by this division. This division is divided into two departments namely department of *Pengembangan* and Department of *Sarana Prasarana.*

Department of *Pengembangan* is responsible for the process that related with the human resource management. The responsibilities of this department are in the recruitment of the employee as well as the placement of every employee, organize training activity for the new employee, and for the selection process in receiving student and internship. This department is divided into two parts which is *Kepegawaian* and *SDM dan Organisasi*. The complete organizational Structure of *Divisi SDM Sarpas* can be seen in Figure 2.6.

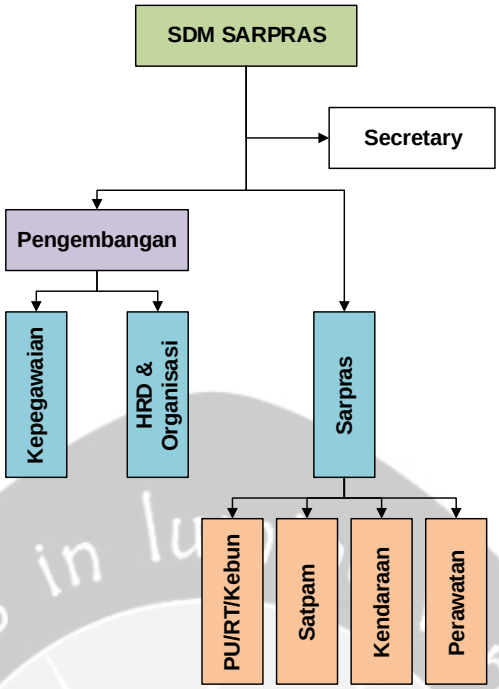


Figure 2.6 Organizational Structures of Divisi SDM Sarpas

While Department of *Sarana Prasarana* is responsible for many units which are security, garden, maintenance, and vehicles. This department is also responsible for monitoring the condition of the facilities of the employee, arrange the parking facilities for the employee, and maintain the entire machine in production process.

2.2.3. Job Description of Sub Department PPIC JSA-*Ekspedisi*

During the period of industrial practice in PT. Kanisius, student was placed in Sub Department PPIC JSA-Ekspedisi. The organizational structure of sub department PPIC JSA-Ekspedisi shown in figure 2.7. Based on the organizational structure, Mrs. Budiastuti as the Manager of *Percetakan* also works as the Head of Department PPIC. PPIC JSA-Ekspedisi is a sub-department under PPIC that headed by Mr. Pria Sasongko. Below that is the head of JSA-Ekspedisi Unit is Mr. Bambang Suprianto.

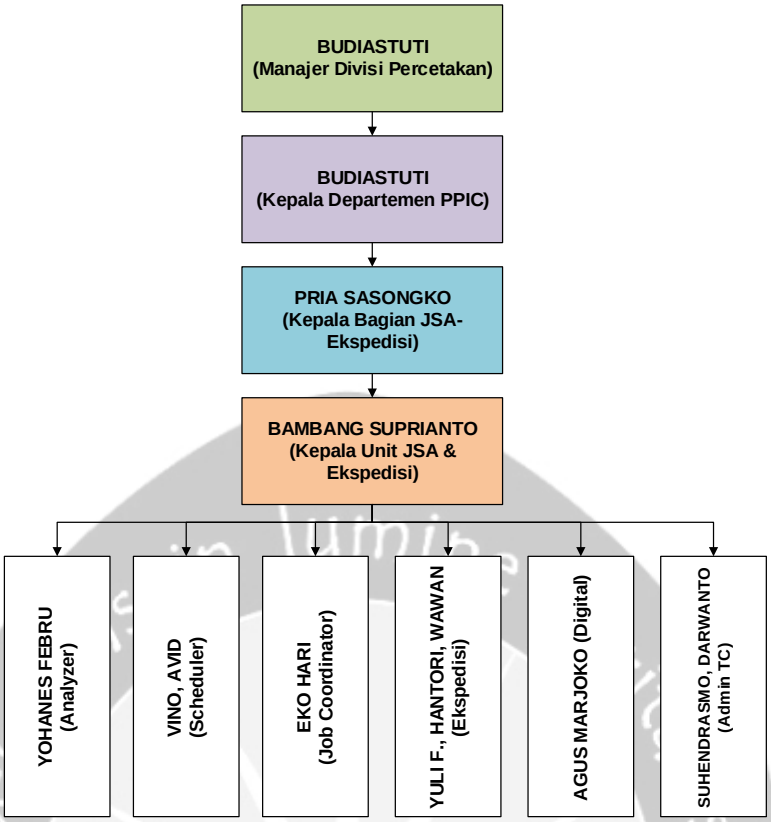


Figure 2.7 Organizational Structure of PPIC JSA-*Ekspedisi*

Based on the organizational function above, in JSA-Ekspedisi Unit, there are six functions that run by the staff of PPIC JSA-Ekspedisi. The functions as well as the job description are:

A. Analyzer

Analyzer is one of the functions in *JSA-Ekspedisi* Unit that run by Mr. Febru. The job description of analyzer as follows:

- Analyze and make the product specification planning for the production based on the production capacity and machine capability (size, color, dan process)
- Make the recommendation of machine use for every process in production.
- Determine the type, size, and amount of the raw materials to meet the demand.
- Communicate with the Sub-department of PJC (*Pelayanan Jasa Cetak*) when determining customer order specifications. The goal is to be determined specifications that can be met by the company by adjusting the availability of raw materials, production process capabilities, and various other factors.
- Do archiving of order planning file every day.

B. Scheduler

In JSA-Ekspedisi unit, there are two kind of scheduler namely offset printing scheduler and post-printing scheduler. Offset-printing scheduler tasks are done by Mr. Vino with the job description as follows:

- Calculates the production process time based on the planning made by the analyzer.
- Determine the machine that used for the printing process based on the recommendation of analyzer.
- Scheduling the production process of plate printing and offset printing activity by plotting the schedule into the scheduling table
- Calculating both overtime and long-shift.
- Insert daily comment for problems that appear in scheduling
- Do re-scheduling if needed.

Beside the task of offset-printing scheduler, there is also task of scheduler for post-printing that performs by Mr. Avid. The job description as follows:

- Calculates the process time for every order based on the planning made by the analyzer.
- Determine the machine that used for post-printing process based on the recommendation of analyzer.
- Scheduling the post-printing process activity in zone A, zone B, and Zone B by plotting the schedule into the scheduling table for every order.
- Calculating both overtime and long-shift.
- Assisting the analyzer in determining customer order specifications that can be fulfilled by the company especially in terms of finishing the product.
- Perform proofing process for certain finishing process and give correction if sample of finishing process examined not in accordance with request.
- Insert daily comment for problems that appear in scheduling
- Do re-scheduling if needed.

C. Job Coordinator

Job Scheduler is one of the function in JSA-Ekspedisi Unit and run in two shifts by Mr. Eko and Mr. Bambang alternately. The job description of analyzer explains below:

- Distribute job ticket to related sub-departments according to production planning.

- Ensure and controls scheduling execution runs in accordance with the schedule that has been made.
- Provide input to the scheduler if re-scheduling is required.
- Ensure the transfer of semi-finished goods from one unit to another unit.
- Monitor outsourced processes to partners for processes such as print cover, hotprint, emboss, and so on.

D. PPIC Ekspedisi

Ekspedisi Unit is one of the functions in *JSA-Ekspedisi* Unit that run by Mr. Yuli, Mr. Wawan, and Mr. Hantori that related with the distribution of the final products. The tasks of PPIC *Ekspedisi* explain below:

- Make delivery letters for shipping the finished product both internally and externally
- Delivering the finished product to the customer both internally and externally.
- Conducting the process of closing internal and external corporate orders (from customers).
- Send and receive outsource results from semi-finished goods.
- Conducting the process of packing the finished product and calculating the number of ready-to-deliver products.
- Reporting the advantages or disadvantages of the number of finished products in accordance with the results of the calculation.
- Inputs the sending data into the system and archives the file day by day.
- Pack the finished product.
- Do the maintenance of expedition vehicles to maximize the productivity of the process in JSA-*Ekspedisi* unit.

E. PPIC Digital

Digital Unit in Sub-department of *JSA-Ekspedisi* is different from Digital Print Unit in Sub-department of *Pra-cetak* and Digital. PPIC Digital function is one of the tasks in PPIC JSA-Ekspedisi that focus in the digital printing process. This task is done by Mr. Agus. The job description of PPIC Digital as follows:

- Calculating the time of digital production process based on target to be ordered product.
- Scheduling the production process in digital, for both the printing and post-printing activity
- Re-scheduling an order that changes schedule by scheduler.
- Create a print-out of digital order data.

- Make an analysis of the finished order in the Digital Print Unit.
- Achieving file for the scheduling, analyzing finish products, and analyzing order deviations.

F. Admin Time Card (TC)

Admin TC is one task in JSA-Ekspedisi unit that perform by Mr. Suhendrasmo and Mr. Darwanto. The job descriptions of Admin TC are as follows:

- Collect and process time card data.
- Perform archiving activities of time card report.
- Attract or collect time card data from the program.
- Coordinate with related sections to collect time card data.
- Print the data of Time Card
- Stores the archive of time card data in the space provided.

2.3. Company Management

This part will describe the management system of PT. Kanisius including the vision and mission of the company, the employment for the recruitment process, compensation system, and working hours. This part also explains about marketing system of the company and the facilities in the company.

2.3.1. Vision and Mission

Vision of PT. Kanisius

Being a professional company and customer's primary choice through publishing, printing and trading products to realize a nationalist and dignified society.

Mission of PT. Kanisius

1. Engage in Church work and Community education.
2. Prioritize customer satisfaction by providing publications, printed products, ecclesiastical equipment and complete and quality education.
3. Strengthen and increase the number of customers by building *Taman Komunikasi (TAKOM)* and synergize with strategic partners.
4. Achieve growth and profitability through increased sales and cost control.
5. Improve employee productivity with professional human resource management system.
6. Utilizing the right technology to optimize business operations and create innovative products.

The values implemented in PT. Kanisius are as follows:

1. Honesty
2. Discipline
3. Wide-awake
4. Competent
5. Learners

2.3.2. Employment

A. Recruitment

The recruitment process for the employee in PT. Kanisius is done by Department of *Pengembangan* in the division of SDM *Sarpras.* The recruitment is based on the human resources that request by each division likewise for the qualification of the recruitment adjusted to the position that needed by the division. The publication of the job vacancies usually done through website of PT. Kanisius, social media, newspaper, announcements to Churches, or through employees of PT. Kanisius personally. The data that needed for the recruitment process are Curriculum Vitae (CV), a copy of a diploma, a copy of the Identity Card (Kartu Tanda Penduduk or KTP), a copy of the last value transcript, a portfolio of works ever made, a recent photograph, and a supporting file according to the desired position.

There are there stages in the recruitment process, they are administrative, written test, and interview test. The applicants have to pass each test to become the employee of PT. Kanisius. In the final of the interview test, there is negotiation process related to the salary. If the applicant and the company gets an agreement, then the contract signing will be done. After signing the contract, the applicants then officially become the new employee in PT. Kanisius. For the first 3 months of the work, the new employee will be accompanied by a department mentor and will be explained about the company's vision and mission, the organizational structure of the company, company’s business processes, ISO certification, and also about the company's health and safety system.

B. Compensation System

In the compensation system, PT. Kanisius applies the 3P principles to the payment of the employee. The 3P principles mean Pay for Position, Pay for Performance, and Pay for Person. The Salary of the employee is consist of basic salary, allowances and salary from Yayasan Dana Pensiun (YaDaPen). The

allowances for permanent employees consist of job allowances, functional allowances, child support, husband/wife allowances, yadapen family allowances, and other benefits. PT. Kanisius also provide subsidies for the employee in form of rice, educational saving for children and payroll subsidies. For the employees that come late, come home early, and do not come to the work, the company also applies cuts in wages.

C. Working Hours

The working hours in PT. Kanisius is divided into two types which are regular working hours and shifting working hours. The working days are from Monday to Saturday. Regular working hours is done for all departments except for the production and logistics. Regular working hours start from 07.30 – 15.00 WIB for Monday to Friday with the break time from 11.30 – 12.30 WIB, and for Saturday, it starts from 07.30 – 12.30 WIB without break time.

Shifting working hours is done for the production and logistics. Production department is work based on the schedule made by PPIC JSA and the working hours usually in 2 shifts but if needed, the production department can work in 3 shifts. For the logistic, the workers always divided into two shifts. From Monday to Friday, the first shift starts from 06.30 – 14.00 WIB with the break time from 10.30 – 11.00 WIB. For the second shift, it starts from 13.30 – 21.00 WIB with the break time from 17.30 – 18.00 WIB. On Saturday, the first shift starts from 06.30 – 11.30 WIB while the second shift start from 11.00 – 16.00 WIB, both without break time.

2.3.3. Marketing System

For the marketing system, PT. Kanisius has several marketing offices that scattered in several cities in Indonesia. The main marketing office of PT. Kanisius is located in Yogyakarta while the rest of them are located in Jakarta, Tangerang, Bandung, Surabaya, and Palembang. The function of the marketing office is to assist the marketing process in the city and around the city where the marketing office is located. The profile of each marketing office of PT. Kanisius as follows:

A. Marketing Office in Yogyakarta

Address	:	Jl. Cempaka No. 9, Deresan, Caturtunggal, Depok, Sleman, Daerah Istimewa Yogyakarta 55281 Yogyakarta
Phone	:	(0274) 588783
Fax	:	(0274) 563349

Email : office@kanisiusmedia.co.id

B. Marketing Office in Jakarta

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

Phone : (021) 84596565, 081229066262

Fax : (021) 84307525

Email : jakarta@kanisiusmedia.co.id

C. Marketing Office in Tangerang

Address : Villa Melati Mas Blok C3 No.22C, Jalan Cemara, Serpong Utara, Tangerang Selatan 15323 Tangerang

Phone : (021) 22356630, 081229783906

Email : tangerang@kanisiusmedia.co.id

D. Marketing Office in Bandung

Address : Jalan kembar Sari Indah 1 No.12, Cigereleng, Regol, Bandung Bandung

Phone : (022) 20453822, 088809411244

Email : bandung@kanisiusmedia.co.id

E. Marketing Office in Surabaya

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

Phone : (031) 8709929, 8709201

Fax : (031) 8709928

Email : surabaya@kanisiusmedia.co.id

F. Marketing Office in Palembang

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

Phone : (0711) 5718332, 081578811012

Email : palembang@kanisiusmedia.co.id

Beside the marketing system through the marketing office, PT. Kanisius also does marketing through the website of the company. The website address of PT. Kanisius is www.kanisiusmedia.co.id. PT. Kanisius also established *Taman Komunikasi (TAKOM)* in various cities in Indonesia in order to market the product of PT. Kanisius in a store, so customers in other cities can visit. The profile of TAKOM owned by PT. Kanisius as follows:

A. TAKOM *Pusat*

Address : Jl. Cempaka No. 9, Deresan, Caturtunggal, Depok, Sleman, Daerah Istimewa Yogyakarta 55281, Yogyakarta
Phone : (0274) 588783, 081226214209
Email : takom.pusat@kanisiusmedia.co.id

B. TAKOM Kanisius Kranggan

Address : Komplek Ruko Kranggan Permai, RT 16/4 Jl. Alternatif Cibubur, Jatisampurna, Bekasi 17433, Jakarta
Phone : (021) 84596565, 082260932285
Email : takom.kranggan@kanisiusmedia.co.id

C. TAKOM Katedral

Address : Jl. Katedral No. 7, Jakarta Pusat 10710, Jakarta
Phone : 08812642448
Email : takom.katedral@kanisiusmedia.co.id

D. TAKOM Santa Maria

Address : Jl. Daan Mogot No. 14, Tangerang, Banten 15111, Tangerang
Phone : 081210044584
Email : takom.stmaria@kanisiusmedia.co.id

E. TAKOM Santo Laurensius

Address : Jl. Sutera Utama No. 2, Alam Sutera, Serpong Utara, Tangerang Selatan 15326, Tangerang
Phone : 08566333460
Email : takom.stlaurensius@kanisiusmedia.co.id

F. TAKOM Kanisius Rungkut

Address : Kompleks Ruko Rungkut Megah Blok H/1 Jl. Raya Rungkut No. 5, Surabaya 60293 , Surabaya
Phone : (031) 8709929, 8709201, 085704
Email : takom.styakobus@kanisiusmedia.co.id

G. TAKOM Santo Yakobus

Address : Puri Widya Kencana Blok LL No. 1, Citraland, Surabaya 60231, Surabaya
Phone : 085704560041
Email : takom.styakobus@kanisiusmedia.co.id

H. TAKOM Santo Antonius

Address	:	Jl. Arifin No. 1, Surakarta 57111, Jawa Tengah, Surakarta
Phone	:	082225617629
Email	:	takom.stantonius@kanisiusmedia.co.id

2.3.4. Facilities

There are several facilities owned by PT. Kanisius that can support workers and customers activities, they are as follows:

A. Parking Lot for Employee

PT. Kanisius has many facilities for the employee, one of them is parking lot for employee. There are two types of parking lot for employees which are parking lot for car as shown in Figure 2.8 and parking lot for motorcycle as shown in Figure 2.9. The location of the parking lot for employee, both for the motorcycle and car are located on the back of the company's area.

Figure 2.8 Car Parking Lot for Employee

Figure 2.9 Motorcycle Parking Lot for Employee

B. Parking Lot for Visitors

Beside of parking lot for visitors, PT. Kanisius also has parking lot for the visitors. The visitors usually come to the company for the company matters or to visit *Taman Komunikasi* that located in the same area of the company. Similar with parking lot for employee, parking lot for visitors are divided into two types which are motorcycle parking lot for visitors as shown in figure 2.10, and car parking lot for visitors as shown in figure 2.11.

Figure 2.10 Motorcycle Parking Lot for Visitors

Figure 2.11 Car Parking Lot for Visitors

The location of the parking lot for visitors and parking lot for employees are different. The location of parking lot for visitors, both motorcycle and car are on the front of the company.

C. Canteen (Free lunch and water)

The company provides free lunch as well as free water for the employee. As explain before, on the weekdays, the employee has 30 minutes for break time.

On the break time, the employee will get lunch card and they can go to the canteen and exchange the card with free lunch that already prepared in the canteen. The condition of the canteen can be seen in figure 2.12.

Figure 2.12 Canteen in PT. Kanisius

In canteen, they also provide free water for the drink. For the free water, the location of free water is not just in the canteen but in every room in the company. Beside of the water, the company also provides free tea for every employee.

D. Toilet

One of the facilities in PT. Kanisius is toilet as seen in Figure 2.13. The toilet is located in the middle area of the company to make it easy to access by each employee.

Figure 2.13 Toilet in PT. Kanisius

E. Sport Facilities

PT. Kanisius also facilitate the sport activity of the employee by providing basketball and tennis court for the employee as seen in Figure 2.14. Beside of

that court, for the sport activity, the company also provides table tennis for the table tennis activities.

Figure 2.14 Basket ball and Tennis Court

F. Storage for Paper Waste

The production in PT. Kanisius has produced many kind of waste. One of the waste from the production activities is paper waste. Therefore, the company has facility for the paper waste namely storage for paper waste that can be seen in figure 2.15. The paper waste that collects in the storage for paper waste will be sold to the vendor.

Figure 2.15 Storage for Paper Waste

G. Storage for B3 (*Bahan Berbahaya dan Beracun*) Waste

Beside of the paper waste, the production process in PT. Kanisius also produce B3 (*Bahan Berbahaya dan Beracunl*) Waste. For this kind of waste, the company has the facility namely Storage for B3 Waste that can be seen in Figure 2.16.

Figure 2.16 Storage for B3 Waste

H. Liquid Waste Treatment

The production process of PT. Kanisius use liquid chemicals to support the production machine (printing machines). Therefore, the production process also produces liquid waste in the production process. The liquid waste then discharged to the liquid waste treatment site that can be seen in Figure 2.17 and collected for sale to the partner. Liquid waste that does not contain chemicals is also processed and sterilized for later reuse for the company supply. Processed water is used in the bathroom and is supplied to all water taps in the company, but not for consumption.

Figure 2.17 Liquid Waste Treatments

I. Court

In the area of PT. Kanisius, there is a court that usually uses for the company event and also uses for the event that held by *Yayasan* Kanisius.

CHAPTER 3
COMPANY SYSTEM OVERVIEW

This chapter 3 will describe about the system in the company, including the business process, product variety, production process, and production facilities.

3.1. Business Process

Business Process mapping on this report was arrange by the student, based on the interview and observation during period of industrial practice in PT. Kanisius. The business process mapping is arrange from the order entering sub-department of *Pemasaran Jasa Cetak (PJC)* until the customer receive the finish product but more focus in the activities of PPIC JSA-Ekspedisi because student was placed in PPIC JSA-Ekspedisi sub department. The business process of PT. Kanisius can be seen in Appendix 1.

The process in Business process starts from customer order. In PT. Kanisius, the order can be from internal or external customer. The order first receives by PJC. PJC will deal with the customer about the file and specification of the order, after that, the file will be checked by *Cek* File Design. After Checking the file, if there are no problem in the file, *Cek* File Design will print and process the example of finish product for proofing. Then, the product will be given to PJC for approving process with the customer. If customer approves the product, the order will be process but if not, *cek* file design will process again the product based on customer desire.

Move to next process, PJC will send the document of order specification, in form of Kantung Order to PPIC JSA-Ekspedisi. Kantung Order will receive by Analyzer. Here, the analysis process will be done. First, the Analyzer will check if the order is new order or not, if it is not new order, analyzer will check for the availability of the plate. If the plate is available, Analyzer will check again if there are problems with the plate, if there are no problem, then Analyzer can make the analysis of the order. The analysis of order that don't have plate before, will be send to CTP for the plate making process. For the re-order product, plate making process is not needed so the analysis will be send directly to logistik. Before send to CTP and logistik, the analysis of the order has to be approved by the head of sub department PPIC JSA-Ekspedisi and has to be sent to scheduler for making the schedule. The schedule for plate making process done by the scheduler of offset

printing. After plate is ready, the plate will be sent to logistik department for the preparation of the raw material and will be sentt to offset printing. Printing process will be start the production based on the schedule made by offset printing scheduler.

The result in the offset printing is WIP product and need the finishing process. Finishing process in post-printing sub department. The activity in post printing sub department is divided into 3 zona and scheduled by the post-printing scheduler. The result of post-printing sub department is the finish product. Then, finish product will be send to *Ekspedisi* team for packaging and distribution process until the final product meet the end customer.

3.2. Product Variety

The products that produce by PT. Kanisius are based on the order. The order comes both from the internal and external. From the internal, the order comes from department of *Penerbitan* that work for book publishing. There are 3 categories of books that publish by department *Penerbitan* namely *Gerejawi, Kependidikan Umum,* and Kanisius Exclusive Publishing (KEP). In other hand, PT. Kanisius also make product from the order from external customer that can be process with offset printing or digital printing depends on the quantity order and customer desire. The products that produce by PT. Kanisius both from internal and external order as follows:

A. *Gerejawi*
B. *Kependidikan Umum*
C. *Kanisius* Exclusive Publishing (KEP)
D. Magazines and Newspaper
E. Calendars
F. File Holder
G. Goodie Bag
H. Box for Packaging
I. Block note
J. Agenda
K. Cards
L. Poster, brosur, leaflet, flyer, and booklet
M. Envelopes

3.3. Production Process

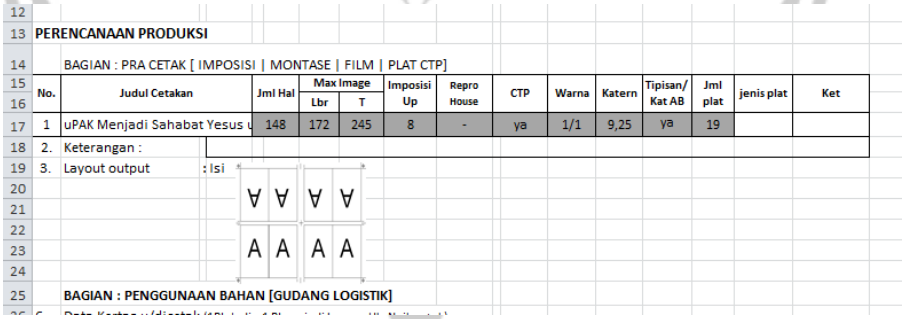
Production process at PT. Kanisius can be differentiated into two types namely offset printing and digital printing. Offset printing is done for large quantity of order such as order from the Penerbitan for Buku Pelajaran or another kind of order in hundreds or thousands quantity. Digital printing is done for the order in small quantity with the minimum order is 1 sheet.

3.3.1. Production Process of Offset Printing

Production process of Offset Printing is a printing process in which the inked print arrangement is offset or transferred from the plate onto rubber sheets in the machine to be attached to the paper so as to stamp the process. In the offset printing process, plate can be defined as the mold. In the process of offset printing, there are three stages of the process, they are pre-printing process, printing process, and post printing process. The explanation of each process as follows:

A. Pre-Printing Process

Pre-printing process in Offset printing process is for the plate making process. The plate making process done in the sub department of pra-cetak in CTP. The process in plate making is to print the file of product in a plate based on the analysis made by Analyzer that can be seen in Figure 3.1.



PERENCANAAN PRODUKSI

BAGIAN : PRA CETAK [IMPOSISI | MONTASE | FILM | PLAT CTP]

No.	Judul Cetakan	Jml Hal	Max Image		Imposisi Up	Repro House	CTP	Warna	Katern	Tipisan/ Kat AB	Jml plat	jenis plat	Ket
			Lbr	T									
1	uPAK Menjadi Sahabat Yesus	148	172	245	8	-	ya	1/1	9,25	ya	19		
2.	Keterangan :												
3.	Layout output	: Isi											

BAGIAN : PENGGUNAAN BAHAN [GUDANG LOGISTIK]

Figure 3.1 Pre-Printing Analysis from Analyzer

After receiving Kantung Order from Analyzer, the file of product will be edit by the operator of CTP for the plate printing process based on the analysis from Analyzer. After the editing process, the plate printing process is start, the raw material in this process is the raw plate that can be seen in figure 3.2. If the plate is ready, the plate will be send along with Kantung order to Logistik for the preparation of the raw material in printing process.

Figure 3.2 Raw Plate

After receiving the plate and Kantung order and plate, logistik will made the preparation of raw material based on the Analysis from analyzer that can be seen in figure 3.3 and the raw material including the plates will be send to the offset printing sub-department for the printing process.

BAGIAN : PENGGUNAAN BAHAN [GUDANG LOGISTIK]

6. Data Kertas u/dicetak (1Pl. Jadi = 1 Plano jadi berapa Uk. Naik cetak)

No.	Judul Cetakan	Jenis -Wrn & Gramatur K	Uk. naik Ctk		total insheet	total kertas	UK Plano		1 Pl. jadi	Tot. Kertas Plano	ket
			Lbr	T			Pjg	Lbr			
1	uPAK Menjadi Sahabat Yesus u	Book Paper 57,5gr. 79	718	516	65	9888	79	105	2	4944	

7. Keterangan :

8. Layout Potong : Pot. Isi

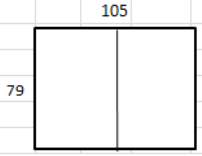


Figure 3.3 Analysis of Order for Logistik by Analyzer

B. Printing Process

Printing process is done by the offset-printing sub department, in this department, the production process done based on the analysis of analyzer that can be seen in figure 3.4 and the schedule from offset scheduler that can be seen in figure 3.5.

BAGIAN : CETAK [MESIN OFFSET | MESIN DIGITAL | CETAK LUAR]

4. Data Cetak

No.	Judul Cetakan	Jenis -Wrn & Gramatur K	Uk. naik Ctk		MESIN	Ctk	Proses Cetak	Warna Tinta	Jml Kat	Tipisan/ Kat AB	Ket
			Lbr	T							
1	uPAK Menjadi Sahabat Yesus u	Book Paper 57,5gr. 79	718	516	Miller	1/1	T/BG	K	9,25	ya	

Keterangan :

(WAT= Work and turn/BK= Balik Kertas); (T= Tumbling/BG=Balik Griper) semua ukuran dalam MM

Figure 3.4 Analysis for Printing Process by Analyzer

ROLLAND 2 W Rata-Rata 6000 / Jam		URUTAN SESUAI PRINT LIST , JIKA ADA KETIDAKSESUAIAN, SILAHKAN KONFIRMASI KE BAGIAN PPIC JSA																			
WO	Nama	kertas	wrn	jilid	jadi	oplah	Kater n	Durasi (jam)	11			12		13				14			
316680	uPAK K13 Kelas IX SMP (Siswa) - Belajar Mengikuti Yesus	HVS 70gr. 73 x 105	1/1	Perfect	28/08/2018	3005	9	8	(06.00-11.00)												
317586	uPendidikan Agama Katolik untuk SD (KTSP)- Siswa 6B	HVS 70gr 73X105	2/2	Jahit Kawat	20/08/2018	1504	4,5	6		(11.00-16.00)				(07.00-09.00)							
256069	pSpiritualitas BHK untuk SD Kelas 2	HVS 70 gr.79x109	2/2	Perfect	23/08/2018	961	7,5	9						(09.00-15.30) > (15.30-20.30)							
258469	pSpiritualitas BHK untuk SD Kelas 1	HVS 70 gr.79x109	2/2	Perfect	29/08/2018	961	10,8	12							(20.30-00.45)			(06.00-15.30) > (15.30-17.00)			
317924	uPAK - Menjadi Sahabat Yesus untuk SD Kelas VI	Book Paper 57,5 gr	1/1	Perfect	31/08/2018	1004	8,75	9,00													
433729	pInfo KRC Edisi 3 th 2018	HVS 70 gr.79x109	1/1	Jahit Kawat	09/09/2018	2000	1,5	2,00													

SCHEDULE MAYBE CHANGE ANY TIME

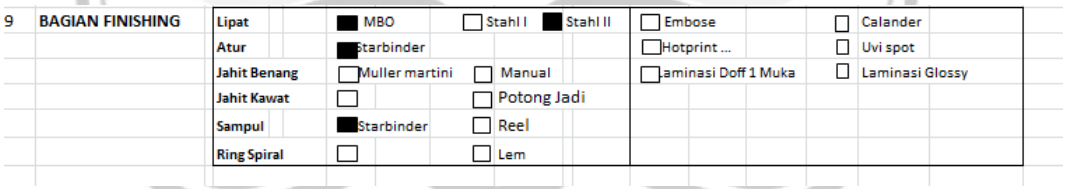
Sudah Termasuk >>> Persiapan , Brefing , Istirahat , Cuci Mesin , Ganti Tinta

Figure 3.5 Example of Printing Schedule from Offset Scheduler

In the analysis of process, the analyzer give the recommendation of machine, but the scheduler not always use the recommendation of machine because the machine that used can be adjusted with the real condition in offset printing sub department and existing order queues. The final decision for which machine will be used in the printing process is made by the offset scheduler.

C. Post Printing Process

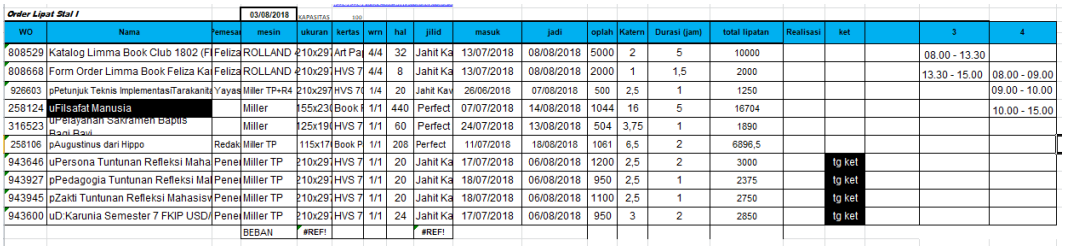
Post printing process in PT. Kanisius can be categorized into 3 zones namely Zona A, Zona B, and Zona C. If the printing process is finish, the WIP will be send to post printing department along with kantung order, inside the kantung order, the analysis of order from the analyzer is also contain the analysis for post printing process that can be seen in Figure 3.6.



9	BAGIAN FINISHING							
		Lipat	■ MBO	☐ Stahl I	■ Stahl II	☐ Embose	☐ Calander	
		Atur	■ Starbinder			☐ Hotprint ...	☐ Uvi spot	
		Jahit Benang	☐ Muller martini	☐ Manual		☐ Laminasi Doff 1 Muka	☐ Laminasi Glossy	
		Jahit Kawat	☐	☐ Potong Jadi				
		Sampul	■ Starbinder	☐ Reel				
		Ring Spiral	☐	☐ Lem				

Figure 3.6 Analysis for Printing Process by Analyzer

The process in post printing sub department is run based on the data from analyzer and post printing scheduler. the analyzer give the recommendation of machine, but the scheduler not always use the recommendation of machine because the machine that used can be adjusted with the real condition in post printing sub department and existing order queues. The final decision for which machine will be used in the printing process is made by the post printing scheduler when arrange the schedule. The example of post printing schedule from post printing scheduler can be seen in Figure 3.7.



Order Lipat Stal I — 03/08/2018

WO	Nama	Pemesan	mesin	ukuran	kertas	wrn	hal	jilid	masuk	jadi	oplah	Katern	Durasi (jam)	total lipatan	Realisasi	ket		3	4
808529	Katalog Limma Book Club 1802 (F	Feliza	ROLLAND	210x29	Art Pa	4/4	32	Jahit Ka	13/07/2018	08/08/2018	5000	2	5	10000				08.00 - 13.30	
808668	Form Order Limma Book Feliza Ka	Feliza	ROLLAND	210x29	HVS 7	4/4	8	Jahit Ka	13/07/2018	08/08/2018	2000	1	1,5	2000				13.30 - 15.00	08.00 - 09.00
926603	pPetunjuk Teknis Implementasi Tarakanit	Yayas	Miller TP+R4	210x297	HVS 7(	1/4	20	Jahit Kav	26/06/2018	07/08/2018	500	2,5	1	1250					09.00 - 10.00
258124	uFilsafat Manusia		Miller	155x23(	Book F	1/1	440	Perfect	07/07/2018	14/08/2018	1044	16	5	16704					10.00 - 15.00
316523	uPelayanan Sakramen Baptis Bagi Bayi		Miller	125x19(	HVS 7	1/1	60	Perfect	24/07/2018	13/08/2018	504	3,75	1	1890					
258106	pAugustinus dari Hippo	Redak	Miller TP	115x17(	Book P	1/1	208	Perfect	11/07/2018	18/08/2018	1061	6,5	2	6896,5					
943646	uPersona Tuntunan Refleksi Maha	Penel	Miller TP	210x297	HVS 7	1/1	20	Jahit Ka	17/07/2018	06/08/2018	1200	2,5	2	3000		tg ket			
943927	pPedagogia Tuntunan Refleksi Ma	Penel	Miller TP	210x297	HVS 7	1/1	20	Jahit Ka	18/07/2018	06/08/2018	950	2,5	1	2375		tg ket			
943945	pZakti Tuntunan Refleksi Mahasisv	Penel	Miller TP	210x297	HVS 7	1/1	20	Jahit Ka	18/07/2018	06/08/2018	1100	2,5	1	2750		tg ket			
943600	uD:Karunia Semester 7 FKIP USD/	Penel	Miller TP	210x297	HVS 7	1/1	24	Jahit Ka	17/07/2018	06/08/2018	950	3	2	2850		tg ket			
			BEBAN	#REF!				#REF!											

Figure 3.7 Example of Schedule from Post Printing Scheduler

3.3.2. Production Process of Digital Printing

Production process in digital printing is not as complicated as the offset printing process. The order and the machine are not complicated, and also the quantity is not as much as offset printing department. The production process of digital printing is divided into two processes, the printing process and the post printing process. In the printing process, the process is using digital printing, so the plate making is not needed. The machine that uses in post printing process is also more simple because the quantity is of order is smaller. The schedule and analysis for the printing and post printing is done by PPIC digital.

3.4. Production Facilities

The production facilities owned by the company can be differentiate in two categories, facilities for Offset Printing and facilities for digital printing while each category can be divided into many process.

3.4.1. Production Facilities for Offset Printing

As described in previous sub chapter, Offset printing activity can be divided into three processes namely, Pre-Printing, Offset Printing, and Post Printing. Each process has its own machine to support the activities in the process. The production facilities in each process as follows:

A. Pre-Printing Machine

The activities that categorize as the pre-printing process in offset printing are the proofing activity, the plate making activities and the activities to preparing the raw material such as paper, etc. The proofing activity is the process to make the prototype of product as the example of product to get the approvement from the customer. The machine that used in this process is plotter machine as seen in Figure 3.8 that can plot the order and print the prototype of the product.

Figure 3.8 Plotter Machine

After get the approval from customer, the pre-production activity can start with the plate making process. The machine that uses in plate making process is Computer to Plate (CTP) machine that can be seen in Figure 3.9.

Figure 3.9 CTP Machine for Plate Making Process

The department that responsible for preparing the raw material for printing activities is logistics, to support the process of preparation, logistic department has many machines which are polar cutting machine for cutting the paper that can be seen in Figure 3.10, handy trolley for placed the paper that can be seen in Figure 3.11 and machine for material handling that can be seen in figure 3.12.

Figure 3.10 Cutting Machine for Paper

Figure 3.11 Machine for Material Handling

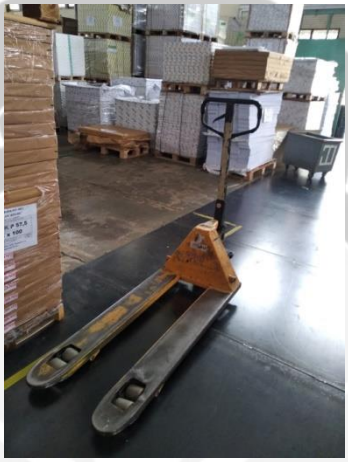


Figure 3.12 Handy Trolley for Material Handling

B. Offset Printing Machine

The printing activities in offset printing are done by 5 kind of printing machine with different specification as follows:

- Rolland 4 Colors New

Rolland 4 colors is machine that used to print full color order with the type of color is CMYK means that the machine uses combination of 4 kind of colors which are cyan, magenta, yellow, and black. This machine can use to print with the speed up to 7500 sheets of paper per hour. The setting time of Rolland 4 Colors New is 20 minutes. The minimum size of paper that can be printed with this machine is 240x420 and a maximum of 520x720 mm. This machine can print just one side of paper. Rolland 4 machine new can be seen in Figure 3.13.

Figure 3.13 Rolland 4 Machine New

- Rolland 4 Colors Old

Rolland 4 Colors Old has the same specification with Rolland 4 Colors New. The different between them is just in the setting time. The setting time that needed for preparing this machine is 25 minutes. Rolland 4 colors old can be seen in figure 3.14.

Figure 3.14 Rolland 4 Colors Old Machine

- Rolland 2 Colors

Rolland 2 Colors is printing machine that used for molds with 2 colors. 2 colors that used usually are black and other colors like red or green. The speed of this machine is up to 5000 sheets of paper every hour. The setting time of this machine is 10 minutes. This machine can be used to print for two side of paper. The minimum size of paper that can be printed using this machine is 240x320 mm and the maximum size is 520x 720 mm. Rolland 2 colors can be seen in Figure 3.15.

Figure 3.15 Rolland 2 Machine

- Miller

Miller printing machine is used to print for colors black and white. The speed of the machine is can print up to 5500 sheets of paper every hour. The minimum size of paper that can be print with this machine is 220x280 mm and the maximum is 520x720 mm. This machine can be used to print on two side of paper at once. Miller machine can be seen in Figure 3.16.

Figure 3.16 Miller Machine

- Speed Master

Speed master machine is used to print full color order. The type of color that use is the same with Rolland 4 Colors which is CMYK. The speed of the machine is can print up to 10000 sheets of paper per hour. The setting time of this machine is 15 minutes. The minimum size of paper that can be printed by this machine is 105x180 mm and the maximum size of the paper is 370x520 mm. This machine

can print just one side for each printing process. Speed master printing machine can be seen in Figure 3.17.

Figure 3.17 Speed Master Printing Machine

C. Post Printing Machine

In the post printing process for offset printing, there are 3 zones with different machines. The machines that used in every zone as follows

1. Zona A

- Stahl 1 and 2 Folding Machine

PT. Kanisius has two machines of Stahl folding machine that used for the folding process in post printing sub department that can be seen in Figure 3.18. The capacity of the machine is can fold up to 8500 sheets of paper per hours with the setting time is 30 minutes in average.

Figure 3.18 Stahl Folding Machine

- MBO Folding Machine

MBO Folding machine has the same specification with stahl folding machine. The difference is in the setting time. MBO Folding machine can be seen in Figure 3.19.

Setting time that needed is 20 minutes in average. The function of this machine is also for the folding process in *Zona A* for post printing activity.

Figure 3.19 MBO Folding Machine

- *Jahit Kawat* Machine

Jahit Kawat Machine is used for the finishing process of order *jahit kawat.* The speed of this machine is 2800 books per hours. The setting time of this machine is 45 minutes in average. *Jahit Kawat* machine can be seen in Figure 3.20.

Figure 3.20 *Jahit Kawat* Machine

- *Laminasi* Waterbased Machine

Lamination machine is used for the lamination process and usually for making the cover of a book. The speed of this machine is up to 2000 sheets of paper per hours with the setting time for the machine is 22 minutes in average. The process in this machine is lamination process and cutting process for every sheet that used to laminate. Laminasi waterbased machine can be seen in Figure 3.21.

Figure 3.21 *Laminasi* Waterbased Machine

- Polar Cutting Machine

Polar Cutting Machine is use to cut the paper in order to smooth paper size as seen in Figure 3.22. The speed of this machine is can cut up to 5000 sheets of paper per hour. The setting time for the machine is 10 minutes.

Figure 3.22 Polar Cutting Machine

2. Zona B

- Set Starbinder Machine

Set machine is the machine that used to set the pages of the book. As we know. In one book, there are more one katern (Sheet of paper) that used. This machine is help to set every katern in order to become one book. The slot of katern in this machine is just for 16 katern, so we have to do the setting process more than one if the amount of the katern is more than 16. The speed of this machine is up to 16800 books per hour. The setting time of the machine is 20 minutes in average. Set starbinder machine can be seen in Figure 3.23.

Figure 3.23 Set Starbinder Machine

- *Jahit Benang* Machine

Jahit Benang Machine is use for the *Jahit Benang* Process in making a book as seen in Figure 3.24. The speed of this machine is up to 3000 sheet of paper per hour. The setting time of this machine is 20 minutes in average.

Figure 3.24 *Jahit Benang* Machine

- Cover Starbinder Machine

Cover Starbinder Machine is used in the binding process to put the cover of the book. This machine can produce up to 2175 books per hour. The setting time of this machine is 20 minutes. Cover starbinder machine can be seen in Figure 3.25.

Figure 3.25 Cover Starbinder Machine

- Three Side Cutting Machine

Three side cutting machine is very important in the finishing process of a book. This machine is work to tidy up the three sides of the book. This machine can cut up to 2800 books per hour with the setting machine is 30 minutes in average. Three side cutting machine can be seen in Figure 3.26.

Figure 3.26 Three Side Cutting Machine

3. Zona C

- Casing in Machine

Casing in Machine is needed in the process of making a hard cover book. The speed of this machine is 40 books per hours. Casing in machine can be seen in Figure 3.27.

Figure 3.27 Casing In Machine

- Wrapping Benison Machine

PT. Kanisius has two kind of wrapping machine. One of them is wrapping benison machine that can be seen in Figure 3.28. Wrapping Benison Machine is

used to wrap the final product based on the customer order. This machine can wrap up to 1300 books per hour. The setting time is 20 minutes.

Figure 3.28 Wrapping Benison Machine

3.4.2. Production Facilities for Digital Printing

Production process for digital printing can be categorized as printing process and post-printing process. For the printing process, there are three printing machine that used in digital printing process namely Vario Print 6250, Vario Print 110, and Bizhub Press. Vario Print 6250 and Vario Print 110 are used for black and white printing order while Bizhub Press is used to print full color order as seen in Figure 3.29.

Figure 3.29 Bizhub Press Digital Printing Machine

For the post-printing process, there are several machines that can support the activities. The examples of the machines are lamination machine, 3 side cutting machine, covering machine, *jahit benang* machine, *jahit kawat* machine, etc.

CHAPTER 4
INDUSTRIAL PRACTICE PROJECT OVERVIEW

4.1. Scope of Work

During the period of internship in PT. *Kanisius*, students are placed in the *Percetakan* Division, Department of Production Planning and Inventory Control (PPIC) in the sub department of Job Scheduler and Analyzer (JSA) - *Ekspedisi*. In this sub-department, there are two main functions that are carried out, namely the process of analysis and scheduling of orders that enter from the customer and the process of distributing the finished product to the customer in accordance with the MOU that has been made with the customer. In the process of analysis and scheduling, PPIC JSA - *Ekspedisi* is also responsible for ensuring the continuity of the production process in accordance with the analysis and scheduling that has been made with the help of the Job Coordinator.

During this period of Internship, students process with several co-workers in the JSA-*Ekspedisi* Section as follows:

a. Head of Sub-deparrtment PPIC JSA – *Ekspedisi*, Mr. Pria Sasongko
b. Head of Unit PPIC JSA – *Ekspedisi*, Mr. Bambang Suprianto
c. Job Coordinator, Mr. Eko Hari
d. Analyzer, Mr. Yohanes Febru
e. Offset Printing Scheduler Offset, Mr. Vino
f. Post Printing Scheduler, Mr. Avid
g. *Ekspedisi* Team, Mr. Yuli, Mr. Wawan, dan Mr. Hantori

4.2. Responsibility and Authority in Industrial Practice

During the period of internship at PT. Kanisius, students are welcome to observe, learn and get involved in the process carried out by PPIC JSA - *Ekspedisi*. In addition, students are also given several assignments that later could help some functions in the company. The assignments given to students during the practical work period are as follows:

a. Creating an excel formulation to calculate the processing and scheduling time for post printing process in *Zona* A, *Zona* B and *Zona* C to help post-printing scheduler tasks (Mr. Avid).

b. Distribution of *Kantung Order* to assist Job Coordinator assignments (Mr. Eko and Mr. Bambang).
c. Create an excel formulation to count the number of books in 1 box of packaging (*Kerdus)* according to the size and the thickness of the book to assist *Ekspedisi* Team tasks (Mr. Yuli, Mr Wawan, and Mr. Hantori)
d. Create an excel formulation to calculate product processing time continuously for post-printing process to assist post-printing scheduler task (Mr. Avid)

In carrying out the tasks above, students were not doing these tasks regularly but depend on the needs of the company. Through these tasks, students can learn and also help the process in the sub department of PPIC JSA – *Ekspedisi*.

4.3. Work Methodology

In the previous sub-chapter, it is known that students get several tasks during the internship at PT. Kanisius. The following is a methodological explanation of each task given.

4.3.1. Calculation Program for Processing and Scheduling Time for Post Printing Process

During the period of work practice at PT. Kanisius, Head of sub department PPIC JSA – *Ekspedisi* Mr. Sasongko as field supervisor, gave the task to students for create excel formulations which later could help post-printing schedulers, Mr. Avid for the scheduling process in post-printing activity. In the post-printing section, there are 3 zones namely *zona* A, *zona* B, and *zona* C where each zone has different types of orders and machines as follows:

1. *Zona* A

- Order for Stahl 1 Folding Machine
- Order for Stahl 2 Folding Machine
- Order for MBO Folding Machine
- Order for *Jahit Kawat* Machine
- Order for Lamination Machine
- Order for HCA Machine
- Order for Die Cutting Machine
- Order for Polar Cutting Machine

2. Zona B

- Order for Set Machine
- Order for Set Manual
- Order for Jahit Benang Machine
- Order for Jahit Benang Manual
- Order for Covering Machine
- Order for 3 Side Cutting Machine
- Order for Removing Cover and Lipat Lidah
- Order for Wire Ring
- Order for Calendar Klem Big Machine
- Order for Calendar Klem Small Machine

3. Zona C

- Order for Case Making
- Order for Casing in
- *Order* for *Envelope*
- Order for Control
- Order for Wrapping Benison
- Order for Wrapping Clamco
- *Order* for Tires

Previously, the scheduling process in post-printing was only carried out for *zona* A, due to insufficient time if the post-printing scheduler had to do the scheduling for all the zones. In this regard, students are asked to make the right excel formulation, so that the scheduling process can be done in a shorter time and can cover all three zones.

Students then make observations through interviews with the post-printing scheduler, Mr. Avid, regarding the obstacles faced when the scheduler do the scheduling process. Students are then given data in the form of excel formulations which are usually used by Mr. Avid to schedule. When scheduling, Mr. Avid uses two excel files. The first excel file as seen in figure 4.1, contains a formula to calculate the processing time of an order by inputting the number of *oplah* ordered and the number of *katern* for each order. From the first excel file, it will get the processing time needed to complete one order. The processing time then inputted into the second excel file as seen in figure 4.2, which is the excel file for scheduling.

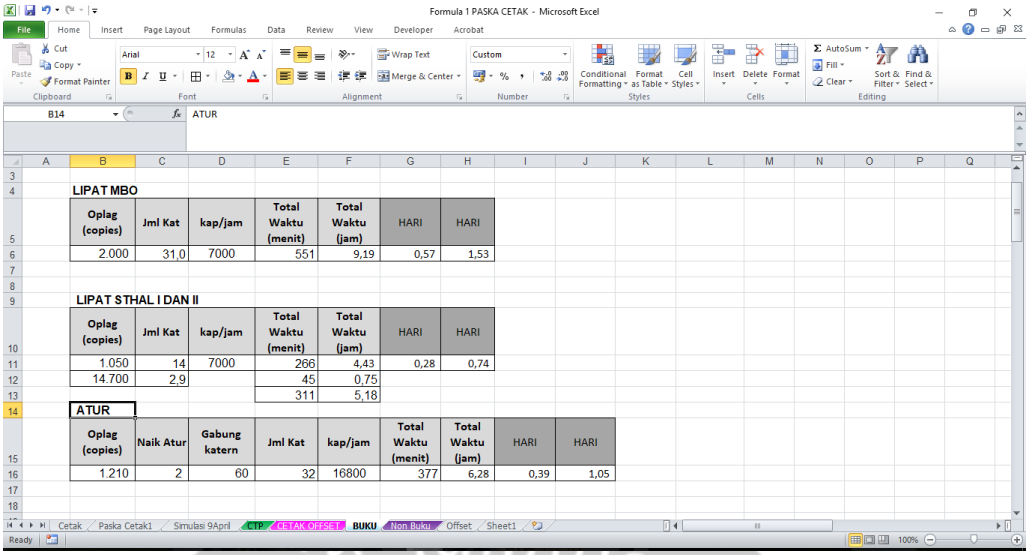


Figure 4.1. Screenshot of the First File Excel

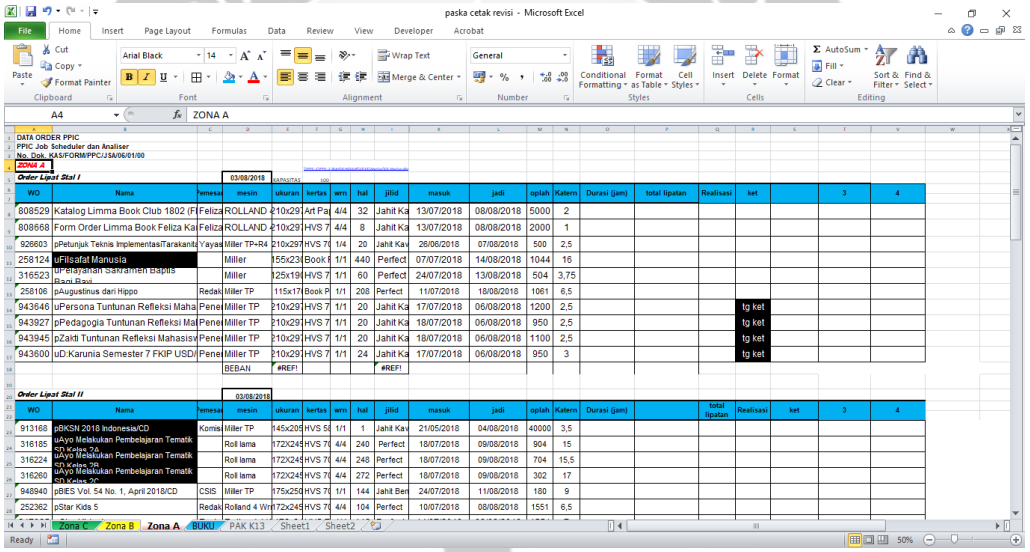


Figure 4.2. Screenshot of the Second File Excel

Based on the results of the interview, the scheduling process takes a long time because the scheduler must calculate the processing time of each order one by one with the first excel file, then input the calculation results one by one into the second excel file. In addition, the scheduler must also sort each order and make the scheduling of each order manually, which is to begin at what time the order is done, until it finishes at what time is according to the duration obtained from the first excel file. Based on these constraints, students decide to create an excel formula that can combine the two excel files and can perform scheduling calculations automatically so that it can speed up the time for scheduling in *zona* A and the scheduler can also schedule in *zona* A, *zona* B and *zona* C.

To formulate the right process time, students consult with the scheduler about how the machine works and other elements that affect the length of processing time for each order in *zona* A, *zona* B, and *zona* C. Due to the large number of machines for each zone, consultation done gradually every day. In addition to learning how each machine works, through consultation as well, students get information about working hours in the post-printing section which will be useful for making scheduling formulations related to the time of each process. The full flowchart of methodology can be seen in figure 4.3.

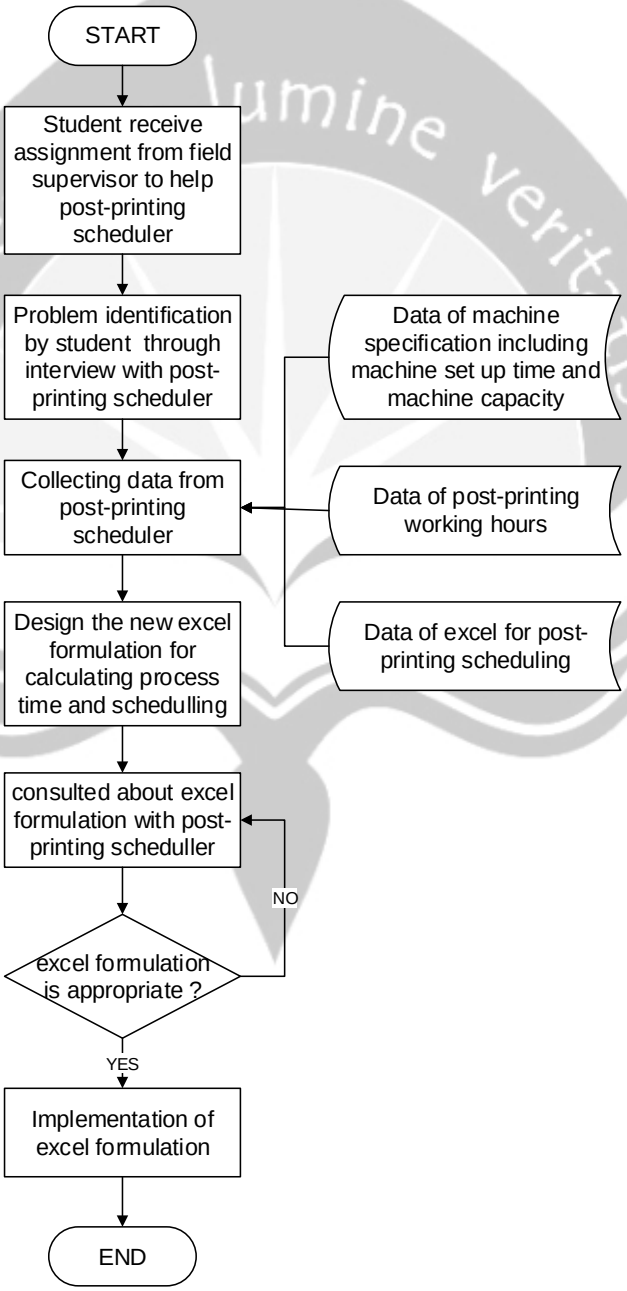


Figure 4.3. Work Methodology of Post-Printing Schedulling Project

4.3.2. Distribution of *Kantung* Order

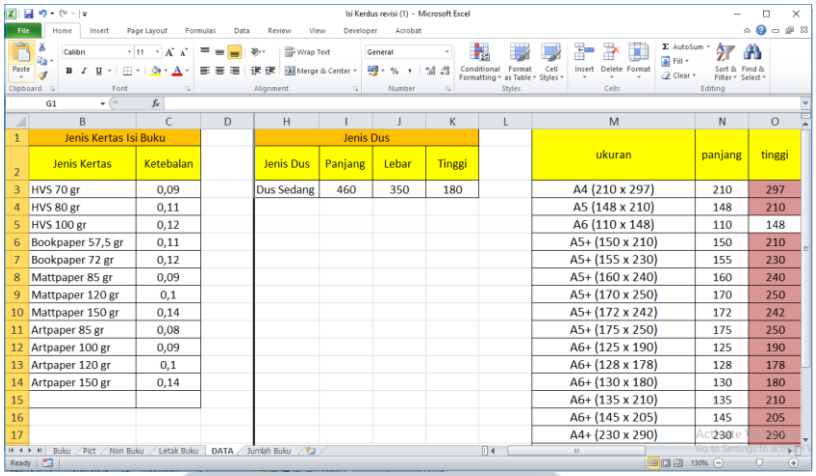
Kantung Order is a bag that contains documents such as job tickets, production planning documents, and other documents related to orders as seen in Figure 4.4. This *Kantung* Order is very important because it contains guidelines for each division in carrying out its duties related to the order. The task of delivering this *Kantung* Order is usually done by Job Coordinator.

During the internship at PT. Kanisius, students have helped several times in distributing these Kantung Order because the faster the distribution of Kantung Order, the process in the next division will run faster too. Kantung Order are usually received by PPIC JSA - *Ekspedisi* from the Marketing section, then will be used by the analyzer as a guide to making production plans and then will be distributed to other divisions depending on the type of order.

Figure 4.4. *Kantung* Order

4.3.3. Calculation Program for Count the Number of Books in One Box of Packaging (Kerdus) According to the Size and the Thickness of the Book

During the period of work practice at PT. Kanisius, the student also got the assignment from the field supervisor, Mr. Pria Sasongko to make excel formulations to calculate the contents of the kerdus according to the thickness and size of the book. To carry out this task, students are given data as seen in figure 4.5, in the form of the size of the boxes used, the size of each sheet of paper according to the type of paper, and the size of the book that is often ordered by the customer.



	B	C	H	I	J	K	M	N	O
1	Jenis Kertas Isi Buku		Jenis Dus						
2	Jenis Kertas	Ketebalan	Jenis Dus	Panjang	Lebar	Tinggi	ukuran	panjang	tinggi
3	HVS 70 gr	0,09	Dus Sedang	460	350	180	A4 (210 x 297)	210	297
4	HVS 80 gr	0,11					A5 (148 x 210)	148	210
5	HVS 100 gr	0,12					A6 (110 x 148)	110	148
6	Bookpaper 57,5 gr	0,11					A5+ (150 x 210)	150	210
7	Bookpaper 72 gr	0,12					A5+ (155 x 230)	155	230
8	Mattpaper 85 gr	0,09					A5+ (160 x 240)	160	240
9	Mattpaper 120 gr	0,1					A5+ (170 x 250)	170	250
10	Mattpaper 150 gr	0,14					A5+ (172 x 242)	172	242
11	Artpaper 85 gr	0,08					A5+ (175 x 250)	175	250
12	Artpaper 100 gr	0,09					A6+ (125 x 190)	125	190
13	Artpaper 120 gr	0,1					A6+ (128 x 178)	128	178
14	Artpaper 150 gr	0,14					A6+ (130 x 180)	130	180
15							A6+ (135 x 210)	135	210
16							A6+ (145 x 205)	145	205
17							A4+ (230 x 290)	230	290

Figure 4.5. Data Used in Calculating Box Contents

Students then study the data provided by Mr. Pria and find ways to calculate the contents of the boxes according to the data obtained using Microsoft Excel and Corel Draw software. The complete flow chart of methodology can be seen in figure 4.6.

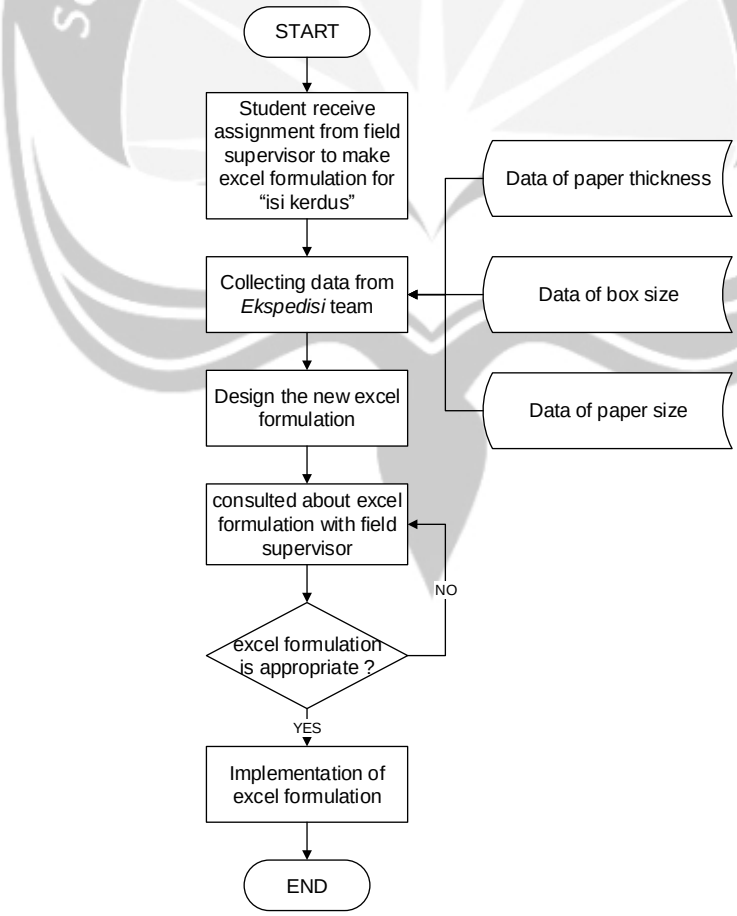


Figure 4.6 Work Methodology for Excel Formulation of "*Isi Kerdus*"

4.3.4. Calculation Program for Product Processing Time Continuously in Post-Printing Process

When getting orders in large quantities and urgent time targets, the marketing will ask the analyzer and scheduler about the time needed to complete the product until it is finished and whether the order can be completed according to the time requested by the customer. To determine the process time, it takes an excel formulation that can calculate the process time. For this reason, students are asked to help with the post-printing scheduler by creating an excel formulation that can calculate the processing time continuously. This formulation is called continue because for one type of order, there will be more than one process carried out post printing. For example, to order books with the type of finishing is perfect, the process that must be done in post-printing is folding, adjusting, covering, contouring, wrapping, and tires. But this also needs to be adjusted to the customer's request.

To complete this excel formulation, students make observations through interviews with the post-printing scheduler, Mr. Avid, about the types of orders that are most frequently entered and also the calculation of the existing processing time. Through the interview, it was known that previously Mr. Avid had made a simple calculation of process time but had not taken sev eral elements in the calculation and still used a very simple formula. Students are then given the continuous formula as seen in figure 4.7, as a reference for creating a new continues formula by considering all the elements in the post printing activity.

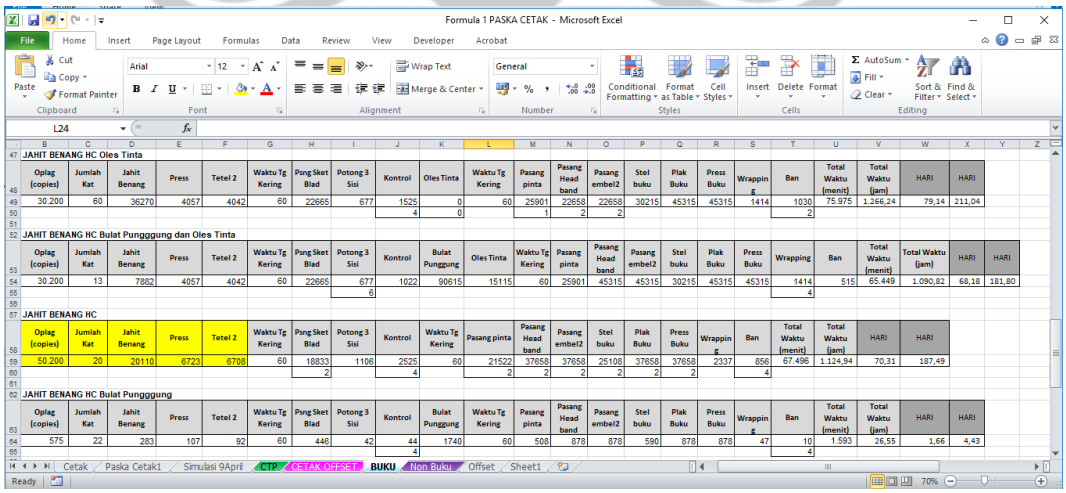


Figure 4.7 Formula Continue by Post Printing Scheduler

Through an interview with the post-printing scheduler, there were seven types of products that would continue to form formulas as follows:

1. Order for *Jahit Kawat* Binding Book
2. Order for Perfect Binding Book
3. Order for Perfect Binding Book with *Jahit Benang*
4. Order for Hard Cover Book
5. Order for Wall Calendar
6. Order for Desk Calendar
7. Order for Envelope

In making the continues formulation of the seven orders, student do consultation with the post-print scheduler every day to find out the stages and processes for each order and also the additional elements in the order**.** The flowchart of methodology can be seen in figure 4.8.

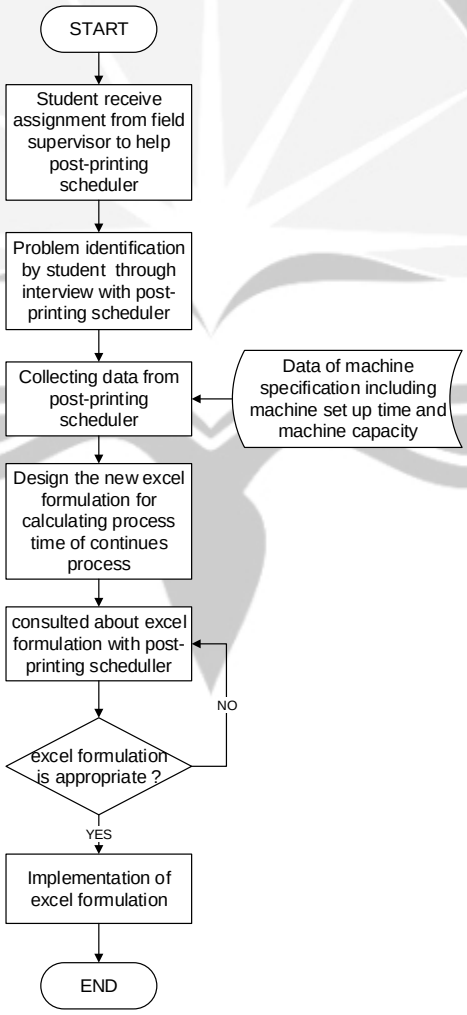


Figure 4.8 Work Methodology for Excel Continues Formulation

4.4. Working Result

From the previous sub-chapter, it has been known about the tasks obtained by the student during the practical work period at PT. Kanisius and also the methodology used. This sub-chapter will explain the results of each task that has been carried out.

4.4.1. Calculation Program for Processing and Scheduling Time for Post Printing Process

Based on the results obtained from the interview with the post-print scheduler, students create an excel formulation to calculate the processing time of each type of order in *zona A*, *zona B*, and *zona C*. The input must be inputted into each formula is the number of circulation and also the number of cards. The amount of circulation and content is obtained from the data obtained from the Analyzer. To calculate the processing time and scheduling, there are several things that must be taken into account, namely as follows:

A. Number of *Katern*

In general, there are three types of *katern* that are usually used in making books, namely a complete size *katern*, half size *katern*, and quarter size *katern*. The complete size *katern* is a katern that has a complete size and in round value, the half size *katern* is the type of katern that has half size which is usually written with a value of 0.5, while the quarter size *katern* is the type of *katern* that has quarter size which is usually written with a value of 0.15. Each type of *katern* stands alone and cannot be rounded when we calculate the processing time. For example, if the number of *katern* is 3.75, the number of fixed *katern* is not rounding up from the number, which is 4, but the system must read it into 5 cards consisting of 3 complete size *katern*, 1 half size *katern*, and 1 quarter size *katern*. The example of calculation for the number of katern can be seen in Figure 4.9.

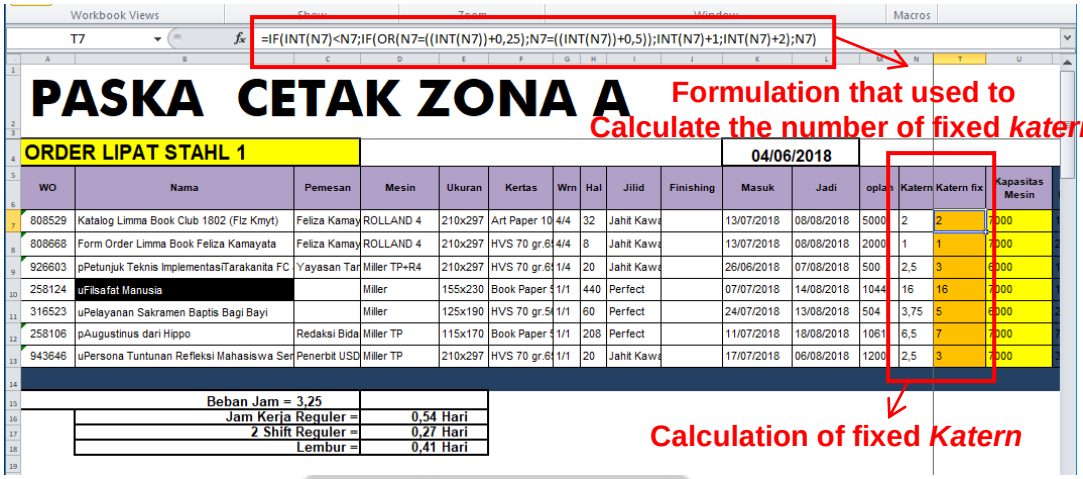


Figure 4.9 Calculation of The Number of Fixed *Katern*

B. Number of Sheets

In the previous section, it has been explained about the types of *katern* and the calculation of the number of fixed *katern*. The number of *katern* is very important as the number of sheets input. In general, the number of sheets can be calculated by the formula 4.1.

$$Number\ of\ Sheets = Number\ of\ Oplah \times Number\ of\ Katern \quad (4.1)$$

Based on this formula, if the inputs of the number of *katern* incorrectly by only 1 *katern* difference, it can affect the total number of sheets. For example, if the number of *oplah* is 1000 and the number of *katern* is 3.75 and we only round the number of the *katern* to 4, the total number of sheets will be 4000 even though the actual number of sheets is 5000 which will certainly take more time during the post-printing process. For some types of orders such as order for folding machine and set machine, the number of sheets will be one of the inputs in the calculation of processing time.

C. Imposition

In some types of orders, in calculating the number of sheets does not considering the number of *katern* but the number of imposition. In this case, the number of *katern* is not consider because, in the order, each order has only one number of *katern*, but for one katern, it can produce several *oplah* in the order. For example, for an envelope order that has four impositions, it means that in one *katern*, it can produce four envelopes. In this case, the calculation of the number of shown in formula 4.2.

$$Number\ of\ Sheets = \frac{Oplah}{imposition} \quad (4.2)$$

Based on the formula above, it can be seen that the more imposition, the smaller the number of sheets.

D. Number of Manual Workers

In the post-printing section, some work must be done manually for example controls and tires. Based on the results of consultation with the post-printing scheduler, the input is required for the number of manual workers so that the calculation of the processing time can be more accurate and flexible in accordance with the number of real workers who carry out the task. The input of the number of workers is very important because the number of manual workers in post-printing is not permanent and can be moved from one zone to another according to need.

E. The Capacity of Machine

The capacity of a machine is the speed of a machine in working on an order. In this case, PT. Kanisius has validated to calculate the speed of each process in the Post-Printing section. In the excel formula that has been made, the speed of each order that is used to calculate the processing time is placed on one sheet, namely the *Kecepatan Mesin* sheet as seen in Figure 4.10.

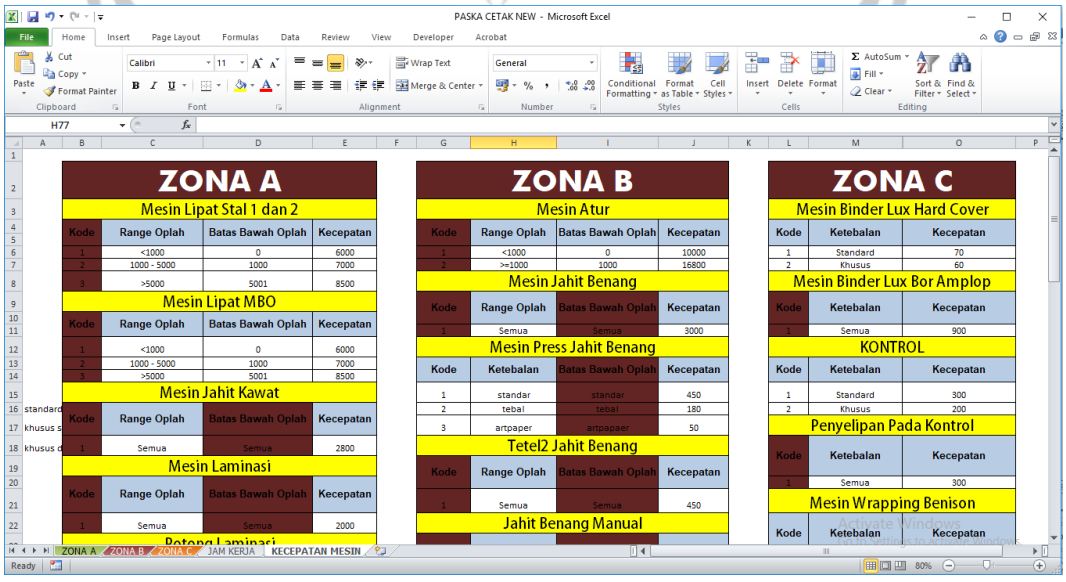


Figure 4.10 Sheet for the Speed of Machine in Each Zone

The speed of the machine is placed on one sheet to make it easier to change the speed of the machine in the calculation because the company is planning to re-

validate the speed of each machine in detail by considering the thickness of the book and other elements.

F. Realization of the Number of *Oplah* or Sheets

When do the scheduling, when an order is from the previous day, the post-printing scheduler will update how many more *oplah* or sheets have not been worked on. For that reason, in the excel formulation that has been made, there is a column to enter the value of the realization in the form of the remaining *oplah* and/or the remaining sheets as seen in figure 4.11. If the remaining *oplah* column and/or the remaining sheets are filled in, the total time will automatically be calculated by reference to the column as seen in figure 4.12, so that the time for scheduling will change more quickly following the number of *oplah* or sheets that have not been worked on.

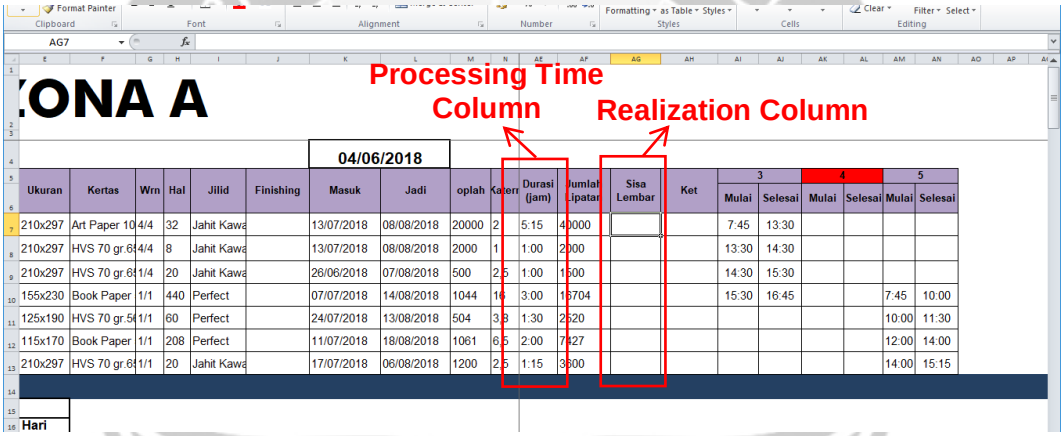


Figure 4.11 Processing Time When the Realization Column is Empty

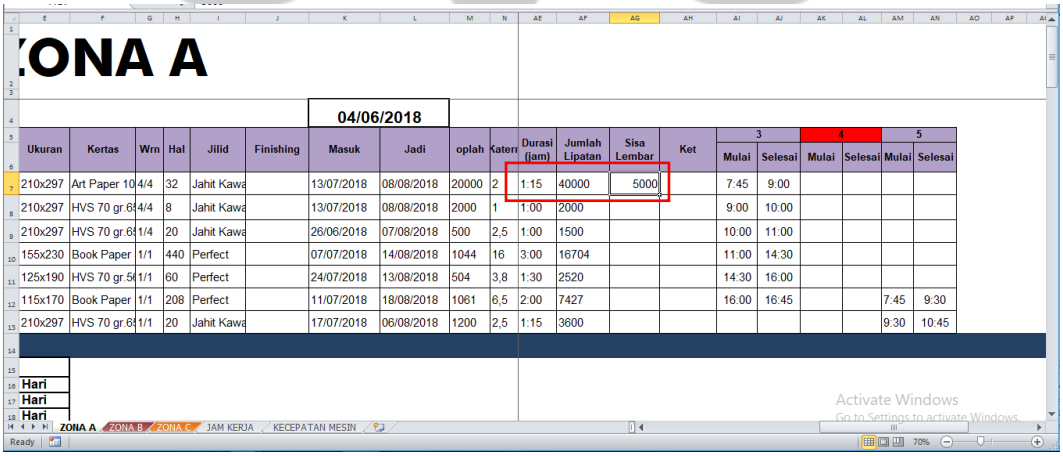


Figure 4.12 Processing Time after the Input Process of Realization

G. Processing Time

In the Post-Printing section, there are 25 different types of orders divided into 3 zones. The calculation of the processing time of each order also varies according to the state of the machine and the actual state of the field. The following is an explanation of input and also a formula for calculating the processing time of each type of order that is in the three zones:

1. Order for Stahl 1 and 2 Folding Machine

In this 1 and 2 stahl folding order, through interviews conducted by students, there are several obstacles or elements that must be considered to determining the order processing time. Before doing the folding process, the machine must be set in advance with 30 minutes. In calculating the processing time of this machine, there are two elements that must be considered, namely the Type of *katern* and the total number of sheets.

Katern type affects the processing time of this machine because for the complete, half, or quarter size of *katern* have different settings. So that every time you change the type of *katern*, it takes 10 minutes to set the machine. This also affects the total processing time. The number of sheets is also an important element because in doing one process, the maximum capacity of this machine is 5000 sheets so that when the number of sheets in an order is more than 5000 sheets, it will take 5 minutes to set the paper and input the paper.

Based on those elements, to calculate the processing time, the formulation that used can be seen in formula 4.3.

$$\begin{aligned} \textit{Processing Time} = & \left(\frac{\textit{Number of Sheets}}{\textit{The Capacity of Machine}} \right) + \textit{Initial Setting Time} \\ & + \textit{Setting time for adding sheets} \\ & + \textit{Setting time for changing the katern} \end{aligned} \tag{4.3}$$

Based on that formulation, the excel formulation of the processing time can be made as follows:

```
=(IF(V7>5000;(V7/(U7/60))+30+(5*(T7-INT(N7))*(ROUNDUP(V7/5000;0)-
1))+(10*(T7-INT(N7)));(V7/(U7/60))+30+(10*(T7-INT(N7)))))/60
```

- Order for MBO Folding Machine

MBO folding machines have different working principles with Stahl 1 and 2 folding machines. The time for the initial engine setting is 20 minutes. The number of

sheets that must be inputted is not limited to 5000 sheets so there is no limit to the number of sheets. For type of *katern*, if there is more than one type of *katern*, the reset time for the engine is also needed for 10 minutes. Based on these considerations, the formula that used to calculate the processing time can be seen in formula 4.4.

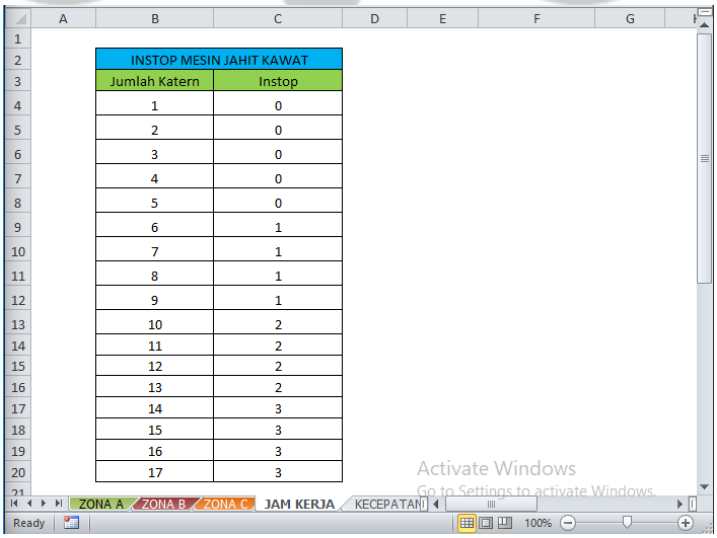
$$Processing\ Time = \left(\frac{Number\ of\ Sheets}{The\ Capacity\ of\ the\ Machine}\right) + Initial\ Setting\ time + Setting\ time\ for\ changging\ katern \quad (4.4)$$

From that formulation, the calculations in form of excel calculation as follows:

```
=((V37/(U37/60))+20+(10*(T37-INT(N37))))/60
```

- Order for *Jahit Kawat* Machine

For the order of *Jahit Kawat* Machine, the initial setting time for the machine is 45 minutes. The working principle of this machine is that this machine performs two functions, namely set the *katern* and *jahit kawat*. But the setup process on this machine has a limitation, that is, the set process is limited to orders that have a maximum fixed number of 5 *katern*. For orders that have more than 5 *katern*, the instop process must be done. This instop process is a lot of regulating processes that are carried out to combine all cards in one order. Data regarding the number of instops based on the number of cards has been entered into the *jahit kawat* machine instop table contained in the *JAM KERJA* sheet as seen in figure 4.13.



INSTOP MESIN JAHIT KAWAT	
Jumlah Katern	Instop
1	0
2	0
3	0
4	0
5	0
6	1
7	1
8	1
9	1
10	2
11	2
12	2
13	2
14	3
15	3
16	3
17	3

Figure 4.13 Instop Table of *Jahit Kawat* Machine

Based on that limitation, the formulation that uses to calculate the processing time of the machine can be seen in formula 4.5.

$$Processing\ Time = \left(\frac{Number\ of\ Oplah}{Machine\ Capacity}\right) \times (1 + Number\ of\ instop) + initial\ setting \quad (4.5)$$

Number 1 in the calculation is to describe the number of setting process for the machine before the instop process. from the formulation, the excel formulation can be made as follows

```
=IF(VLOOKUP(S50;'JAM
KERJA'!$B$4:$C$20;2;FALSE)>=1;((((R50/U50)*60)*(1+(VLOOKUP(S50;'JAM
KERJA'!$B$4:$C$20;2;FALSE))))+45)/60;(((R50/U50)*60)+45)/60)
```

- Order for Lamination Machine

To calculate the processing time of the lamination orders, the factors that must be considered are the imposition and the number of side. The number of side is one important factor because some incoming orders are cover and require lamination for both side of the paper so that the processing time is doubled. In processing lamination orders, there are several additional processes, namely cutting and waiting to dry. The cutting process is a manual work so that it is given input for the number of cut workers. The formulation of the Lamination Order time calculation can be seen in formula 4.6.

$$Processing\ Time = \left(\frac{Number\ of\ Process \times}{(Processing\ Time + Cutting\ Process\ Time)}\right) - Initial\ setting\ time\ for\ lamination\ machine + Time\ for\ Drying \quad (4.6)$$

For above formulation, the excel formulation for the total processing time as follows:

```
=IF(P63=2;((P63*(R63+V63))-
(22/60)+(S63/60))/O63;(R63+(S63/60)+V63)/O63)
```

- Order for HCA and Die Cutting Machine

HCA and die cutting orders have similarities in the calculation of processing time. Both of these machines have several important elements, namely the *katern*, imposition and number of processes. When the *katern* value is one, the number

of sheets will be calculated based on the imposition, whereas if the number of *katern* is more than one, then the calculation of the number of sheets will based on the *katern* number. So, the excel formula used for the number of sheets is as follows:

```
=IF(Q89=1;T89/R89;T89*Q89)
```

The number of processes is also an important element for calculating process time because some orders require for die cutting or HCA more than once. The machine setting time for HCA and die cutting is different for HCA the setting time is 45 minutes, while for die cutting is 30 minutes. Overall, to calculate the HCA or die cutting processing time, the excel formula is used as follows:

```
=(((P76/(V76/60))+(45))/60)*S76
```

The excel formula used above is to calculate the time of the HCA process so that the setting time used is 45 minutes. Simply put, the formulation used to calculate the time of the HCA and Die cutting process can be seen in formula 4.7.

$$Processing\ Time = \left(\left(\frac{Number\ of\ Sheets}{Machine\ Capacity}\right) + Initial\ Setting\ Time\right) \times Number\ of\ Process \quad (4.7)$$

- Order for Polar Cutting Machine

In calculating the processing time for a polar cutting machine, there is no special element that must be taken into account so that the time calculation uses the basic formula can be seen in formula 4.8.

$$Processing\ Time = \left(\left(\frac{Number\ of\ Sheets}{Machine\ Capacity}\right) + Initial\ Setting\ Time\right) \quad (4.8)$$

- Order for Set Machine

In the process of a set machine order, there is one important element that must be considered, namely the number of *katern*. On this set machine, there is only a place to enter 16 *katern*. For orders with more than 16 *katern*, it must be done several times to set up depending on the number of *katern*. For more than one set up, manual work is needed to set the remaining *katern* so that the manual time must be calculated in the calculation of the processing time. The initial setting time of the machine is 20 minutes. To calculate the time on a set machine order, the formula used can be seen in formula 4.9.

$$Processing\ Time = \left(\frac{Number\ of\ Sheets}{Machine\ Capacity}\right) + Initial\ Setting\ Time + Manual\ Work\ Time \quad (4.9)$$

In that formulation, the manual working time will be valued as zero if the set up time is just done once or the number of *katern* is less than 16 *katern.*

- Order for Set Manual

Order for set manual does not have special elements that must be taken into account in calculating the processing time. However, the process of manual order ordering is usually carried out by a group of people so that the number of groups needs to be considered in this process. In calculating the processing time, the formula used can be seen in formula 4.10.

$$Processing\ Time = \left(\frac{Number\ of\ Oplah}{Machine\ Capacity}\right) \div Number\ of\ Groups \quad (4.10)$$

- Order for *Jahit Benang* Machine and Manual

Order for Jahit Benang Machine and Manual are generally the same, only different in the type of sewing machine used and the speed of sewing. In the execution of both, there is a continuous process that occurs that is the process of *jahit benang* with the machine, press, tetel-tetel, and wait dry. In this ongoing process, there is often an overlap, that is, when the first process has not been completed, the second process has already begun and so on. Because of this, the calculation of the process time must also take into account this overlap process. Through discussions with the post-print scheduler, the overlap process can be illustrated in figure 4.14.

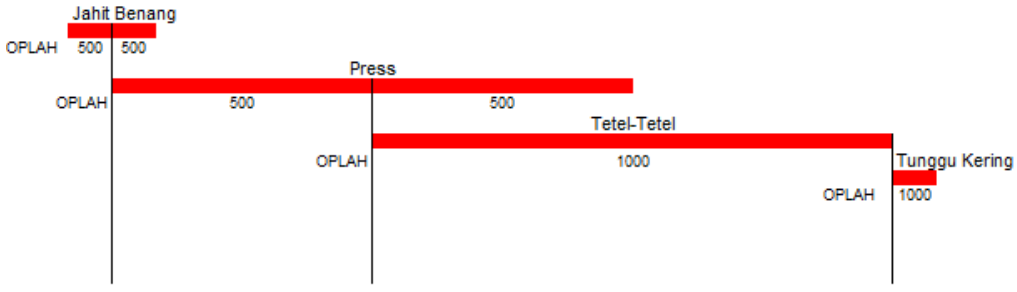


Figure 4.14 Illustration of the Overlap in *Jahit Benang* Order

Through the above illustration, it can be seen that the formula used to calculate the processing time in *jahit benang* is to add up the time of the fourth process of

the process, assuming overlap occurs when the first station starts working on 500 orders. If the number of orders is less than 500 orders, the formula for calculating the processing time does not considering the overlap.

- Order for Covering Machine

Covering Order has 2 types, namely the usual cover and tongue cover. On ordinary cover, only one cover is done. However, for the tongue cover, the cover process is done twice. Based on these considerations, the formula used to calculate the cover order processing time is shown in formula 4.11.

$$Processing\ Time = \left(\left(\frac{Number\ of\ Oplah}{Covering\ Speed} \right) + Initial\ Setting\ Time \right) \times Number\ of\ Process \quad (4.11)$$

The initial setting time for covering machine is 20 minutes in average.

- Order for 3 Side Cutting Machine

A 3 side cut order is usually used in the book making process. In the calculation of the 3 side cutting time, consideration of the number of processes is also used because there are several orders that require twice the cutting process. The formula used can be seen in formula 4.12.

$$Processing\ Time = \left(\left(\frac{Number\ of\ Oplah}{Machine\ Capacity} \right) + Initial\ Setting\ Time \right) \times Number\ of\ process \quad (4.12)$$

The initial setting time for the 3 side cutting machine is 30 minutes in average.

- Order for Removing Cover and Lipat Lidah

Order for removing cover and *lipat lidah* is an additional process in making books with tongue cover. In this order, there are two types of orders, namely the ordinary perfect tongue folding book and the perfect tongue folding book with *jahit benang*. To order with *jahit benang*, no process is needed to remove the cover, whereas in the perfect book with the tongue, the process of removing the cover is needed. Removing cover and *lipat lidah* is a manual job so that the number of workers also affects these two processes.

- Order for Wire Ring

Wire Ring Order is a process for making desk calendars. The process carried out in this type of order is also an ongoing process which consists of porphoration, spiral cutting, spiral pairs, and spiral clamps. The porphoration process is a

process of punching paper so that it is easier to install a spiral. The porphoration process can be done more than once depending on the type of paper, thickness, and size so that students provide input for the number of porphorations. The process of porphoration and spiral clamps is done with a machine with the same initial setting time of 30 minutes.

For the other processes, the processes are done manually so that the number of workers is an important factor in calculating the processing time.

- Order for Calendar Clamping Big and Small Machine

PT. Kanisius has 1 big clamping machine and many small clamping machines. This clamping machine is usually used to work on wall calendar orders. The calculation of the processing time for these two machines is generally the same, it's just that for the small machine calendar clamps are given the input number of machines because there is more than one number. The formulation of the calculation of the processing time can be seen in formula 4.13.

$$Processing\ time = \left(\left(\frac{Number\ of\ Oplah}{Machine\ Capacity}\right) + Initial\ Setting\ \ Time\right) \div Number\ of\ Machine \quad (4.13)$$

The initial setting time for the small clamping machine is 30 minutes in average, and for the large clamping machine is 10 minutes in average.

- Order for Case Making

In calculating the order time for case making, there is no special element that must be considered so that the formulation of the process time shown in formula 4.14.

$$Processing\ time = \left(\left(\frac{Number\ of\ Oplah}{Machine\ Capacity}\right) + Initial\ Setting\ \ Time\right) \quad (4.14)$$

The initial setting time of the case making process is 45 minutes in average.

- Order for Casing in

The casing in process is one of the processes in the hard cover book for the contents of the book. In this type of order there are also many stages that occur, namely the installation of skip blad, cut 3 sides, control, attach the tape, install the capital, attach the attachment, and finally the casing in process using the machine. In this process, what is done with the machine is only cutting 3 sides and the casing in with the same initial setting time of 30 minutes. In this process

there is also a process that can be removed depending on the order from the customer, that is, attach the ribbon.

- *Order* for *Envelope*

In the execution of envelope orders, there are continues process that occurs namely folding, glue, drill, beard and window stick. However, to drill, beard and paste the window, the process depends on customer demand and is not always there. From these processes, drill and beard are processes using machines while others are manual processes so that the number of workers is also an important input.

- Order for Control

Order Control is a manual order consisting of several processes namely control, *penyelipan*, and tires. For *penyelipan* and tires are not always available so that the formula can be removed if it is not needed. Because all the processes are manual processes, then the input of workers is needed.

- Order for Wrapping Benison and Clamco

In calculating the time of the wrapping process, the important element is the number of *oplah* in 1 wrapping because there are several requests wrapping with the number of *oplah* in one wrapping more than one. The formulation for calculating the time of the wrapping process is shown in formula 4.15.

$$Processing\ time = \frac{\frac{Number\ of\ Oplah}{Number\ of\ oplah\ in\ 1\ wrapping}}{The\ Speed\ of\ Wrapping\ Process} + Initial\ Setting\ time \quad (4.15)$$

The initial setting time for the wrapping benison machine is 20 minutes in average and for wrapping clamco machine is 30 minutes in average.

- *Order* for Tires

In calculating tire processing time, the principle of calculation is almost the same as wrapping machines, only the tire order is manual work. In the tire order also required input amount of *oplah* in one tire and because the process is manual, then the number of workers is also needed. The formulation used to calculate this tire order is shown in formula 4.16.

$$Waktu\ Proses = \frac{\frac{Number\ of\ Oplah}{Number\ of\ Oplah\ in\ every\ tire}}{Tire\ Speed} \div Number\ of\ Manual\ Workers \quad (4.16)$$

Through the calculation of the processing time described in the above points, the processing time of each order will be obtained. From the time of this process, scheduling will be made for each order using the shift code.

H. Shifting Code

In the post-printing section, the working hours that are usually used are regular working hours, from 7.30 to 15.00. However, when many orders must be completed, to pursue existing production targets, overtime is needed or additional shifts are needed. This cause, working hours on the post-printing section can vary each day. In preparing post-print scheduling, it is necessary to know in advance the shift that will be used on that day. In the excel formulation that has been made, a choice of working hours is placed on the *JAM KERJA* sheet as seen in figure 4.15. On this sheet 3 additional clock shift codes are created to make the work shift more flexible.

PILIHAN JAM KERJA							
Kode	Jenis Jam Kerja	Mulai	Selesai	Istirahat 1		Durasi Istirahat	Durasi Jam Kerja
1	Biasa Reguler	7:45	14:45	11:30	12:00	0:30	6
2	Biasa Lembur	7:45	16:45	11:30	12:00	0:30	8
3	Biasa shift	6:45	20:45	10:00	10:30	1:00	12
4	Sabtu Reguler	7:45	12:15	0:00	0:00	0:00	4
5	Sabtu Lembur	7:45	14:45	11:30	12:00	0:30	6
6	Sabtu Shift	6:45	15:45	0:00	0:00	0:00	4
7	Libur	7:45	7:45	0:00	0:00	0:00	0
8	Libur	7:45	7:45	0:00	0:00	0:00	0
9	Libur	7:45	7:45	0:00	0:00	0:00	0
10	Libur	7:45	7:45	0:00	0:00	0:00	0

Figure 4.15 List of the Shifting Codes that Used for the schedulling

Scheduling for post-printing section is usually arranged every three days. Because of that, the excel formulation that has been made by students, for each order is given 3 shift code columns which will affect the scheduling column on the right side as seen in figure 4.16.

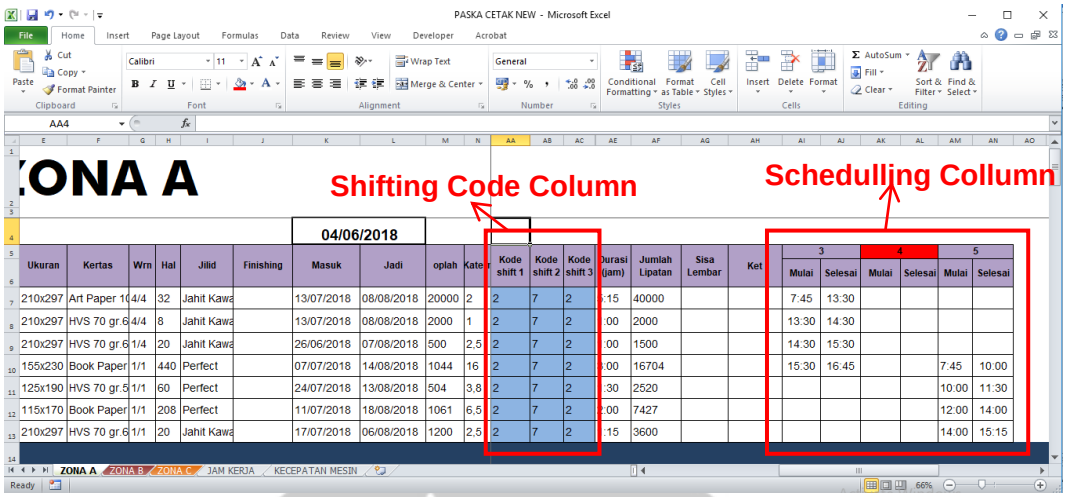


Figure 4.16 Column for Shifting Code and Scheduling

In the excel formula that has been created, the scheduling column will be automatically changed when the shift code is replaced because both have been linked to a table of working hours that are on the *JAM KERJA* sheet so that it can simplify the scheduling process.

I. Scheduling

After knowing all the points above, an excel formula was made that can combine all of these points to make scheduling for each order. The explanation for the excel formulation can be seen in Appendix 2.

4.4.2. Distribution of Kantung Order

In the distribution of the *kantung* order, the thing to do is to deliver *kantung* order as quickly as possible to increase the work productivity of each production element. In this case the student always delivers the *kantung* order right after being asked to deliver the *kantung* order. Students deliver *kantung* order to several departments, namely CTP, logistics, and PJC.

4.4.3. Calculation Program for Count the Number of Books in One Box of Packaging (Kerdus) According to the Size and the Thickness of the Book

The results of the excel formulation for calculating the number of books in one box of packaging can be seen in figure 4.17. In the excel formulation, the white column is a column that can be filled manually according to the type of book that will count the contents of the *kerdus*.

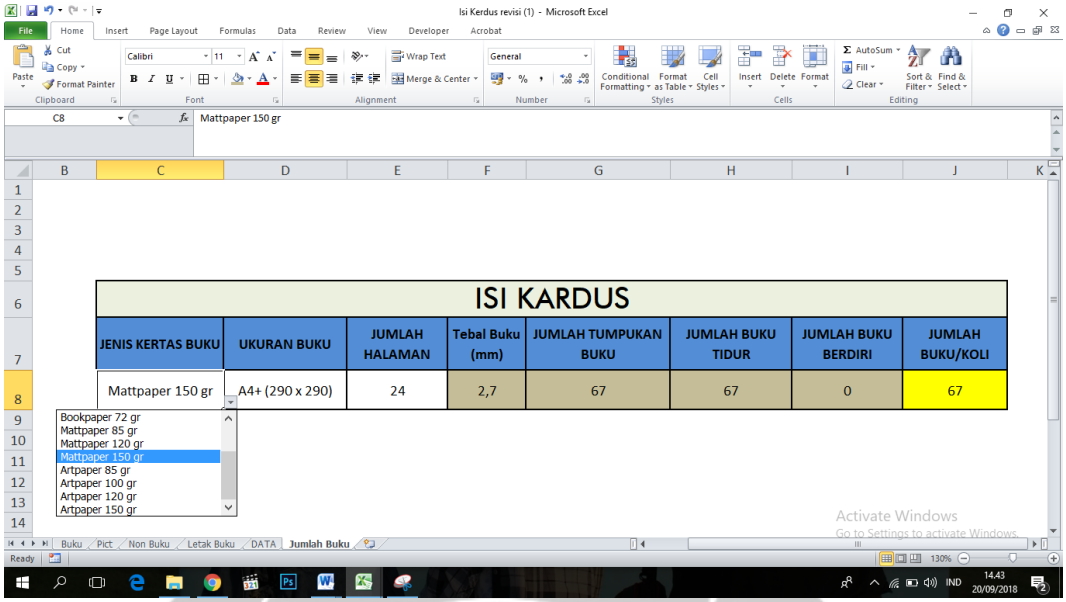


Figure 4.17. Result of Calculation of the Content of *Kerdus*

The gray column is a column that shows the results of the formula calculation, namely the thickness of the book for one book, the number of stacks of books that have been adjusted to the thickness of the book unit and the height of the box, as well as the number of sleeping books and the number of books standing. For thick book calculations, the excel formula is used as follows:

```
=((E8*VLOOKUP(C8;DATA!$B$3:$C$14;2;FALSE))/2)+1
```

The formulation can be simply with the formula 4.17.

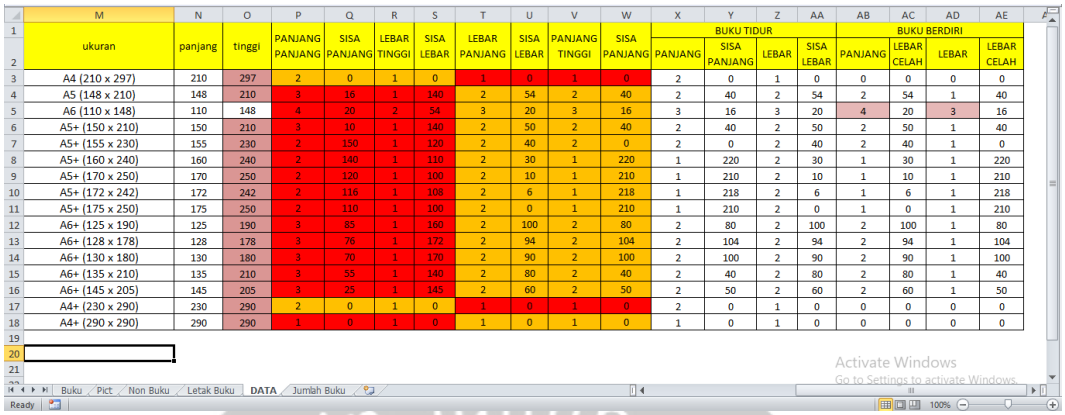
$$Thickness\ of\ the\ book = \frac{(Number\ of\ Pages \times thickness\ of\ one\ sheet\ of\ paper)}{2} + 1 \quad (4.17)$$

The number 1 is the thickness of the cover because in this case, there is no validation for calculating the thickness of each type of cover paper so that the thickness of the cover is equaled to 1 mm. The number of pages must be divided by two sheets of paper having two pages back and forth. For the calculation of the number of stack books, the excel formula used is as follows:

```
=ROUNDDOWN((DATA!$K$3)/F8;0)
```

In simple terms, the formula is rounding up from the height of the *kerdus* divided by the thickness of one book. For the calculation of the number of sleeping books

and standing books, calculations for each book size in the table are included in the data sheet in figure 4.18.



	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
1												BUKU TIDUR				BUKU BERDIRI			
2	ukuran	panjang	tinggi	PANJANG PANJANG	SISA PANJANG	LEBAR TINGGI	SISA LEBAR	LEBAR PANJANG	SISA LEBAR	PANJANG TINGGI	SISA PANJANG	PANJANG	SISA PANJANG	LEBAR	SISA LEBAR	PANJANG	LEBAR CELAH	LEBAR	LEBAR CELAH
3	A4 (210 x 297)	210	297	2	0	1	0	1	0	1	0	2	0	1	0	0	0	0	0
4	A5 (148 x 210)	148	210	3	16	1	140	2	54	2	40	2	40	2	54	2	54	1	40
5	A6 (110 x 148)	110	148	4	20	2	54	3	20	3	16	3	16	3	20	4	20	3	16
6	A5+ (150 x 210)	150	210	3	10	1	140	2	50	2	40	2	40	2	50	2	50	1	40
7	A5+ (155 x 230)	155	230	2	150	1	120	2	40	2	0	2	0	2	40	2	40	1	0
8	A5+ (160 x 240)	160	240	2	140	1	110	2	30	1	220	1	220	2	30	1	30	1	220
9	A5+ (170 x 250)	170	250	2	120	1	100	2	10	1	210	1	210	2	10	1	10	1	210
10	A5+ (172 x 242)	172	242	2	116	1	108	2	6	1	218	1	218	2	6	1	6	1	218
11	A5+ (175 x 250)	175	250	2	110	1	100	2	0	1	210	1	210	2	0	1	0	1	210
12	A6+ (125 x 190)	125	190	3	85	1	160	2	100	2	80	2	80	2	100	2	100	1	80
13	A6+ (128 x 178)	128	178	3	76	1	172	2	94	2	104	2	104	2	94	2	94	1	104
14	A6+ (130 x 180)	130	180	3	70	1	170	2	90	2	100	2	100	2	90	2	90	1	100
15	A6+ (135 x 210)	135	210	3	55	1	140	2	80	2	40	2	40	2	80	2	80	1	40
16	A6+ (145 x 205)	145	205	3	25	1	145	2	60	2	50	2	50	2	60	2	60	1	50
17	A4+ (230 x 290)	230	290	2	0	1	0	1	0	1	0	2	0	1	0	0	0	0	0
18	A4+ (290 x 290)	290	290	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0
19																			
20																			
21																			

Activate Windows
Go to Settings to activate Windows.

Buku | Pict | Non Buku | Letak Buku | DATA | Jumlah Buku

Ready

Figure 4.18. Calculation for the Sleeping and Standing Position Books

From the table in Excel above, the orange color represents the most efficient placement. Students also make sample drawings for A4, A5 and A6 size books using the help of Corel Draw software as seen in figure 4.19.

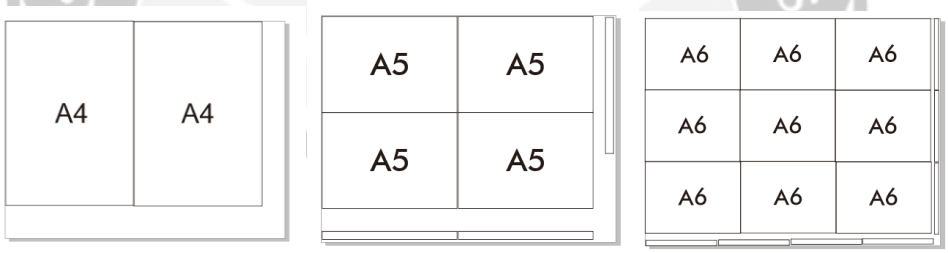


Figure 4.19. The Placement of the Books for A4, A5, and A6 size

After knowing the thickness of the book for one book, the number of piles of books that have been adjusted to the thickness of the book unit and the height of the *kerdus*, as well as the number of sleeping books and number of books stands, in figure 4.13. There is a yellow column which is the number of contents of the final kerdus which is calculated by adding up the number of sleeping books and the number of books standing.

4.4.4. Calculation Program for Product Processing Time Continuously in Post-Printing Process

In the previous section, students have been asked to make a formulation to calculate each order in post-print *zona* A, B, and C. In this subchapter, the results obtained are the merging of several types of orders to complete

one complete order on post-printing section. The types of continuing processes that are made in this continue formulas are as follows:

A. Order for *Jahit Kawat* Binding Book

In making a *jahit kawat* book order, the post-printing process that is carried out is the process of folding, *jahit kawat*, control and tires, and wrapping. To calculate the processing time of this type of order, the process time formula that has been made in the previous sub-section is used, and then the total time the process has been done.

B. Order for Perfect Binding Book

In making an order for an ordinary perfect binding book, the process needed to complete the order in the post-printing process is the process of folding, setting, covering, control and tire, as well as wrapping. To calculate the processing time, a total of all process times are carried out.

C. Order for Perfect Binding Book with *Jahit Benang*

To complete the order for the perfect book with *jahit benang* in the post-print, several processes are carried out namely folding, setting, *jahit benang*, covers, controls and tires, as well as wrapping. To calculate the overall processing time, the sum is performed for each time the process is carried out.

D. Order for Hard Cover Book

In making a hard cover book order, the post-printing process is done by folding, setting, *jahit benang*, casing in, and wrapping. The calculation of the entire process time is done by adding up the processing time of each post-print process.

E. Order for Wall Calendar

Order for wall calendar is a little different from previous orders. The post-print process that is done is the cutting process, manual setting, clamps, and tires. To calculate the overall process time is done by adding up the time of the entire process.

F. Order for Desk Calendar

Order for desk calendar in the same direction as the wall calendar. The process that is carried out in the post-print process is the cutting process, manual setting, and wire and tire ring. To calculate the overall time is also carried out the sum of the time of each process carried out in the post-print.

G. Order for Envelope

In the execution of envelope orders, the post-printing process that is done is the lamination process, pound, cut, envelope making and tire. To calculate the overall processing time, there is also the sum of all post-print processes.

CHAPTER 5
CONCLUSION AND SUGGESTION

This chapter will mention the conclusions and the suggestions for the potential improvement for the company that found by student during the period of internship in PT. Kanisius.

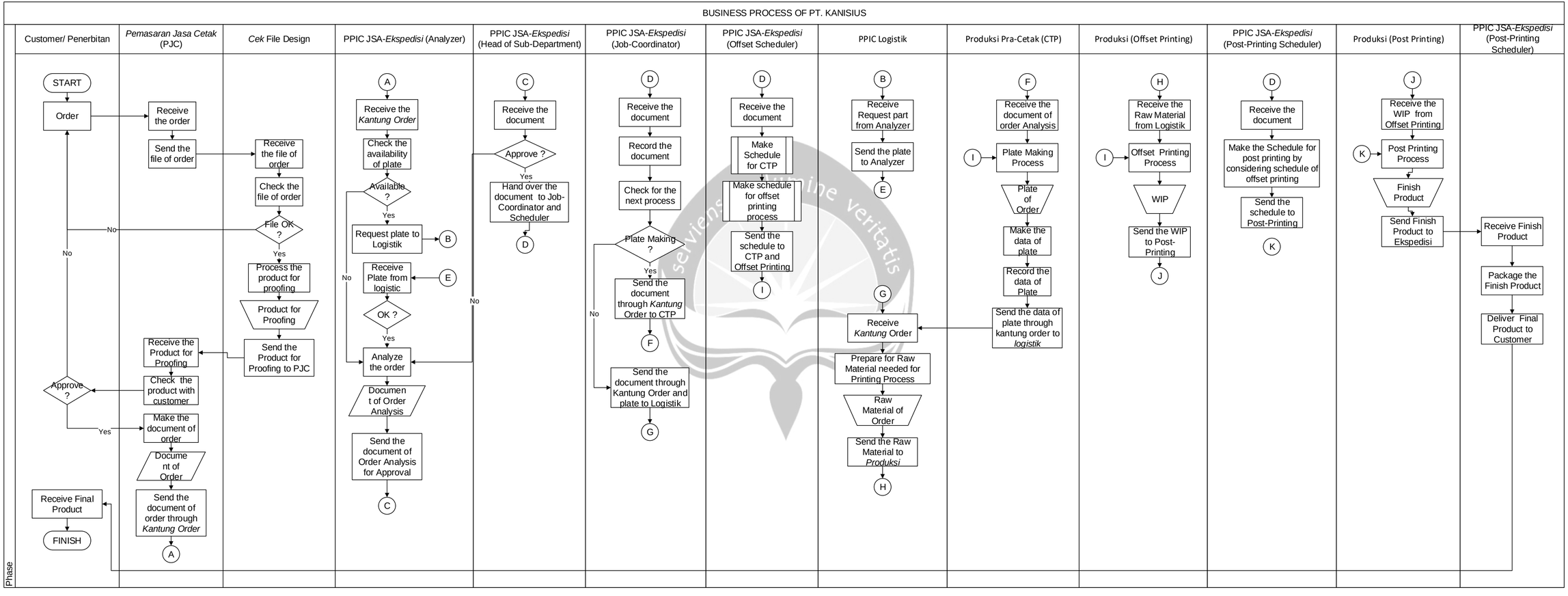
5.1. Conclusion

a. Student can adapt with the working atmosphere in the company and interact with the workmate
b. Student can learn and observe the daily work in PT. Kanisius as well as involved in the working activity at the company especially in PPIC department
c. Student can understand about the scope of the company as well as the business process of the company.
d. Student are able to finish the entire task that given by the supervisor from the company.
e. The current system and organizational structure of the company are well integrated.
f. In term of production facilities, PT. Kanisius has been equipped with various machines that can support the production process well.
g. The current validation of the machine is not really accurate compare to the field condition.
h. The qualification of the worker is still not able to keep abreast of existing technology compared to the other printing companies

5.2. Suggestion

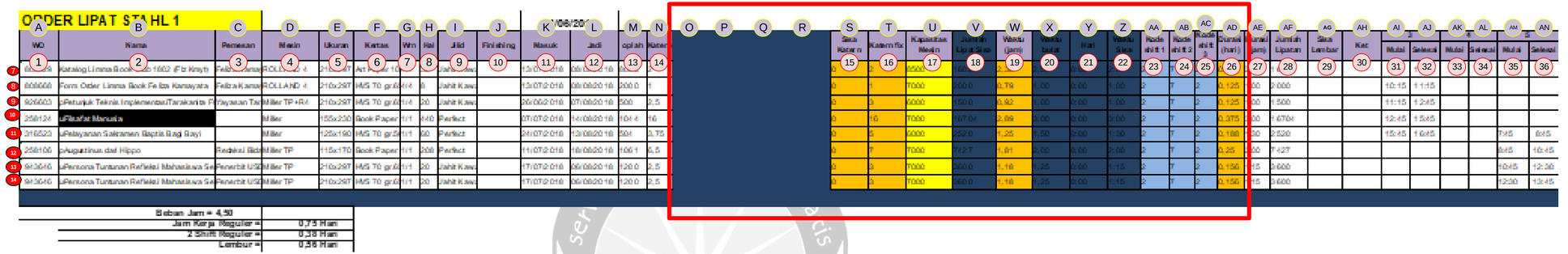
a. Conduct re-validation in terms of the capacity for each machine in detail with considering the type of the paper so that the calculation of processing time becomes more accurate.
b. Conduct training for the employee to improve the skills of the worker.

Appendix 1. Business Process of PT. Kanisius



Appendix 2 Explanation of the Table

- A = Number of Collumn in Excel Formulation
- 1 = Number of Collumn in Explanation bellow
- 7 = Number of Row in Excel Formulation
- Collumn that used to simplify formulation
- Collumn that contain formulation
- Collumn input taken from the data that important for formulation
- Collumn that need input from scheduller



1. **Collumn 1 – 12** = data of the order from the company

2. **Collumn 13 and 14** = input for the calculation

3. **Collumn 15** = Number of Remain Katern for one oplah
ROUNDUP((AG10)/M10;0) roundup the remain katern that shown in collumn 26 divided by the number of oplah in colomn 13 to know the rest of the katern for one oplah that have not been processed.

4. **Collumn 16** = Fix Number of Katern
IF(INT(N7)<N7;**IF(OR(N7=((INT(N7))+0,25);N7=((INT(N7))+0,5));INT(N7)+1;INT(N7)+2)**;N7)
IF(INT(N7)<N7; (Show the first condition. if the number of katern is a decimal number, go to the next condition, if the number of katern is not a decimal number, go to the third condition which is the fix number of katern will be the same with the input katern in collumn 14.
IF(OR(N7=((INT(N7))+0,25);N7=((INT(N7))+0,5));INT(N7)+1;INT(N7)+2); There are three type of katerns which are whole size katern (not decimall), the half size katern (0,5) and quarter size katern (0,25), therefore, the formulation in the second condition is if the value of katern number is 0,25 or 0,5, the fix number of katern will be add with 1 katern, but if the number is not both of it which is 0,75, then the fix number will be add with 2.

5. **Collumn 17** = Machine Capacity
=VLOOKUP(M7;'KECEPATAN MESIN'!$D$6:$E$8;2) this will be show the machine capacity based on the data in sheet KECEPATAN MESIN

6. **Collumn 18** = The number of remain katern
=IF(S7=0;M7*T7;AG7) this collumn is just for simplify the calculation of processing time. If collumn 29 is empty, this collumn will automatically show the number of katern for those order. But if collumn 29 has value, the value will be shown.

7. **Collumn 19** = Processing Time
=(IF(V7>5000;(V7/(U7/60))+30+(5*(T7-INT(N7))*(ROUNDUP(V7/5000;0)-1))+(10*(T7-INT(N7)));(V7/(U7/60))+30+(10*(T7-INT(N7))))/60
This collumn show the processing time of folding machine of STAHL 1, the complete explanation of the processing time of folding machine of STAHL 1 and 2 explain in chapter 4.

8. **Collumn 20** = Round for Processing Time
=IF((INT(W7)+(1/4))<W7;**IF((INT(W7)+(1/2))<W7;*IF((INT(W7)+(3/4))<W7;ROUNDUP(W7;0);INT(W7)+(3/4))*;INT(W7)+(1/2))**;INT(W7)+(1/4)) based on the interview with the scheduller, to simplify the time for schedulling, all the processing time is round up to the nearest 15 minutes

9. **Collumn 21** = The rest of time for one day
=(ROUNDDOWN(X7/24;0))*'JAM KERJA'!$B$26 this collumn is for simplify the calculation of time for schedulling.

10. **Collumn 22** = The rest of time withourt the day
=IF((ROUNDUP(X7;0)>X7);IF((INT(X7)+(3/4))>X7;IF((INT(X7)+(1/2))>X7;TIME(INT(X7);15;0);TIME(INT(X7);30;0));TIME(INT(X7);45;0));TIME(X7;0;0)) this collumn is used to change the processing time that allready roundup in decimal into the time format in excel for simplify the schedulling process

11. Collumn 23 – 25 = Shift Code
This collumn is the input from the scheduller related to the working hours for the schedulling. Shift code 1 is for first day, shift code 2 is for the second day, and so on.

12. Collumn 26 = Processing time (day)
=X7/(VLOOKUP(AA7;'JAM KERJA'!$I$4:$P$13;8;FALSE)) this collumn is show how many day needed to finish one order using the data of total processing time in collumn 20 divided by the total working hour in one day using the data of shift code 1 in collum 23.

13. Collumn 27 = Processing Time (hours)
=Y7+Z7 this collumn show the total processing time in hours with the format time that will be used for the schedulling activity

14. Collumn 28 =Number of total Katern
=M7*T7 this collumn show the total katrn that need to fold for that order. The calculation is by multiplying fix number of katern with the number of oplah.

15. Collumn 29 =Remain Katern
This collumn is the input from the scheduller if the order that allready fold in the previous day is not finish and will be continue today. The scheduller will input the number of katern that not fold yet.

16. Collumn 30 = Additional information
This collumn is also the input from the scheduller if there is a condition or additional information that need to be known for all the operator of the machine

17. Collumn 31 – 36 = Collumn of schedulling
MULAI
=IF(OR(AJ7<(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;5;FALSE));AJ7>=(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;6;FALSE)));AJ7;AJ7+(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;7;FALSE))
SELESAI
=IF(OR((AI8+AE8)<=(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;5;FALSE));AI8>=(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;6;FALSE)));IF((AI8+AE8)>=VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;4;FALSE);VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;4;FALSE);AI8+AE8);IF((AI8+AE8+(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;7;FALSE)))>=VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;4;FALSE);VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;4;FALSE);AI8+AE8+(VLOOKUP(AA8;'JAM KERJA'!$I$4:$O$13;7;FALSE))))
This collumn needed for the schedulling process by consideriing the processing time and the shift code input.