

中原大學工業與系統工程學系

113-1 學習

工業工程實習報告

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I. Company Introduction

1.1. Company Overview

Founded in 2002, Ingrasys Co., Ltd., a wholly owned subsidiary of Foxconn Hon Hai Technology Group, has established itself as a prominent player in the global technology landscape. Headquartered in Nanjing, Taoyuan, Taiwan, Ingrasys specializes in providing advanced cloud infrastructure, computing, and storage solutions. The company is known for its extensive research and development, cutting-edge operations, and comprehensive service offerings.

Ingrasys employs over 11,000 individuals worldwide, including 2,000 engineers, and focuses on high-performance server production, particularly in its Taoyuan Nanjing facility. This facility is instrumental in the company's work with major industry players like NVIDIA, Microsoft, Amazon Web Services (AWS), and NetApp, among others. Ingrasys tailors its server solutions to meet the specific needs of these global giants, ensuring reliable and scalable IT infrastructure.

The company's product portfolio spans cloud computing, artificial intelligence, telecommunications, and green energy sectors, emphasizing both innovation and sustainability. Ingrasys integrates eco-friendly practices into its manufacturing processes, contributing to a reduced environmental footprint and aligning with global sustainability goals.

Ingrasys' commitment to excellence is reflected in its state-of-the-art R&D facilities, which drive continuous innovation and uphold stringent quality standards. Through its expertise and strategic partnerships, Ingrasys is redefining possibilities in the IT industry, empowering businesses with high-performance, sustainable, and scalable solutions.

Ingrasys' vision and mission is to deliver services globally, change the way people live and work, and expand the hyper scale cloud ecosystem. Ingrasys stands as a global leader in cloud infrastructure, harnessing cutting-edge technologies such as hyper-converged infrastructure, HPC with CDI architecture, AI/ML, and advanced cooling systems to meet the complex demands of data center operations worldwide. Drawing on their extensive expertise in engineering, business, and operations, they not only offer a comprehensive portfolio of products, including servers, storage solutions, HPC accelerators, and workstations, but also provide fully integrated services tailored to our clients' needs.

Ingrasys is committed to continuously developing innovative technology solutions and services that foster long-term partnerships and support. By staying at the forefront of industry and technology trends, we drive innovation to expand the hyper-scale cloud ecosystem.

1.2 Company's Focus and Product Introduction

The Ingrasys Nanjing company focuses primarily on the production and integration of high-performance servers and related IT infrastructure components. Starting from the component, board, system, and rack. These include:

1. PCBA (Printed Circuit Board Assembly): The company manufactures and assembles circuit boards that are integral to electronic devices and servers. And in Ingrasys Nanjing factory, PCBA is used for several things:

- a) Servers and Data Centers: PCBAs are critical in assembling server components, where they help manage power distribution, signal transmission, and connectivity within the system.
- b) High-Performance Computing (HPC) Systems: PCBAs are essential for the construction of HPC systems, facilitating the integration of processors, memory, and accelerators.
- c) AI/ML Hardware: In AI/ML applications, PCBAs are used to integrate specialized processors, GPUs, and other components that enable machine learning algorithms to run efficiently.
- d) Networking Equipment: PCBAs form the backbone of networking devices like switches and routers, which are crucial for data center operations.
- e) Storage Solutions: In storage systems, PCBAs support the assembly of storage controllers, memory modules, and interfaces required for data storage and retrieval.

2. NPI (New Product Introduction): Ingrasys Nanjing is involved in the process of introducing new products, ensuring they meet quality and performance standards before full-scale production. And as a project manager, it is our job to consolidate and released product information and requirements to all departments such as PE/ME/TE/IE/EE/SCM/CM, etc. PM also responsible for the delivery plan and status follow-up of new products introduction. Also, it is really important to lead new products introduced into factory, so in this way, we can co-work with cross function team (PE/ME/TE/IE/EE/SCM/CM, etc.) to launch the product in mass.

3. L10 and L11 Integration: These refer to specific levels of assembly in the manufacturing process, where components are integrated into more complex systems or final products, such as servers. I am going to elaborate more on this part since this is also a new thing that I learnt during my time in Ingrasys. So basically, there are 11 manufacturing process levels. Level 1 to 6 or we can say L1-L6 is performed by Hyper-scales Original Design Manufacturer (ODM) which is the Quanta Computer Incorporated. Or in simple words we can say that it is a Taiwan based manufacturing giant. L6-L10 is performed by Hyper-scales original equipment manufacturer (OEM). Those Hyper-scalers did not rebrand and didn't lockdown their hardware system and

software. The last levels are L10-L11 which the one Ingrasys is working on, is the final stage of manufacturing process, where complete hardware and possibly software become an appliance. It contains everything a service provider need to activate their services.

Since Ingrasys has a lot of customers form all around the world, it is common for them to make a special project for each customers. Nanjing factory also have the Research and development team to improve their project day by day. Some of them also based on the customers' request. Overall, the Nanjing facility specializes in customizing and providing server solutions for major clients, ensuring that each server meets the specific requirements of companies like some well-known companies such as NVIDIA, Microsoft, and Amazon Web Services (AWS).

Below are some products that Ingrasys produces:

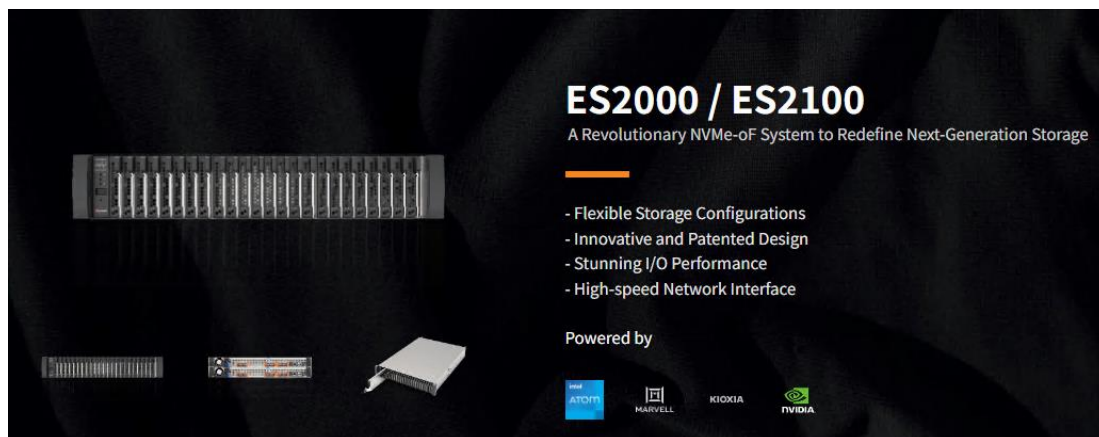


Figure 1: Ingrasys's Storage Product

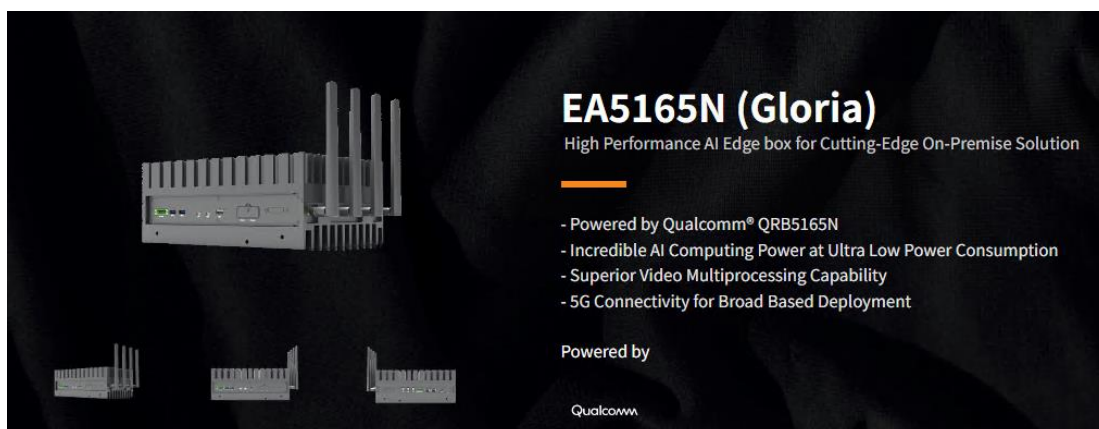


Figure 2: Ingrasys's Edge Product



GB6181

- 8 x NVIDIA HGX H100 GPUs
- 20 x PCIe Gen5 x16 Slots
- 32 x U.2 NVMe Drive Bays
- Liquid Cooling Solution
- 6 OU

[View More](#)

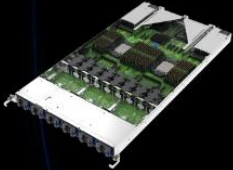


GB10181N

- 8 x NVIDIA HGX H100 GPUs
- 20 x PCIe Gen5 x16 Slots
- 32 x U.2 NVMe Drive Bays
- Air Cooling Solution
- 10 U

[View More](#)

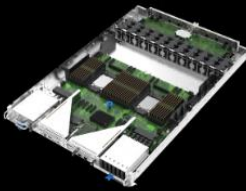
Figure 3: HPC Accelerator



SV1120I

- 2 x 4th Gen Intel® Xeon®
- 32 x DDR5 DIMMs
- PCIe 5.0 Platform
- Support E1.S/U.2 Drives
- Air Cooling Solution
- 1 RU

[View More](#)



SV1121I

- 2 x 4th Gen Intel® Xeon®
- 32 x DDR5 DIMMs
- PCIe 5.0 Platform
- Support E1.S Drives
- Air/Liquid Cooling Solution
- 1 OU

[View More](#)

Figure 4: Ingrasys's Server Product

1.3. Corporate Structure and Operations

The operational framework of Ingrasys is meticulously organized into several key departments, each playing a vital role in ensuring the seamless functioning of the company's overall operations. These departments include Project Management, which oversees the planning and execution of projects to meet the company's strategic goals; Operation Management, responsible for the efficient running of day-to-day business activities; and Quality Control, which ensures that all products and services meet the highest standards of excellence.

Additionally, the IT Department plays a crucial role in maintaining the technological infrastructure that supports the company's operations. The Supply Chain Management department is tasked with optimizing the flow of goods and services, ensuring that materials are procured and distributed efficiently. Production Management is responsible for overseeing the manufacturing processes, ensuring that production targets are met without compromising on quality. Meanwhile, Test Management ensures that all products undergo rigorous testing to meet industry standards and client expectations.

The Engineering Department focuses on innovation and the continuous improvement of products and processes, while the Research and Development (R&D) Department is at the forefront of technological advancement within the company. R&D is essential in driving innovation, developing new products, and enhancing existing technologies to maintain Ingrasys's competitive edge in the market. The department's efforts contribute significantly to the company's ability to anticipate industry trends and address emerging customer needs.

Human Resources manages employee relations, recruitment, and talent development, fostering a productive and positive work environment. The Finance Department oversees financial planning, budgeting, and cost management, ensuring the company's economic stability and growth. Finally, Cost Management works closely with finance to control expenses and optimize profitability. Together, these departments form an integrated structure that enables Ingrasys to operate efficiently and effectively. Each department's contributions are critical to the overall success of the company, ensuring that the entire organization runs like a well-oiled machine.

Ingrasys's corporate structure supports its global presence, which is widely recognized on the international stage. With a network of 15 offices strategically located across the United States, Mexico, Taiwan, China, Singapore, and Europe, Ingrasys is well-positioned to serve its global customer base. This widespread presence not only enhances the company's ability to meet the diverse needs of its clients but also reinforces its reputation as a leading player in the global market.

Ingrasys's commitment to excellence is further demonstrated by its adherence to internationally recognized standards. The company is certified with ISO 9001:2015, a testament to its rigorous

quality management system that ensures consistency in delivering products and services that meet customer and regulatory requirements. The ISO 14001 certification highlights the company's dedication to environmental management, reflecting its commitment to reducing its environmental impact and promoting sustainability in its operations.

Moreover, Ingrasys is certified with ISO 45001, an international standard for occupational health and safety. This certification underscores the company's focus on creating a safe and healthy working environment for its employees, reducing workplace risks, and enhancing overall employee well-being.

II. Weekly Internship Work Content

2.1. Before internship starts

I applied to Ingrasys 2 months before my real internship starts. Since I am a third-year student in university, I need find and do my internship because it is mandatory by my school to do it. So then when I found out that my school's website was providing some internship opportunities, I look up to it and found Ingrasys Company. At first, I feel that this is quite challenging since the department that they are opening for interns are the Production Control Management position. I don't really have interest in that department, but I take the chances to get interviewed. After one week, I also joined their seminar that was held in my school and I attended as the guest. In this seminar, I got the chance to meet the HR of Ingrasys. There I got the chance to add her LinkedIn profile, and she asked me to send my resume. She directly said to me that I would be good as a project management team. I was really excited by what she said because project management or we can call it PM is one of the positions that I was looking for. After the interaction, 2 weeks later, they contacted me for an interview.

During the interview, they asked me about what I know about project management and some qualifications of being a project management. I get a chance to talk with the head of PM and also the supervisor of PM. It was an interesting interview because it seems like I only listen to them talking about the job that I would be doing and asking me if I am ready to be a part of them. After the interview, a week later, they inform me that I am accepted, and the next step is to do an English test and a logic test. The test that was given is not hard and I manage to finish it quick. After doing all the test that was required, I am officially accepted to Ingrasys. And then I am required to do health test to be admitted working in Ingrasys.

2.2. First week of internship: Introduction to the department

On my first week of internship, I was introduced to the whole company starting from their offices, warehouses, production line, the dock, the front desk. On the first day of the week, all new employees are needed to take a specific exam for the job. Each of us need to watch a video and do a writing test. The test covers from the production line, how to hold a board correctly, psychology test, logic test, ethics test, and also technical test regarding the process of production. It was hard for me since I faced the language barrier, but with more time, I managed to finish and passed the required test. After a whole day of test, we are sent to our department. In the company, I was put into the project management department. The company provides me with desk and monitor.

On the following week, intern students are welcomed by the human resource department and they introduced to us the intern program that is going for one year. They explain to us all the hopes and the work for us to do and they are all very nice and caring. I also got to learn about my own department, since my job description is project management new product information or in Chinese 專案管理部新產品導入. I was given a bunch of videos to learn and most of them are telling about the basic understanding of project management and how to manage new products. Basically, project management has three main goals, they are under time constraint, particular aim, and also collaborative enterprise that needs to carefully be planned. The triangle of project management is quality, cost, and time. Some activities that a project manager should know is initiating project, planning them, executing it and at the same time also monitoring the project, and at the end, it was the closing. Being a project manager means you need to understand the whole process, from the beginning until the end.

During this week too, I am being introduced to the floor plants of Ingrasys. Ingrasys is quite serious in dividing their warehouses, Ingrasys has 6 floors. The first floor consists of the dock and the office for project management, product control management, customer service, and many more. The second floor it to store semi-product and finished products. There is also the packaging area there to box the things that need to be send off. Also, there is an office for the Industrial engineers and the manager of Ingrasys Company. The third and fourth floor is place where the production line is, and this place is prohibited unless you have a thing to do inside there. The fifth floor is where the warehouse and HR department are found. The sixth floor is the office of IT, engineers, and cost management.

At the end of the week, there will be a teaching session to all the member of the project management team. Every member in the department will be teaching one lesson to the others so that they can keep reminded what job they should do and how is the process. In summary, this first week is more about understanding my department and also understand some basic skill and understanding I needed to be working in the company. I learn that being a project manager needs to prepare a lot of things and they need to make sure that everything goes well.

One thing to mention too, there are weekly meetings. Weekly meetings are held every Monday in our department. Every week, every project manager will report their project condition to our supervisor and see if there is any mistake they have done or is there any other things that they can improve to make the project smoother. The interest thing about this meeting is that everyone is needed to show their progress, and they need to make sure they have fulfilled the deadlines. They will share the current status and summary, any rework status, materials, program risks, and any else necessary to add. The supervisor will make sure every project manager does the job right and keep everything in track according to the regulation of the project procedure. Supervisor will also assist if the project manager is needing any assistance. I think that this is a really good way to keep track of every project manager so that they keep reminded by the correct procedures and also call out for help if needed. This meeting is also important to make sure there is no delay in fulfilling the customer's needs. After the meeting was ending, all project managers will go back to their own job and they will meet again the next week.

2.3. Week 2 internship: The Procedure of Taking and Borrowing Parts from Warehouses

The interesting thing that is related with my second week of intern is that I got the chance to visit the warehouse on the fifth floor. Since being a project manager means you need to prepare a lot of things for RD and customers, such as things or materials needed. That is why the process of borrowing and taking material is crucial in fulfilling a project. I got the chance to do this job and there are some procedures that I need to follow. Firstly, I received a request from a PM. They will write down their requests with the necessary details needed. In Ingrasys, we use a software named SAP (System Applications and Produces). This software is a widely used enterprise resource planning (ERP) software. Then, we open the form that we need, which is the goods transfer ticket and MISC issue ticket. Then, we need to list what material is used, how much quantity you need, and also the reason of needing the material along with the code of each project that this item is being used. Every PM also need to list their project name. One thing that we need to put attention is where the material is located. Ingrasys have a special code for every warehouse. They separated the warehouses into several parts. Starting from the raw material warehouse, which separated to 2 areas, electrical parts and machine parts, semi-product warehouse (半成品倉), final product warehouse (成品倉), defected product warehouse (不良品作業組), and packaging materials warehouse (包裝區). Each of the warehouse have a special code and when we input the data to the SAP, we need to make sure that we input the correct code. If not, there will be an error with the whole process, or sometimes delay.

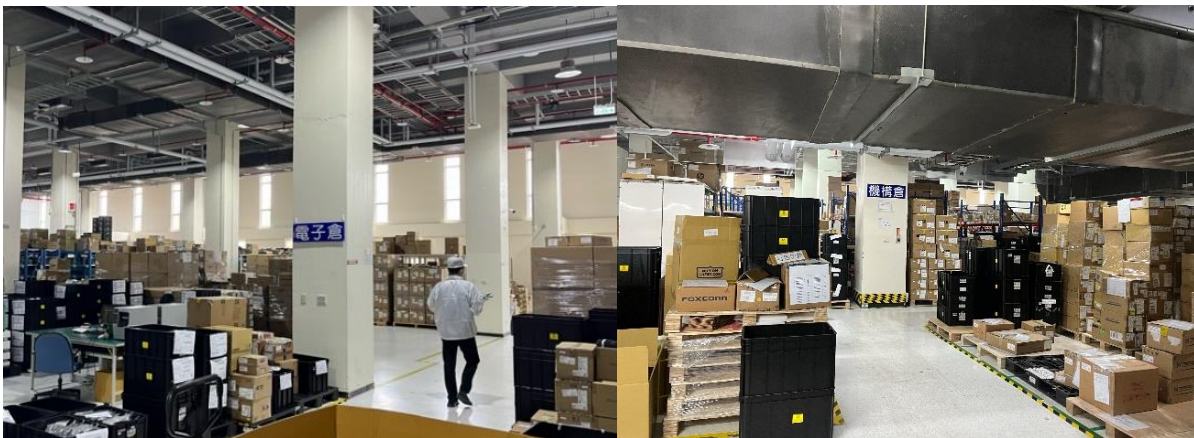


Figure 5: Electrical and Machine Warehouse

Here below is the diagram of the taking and borrowing material procedure

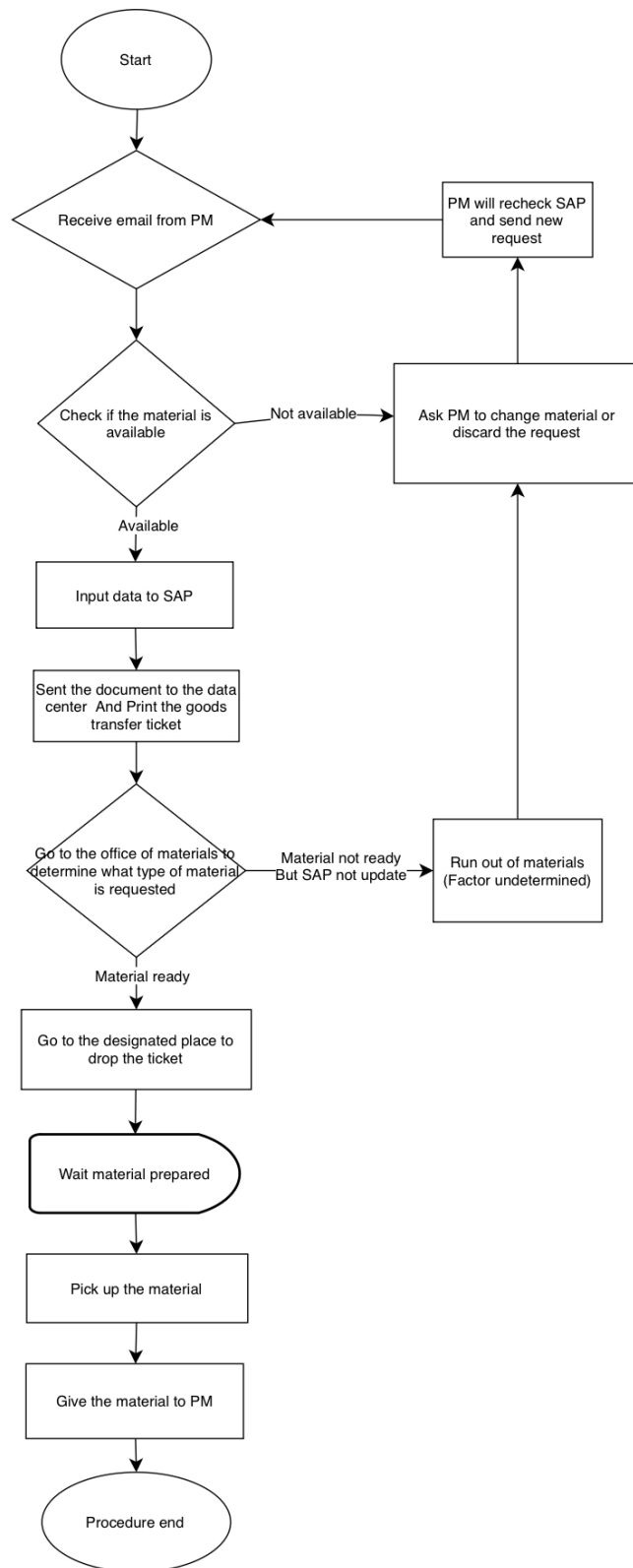


Figure 6: Procedure of Taking and Borrowing Materials

Hi Celine,

請協助開立 ██████ 專案費領，帳掛RD謝謝

專案名稱：	████████████████████
專案代碼：	0 ██████ 2
部門代碼：	7 ██████
會簽DPM：	F ██████
費領原因：	RD需求

Item	料號	版次	廠區	倉碼	數量
1	██████████ 1-G	NA	PPT8	BK0B	10

Figure 7: Request from a PM

Document number7021896476Document year2024Reason9927研究開發項目領

Document type5MISC Issue TicketRealease

Request date08/19/2024Material docRequest time09:45:03e-Issue

Employ id██████████Post Employ ID

Order██████████

CostCenter7██████████Customer

Comment██████████RD需求,掛RD費用

G/L Account No██████████

Item	Material	Batch	Material Description	Plant	SLoc	Quantity	Stock
1	██████████					10	0.070

Figure 8：轉倉單號 MISC Issue Ticket

Document number7021896474Document year2024ReasonRealease

Document type4Goods Transfer TicketRealease

Request date08/19/2024Material docRequest time09:44:58e-IssuePull list

Employ id██████████Post Employ ID

Order██████████

CostCenter██████████Customer

Comment██████████RD需求,掛RD費用

G/L Account No

Item	Material	Batch	Material Description	Plant	SLoc	Quantity	Stock
1	██████████						
2	██████████						

Figure 9: 費領單號 Goods Transfer ticket

2.4. Week 3 of internship: Checking Invoices

Entering my third week of my internship, I got a new task to do. Not only doing the procedure of purchase and borrowing things, but I also get the chance to manage some overseas invoice. Since Ingrasys has offices in United States and Singapore for instance, there are some purchases overseas that need to be reported to Ingrasys Taiwan. PM need to check whether the invoice is complete and whether the number of each invoice match to each other. My job is to check the numbers and report if there are any errors in the invoice. If there is any lack of data, error, number is not matched, I need to return back to the sender in Ingrasys overseas offices so that they can double check the invoice. Below is one example of the invoice that I need to analyze.



CCL GROUP INC.
13195 FLORES STREET, SANTA FE SPRING, CA 90670
Tel: 310-568-0123 Fax: 310-568-0505

Print Date: 8-12-2023 10:46
LILIAN@lilian@cclgroup.com

INVOICE

To : Accounting
Ingrasys Technology USA Inc - USA
[Redacted]
USA

Broker : **CCL GROUP INC.**
Shipper : [Redacted]
Consignee : [Redacted]
Carrier : [Redacted]
Agent Ref : [Redacted]
Entry No. : [Redacted]

Invoice No. : [Redacted]
HAWB No. : [Redacted]
Invoice / Due Date : [Redacted]

MAWB No. : [Redacted]
Document No. : [Redacted]
Sub Master / House : [Redacted]
Departure : TPE
Destination : Los Angeles, CA - [Redacted]
Place of Delivery : [Redacted]

NO. OF PKGS	WEIGHT	DESCRIPTION	REMARK
4	4.1 KGS		[Redacted]

ITEM	DESCRIPTION	AMOUNT
1710	Customs Entry Fee	[Redacted]
1706	Duty	[Redacted]
*** TOTAL INVOICE AMOUNT IN USD ***		[Redacted]

INGRASYS TECHNOLOGY INC
[Redacted]

Commercial Invoice

BILL TO : Ingrasys Technology USA INC.
TW
TEL : [Redacted]
FAX : [Redacted]
ATTN : [Redacted]
EXT : [Redacted]

IMPORTER : Ingrasys Technology USA, Inc. (RPO)

SHIP TO : [Redacted]
TEL : [Redacted]
FAX : [Redacted]
ATTN : [Redacted]
EXT : [Redacted]
EMAIL : [Redacted]

INVOICE NO. : [Redacted]
INVOICE DATE : [Redacted]
SHIPMENT ID : [Redacted]
SO NO : [Redacted]
FORWARDER : [Redacted]
CONTACT : [Redacted]
TEL : [Redacted]
FAX : [Redacted]

SHIPPER FORM : INGRASYS TECHNOLOGY INC

LOGISTICS CONTACT : [Redacted]
TEL : [Redacted]
FAX : [Redacted]
EMAIL : [Redacted]
SHIP BY : [Redacted]
INCOTERMS : [Redacted]
REMARKS : [Redacted]

NO.	PN	Batch	Cart's PO	UOM	Quantity	Unit Price	Currency	Amount
1	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

INGRASYS TECHNOLOGY INC
[Redacted]

Packing List

BILL TO : Ingrasys Technology USA INC.
TW
TEL : [Redacted]
FAX : [Redacted]
ATTN : [Redacted]
EXT : [Redacted]

IMPORTER : Ingrasys Technology USA, Inc. (RPO)

SHIP TO : [Redacted]
TEL : [Redacted]
FAX : [Redacted]
ATTN : [Redacted]
EXT : [Redacted]
EMAIL : [Redacted]

INVOICE NO. : [Redacted]
INVOICE DATE : [Redacted]
SHIPMENT ID : [Redacted]
SO NO : [Redacted]
FORWARDER : [Redacted]
CONTACT : [Redacted]
TEL : [Redacted]
FAX : [Redacted]

SHIPPER FORM : INGRASYS TECHNOLOGY INC

LOGISTICS CONTACT : [Redacted]
TEL : [Redacted]
FAX : [Redacted]
EMAIL : [Redacted]
SHIP BY : [Redacted]
INCOTERMS : [Redacted]
REMARKS : [Redacted]

CTN NO.	PN	Batch	Unit	CTN	QTY	N.W(kg)	G.W(kg)	Measures
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

Figure 10: Invoice

In every invoice, they need to include a commercial invoice and a packing list. If there is no any of this, we need to return it to the sender and let them revise. This checking is done by 7 other people to prevent any mistake. I think this is an interesting checking to do because in this way, we can prevent any more fatal error in the future when it is being handled by the cost management team. If there is no mistake in our inspection time, we send the invoices to the next checkpoint.

2.5. Week 4 of internship: Surface Mount Technology (SMT) Process

During my fourth week of internship, I learn about the process of PCBA or stands for Printed circuit board assembly. PCBA is the process of soldering electronic components to a printed circuit board or known as PCB to create a functional circuit. PCB is actually really important for electronic devices and servers because it provides a solid foundation for components and facilitating connections between them. With this process, engineers can assemble some PCB to make the desired electronic device.

Everyone in the company should practice the safety regulation in order to enter the SMT process field. Since it is high risk of electrostatic, we need to use an ESD (Electro Static Discharge) suit. All of this equipment is mandatory to be followed by every employee in entering the electrostatic area.

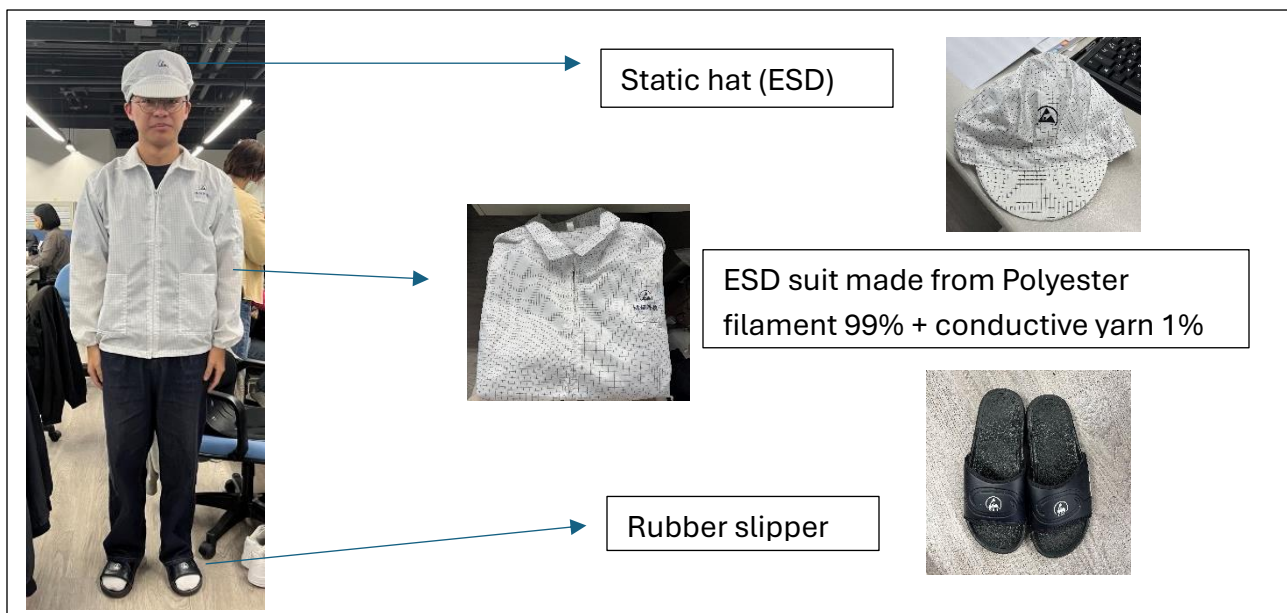


Figure 11: Safety Equipment

Since Ingrasys keep everything confidential, I am not allowed to take picture of the machines in the SMT process, therefore I am using a visual diagram to present the SMT process. The process showed below may not be completely the same with what I describe above, but the visual representation is close enough. Along with the picture, I will explain furthermore about the SMT process in detail.

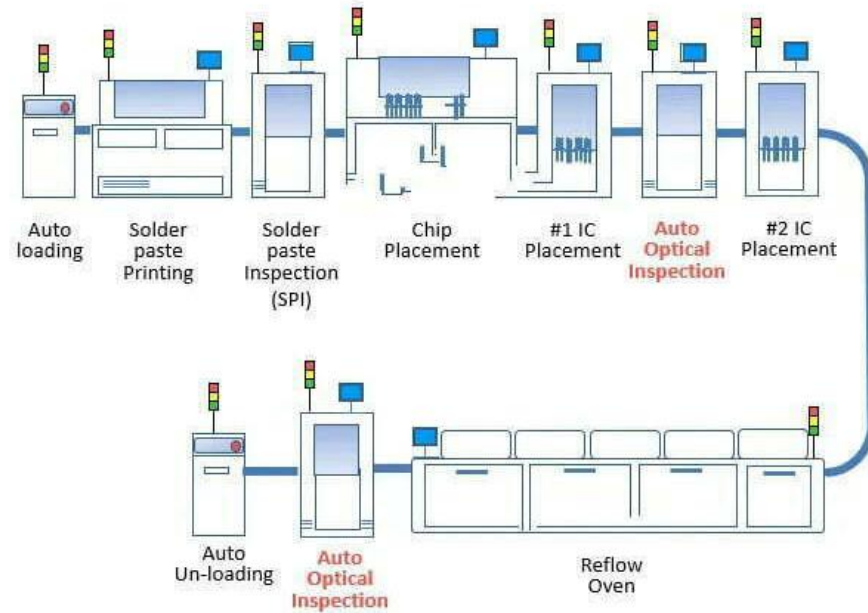


Figure 12: SMT Process

The first step is to input the plain board into a machine named NS31. Then the board will go to an automatic labelling machine to print the serial number. The machine can label up to 4 labels at one time. These labels are so important so they can keep track of the inventory. After the labelling, it will go to the inverter machine where it means the board will be flipped and ready to be soldered with components. The machine will heat up the solder paste in order the components can be stacked on it. After the solder paste, we need to do the inspection to check whether the components are correctly placed or not using the SPI (Solder Paste Inspection) machine. After no issue, the next process is mounting. Mounting is the process where they stick the components to the heated solder. Then once again, after every placement process, they need to do a visual inspection.

After the components are placed correctly, there is another process called reflow. Reflow is the process where you heat up the board with components up to 200 degree Celsius. The purpose of reflow in this process is to permanently solder the components to the boards. After the reflow process, the board will go to an AOI (Automated Optical Inspection). This AOI machine is actually a big help to manufacturers because it can help them to detect any defects on early stage. Some defects mentioned such as polarity, body dimension, pad offset or shift, missing lead, solder fillet, marking, and many more. This kind of inspection machine are important especially for manufacturing process because every inspection, test, and measurements can help the cost reduction. The earlier you identify the defects, the less money you will spent on the final product. For further information, AOI is also one of the busy inspection tools in the SMT process. It is the most cost-effective and reliable inspection tool. It is using HD cameras and compares them with the existing template image to detect any abnormalities.

Half of the SMT process is done. Next, the board will go to the inverter where they will flip the board. This happens because some boards need to have components on both sides. Then the same processes are repeated which is putting the solder paste, and then do the inspection by the SPI machine, continued with mounting, another visual inspection. Followed by reflow process, the AOI machine, and the router. Then every board needs to be trimmed to make it more proper and make space for larger components. Next process is called DIP. This process is where we put larger components that is not possible being done by machine because it is too big and needs to be done by hand. After DIP, they need to touch up where in definition is they need to glue all the larger components to the board to make sure that the components stay intact on the board. Lastly, the X-Ray inspection. X-Ray inspection is mandatory because this helps us to check the parts where can't be seen by human eyes on the outside. It helps us to check any defect in the inside. After the SMT process is complete, we need to do testing to make sure the board is working.

The fifth week of my internship, I learn about the customers that are coming to Ingrasys to have meeting with the project managers and also the research development team. The purpose of the meeting is to discuss about the current project and to visit the factory to check on the progress. The customers usually come from all around the world and come to visit Taiwan to make some development here.

Application form for carrying mobile phone and recording device										提報日期: 1998 年 12 月 4 日 Date of filing out the form	
編號 No	單位 unit	職別 job titl	工號 Work Number	姓名 Name	手機 (品牌/型號/IMEI 15位) cell phone (Brand model number) (IMEI code 15)	開放手機功能 Open mobile phone functions	手機攜帶申請區域 Cell phone portability application area	申請原因說明 Reason for application	流水號 serial number	僱用人 簽名確認 Applicant Signature Confirmation	EHS 簽名確認 EHS Signature confirmation
1	COXD	工程師	8000X2	陳XX	012345 01234567891011	1.開放手機通訊功能 ■ 1. Open mobile phone call function 2.開放拍照錄影功能 ■ 2. Open photo and video function 3.開放端口傳輸功能 ■ 3. Open port transmission function	■2F ■3F ■4F ■5F	COX專案生產需要 現場協助			
2	PM	PM	ZXX234	林XX	012345 012365754791011	1.開放手機通訊功能 □ 1. Open mobile phone call function 2.開放拍照錄影功能 □ 2. Open photo and video function 3.開放端口傳輸功能 □ 3. Open port transmission function	■2F ■3F ■4F ■5F	XXX專案			

提報人聲明: 1. 員工需要將攜帶具有通訊功能裝置進入生產區域，請經申請人簽名確認，經廠區最高主管簽名後始得進入。

2. If you need to bring a device with a video-recording function into the production area due to work requirements, please fill in the application form, which must be signed by the applicant and approved by the top supervisor of the factory.

3. The validity period of the permission to carry a mobile phone: three months, and a new application must be made before March, June, September, and December 31 of each year.

4. 申請人應簽署保密協議，才准將通訊功能裝置，並遵守公司規定之保密協議系統，如無履行不遵從規定，造成公司生產管理外洩，將依「員工懲戒管理辦法」及「智慧財產」進行查究，公司得追究法律責任。

5. Applicants are required to sign a confidentiality agreement before an identification tag will be issued, and they must abide by company regulations and user identification tags. If colleagues use the device improperly and cause the company's production secrets to be leaked, they will be punished in accordance with the "Employee Reward and Punishment Management Measures" and "Confidentiality Agreement" will be punished, and the company may pursue its legal responsibilities.

6. 申請理由：申請人填寫簽名確認→申請主管審核→安全經理審核→廠區主管核准→廠區人員簽名後始得進入生產區域。

6. Application procedure: The applicant fills in the signature for confirmation → Review by the class supervisor → Review by the department supervisor → Sign off by the safety manager → Approval by the factory supervisor → Return to the Human Resources and General Affairs Department for future reference → The Human Resources and General Affairs Department issues an identification name tag.

7. IMEI碼查詢方式：手機輸入*#06#即可查閱手機IMEI 15碼

8. How to check the IMEI code: 15. Enter *#06# on your phone to check the IMEI code of your phone

廠區核准 Approval Field				
廠區主管核准 Factory Supervisor Approval	安全經理 security manager	部門主管 Department Head	課組主管 Class supervisor	填單人 Person who fills in the form

The form consist of the number of the cellphone, names, which floor that is allowed to visit, the function of phones that can be used, the name of the project that is need to be done using this phone, and also we need a sign form 5 different people to approve this. This seems quite simple but those who sign really need to check each applicants. There will be some days where some managers will ask is it necessary to bring phone to this specific floor and they will ask all the details. Sometimes, it will not be approved because the supervisor felt that something is off about the applicants, and I need to return and ask to the PM who apply this at the first place. If everything is approved, we send the document to HR and they will process the sticker for the phone.

I am really impressed with the safety regulations made in this company. I learned about security and confidentiality. It may seem too strict for me at the beginning, but then I realize how important for every company to keep secret of their private information and how we as an employee also need to be careful in approving everything. Being strict and careful is needed at all times. Lastly, in entering warehouse or production line, there will be a security check points. These are there to make sure there is no illegal device entering or any goods stolen.



Figure 14: Inspection checkpoints.

2.7 Week 6 of internship: Product Quality Checking

During my sixth week of internship, I work under one PM and she asked me to do a quality control checking before shipping out the goods. One problem that we often encounter with customers is that there will be times where customer will demand for more specific things. And as a PM, we need to fulfill their request. We know that every customer demands a perfect condition of item sent out to them. One problem I encounter while working in this project is that some products come out from the production line has some temporary defects. There are some spot of mold or bubble marks that can be seen by our eyes. Customer demands that we need to make sure that there is no spot at all at the products. So that is why, we and my supervisor is wiping the boards to make sure that it is spotless.

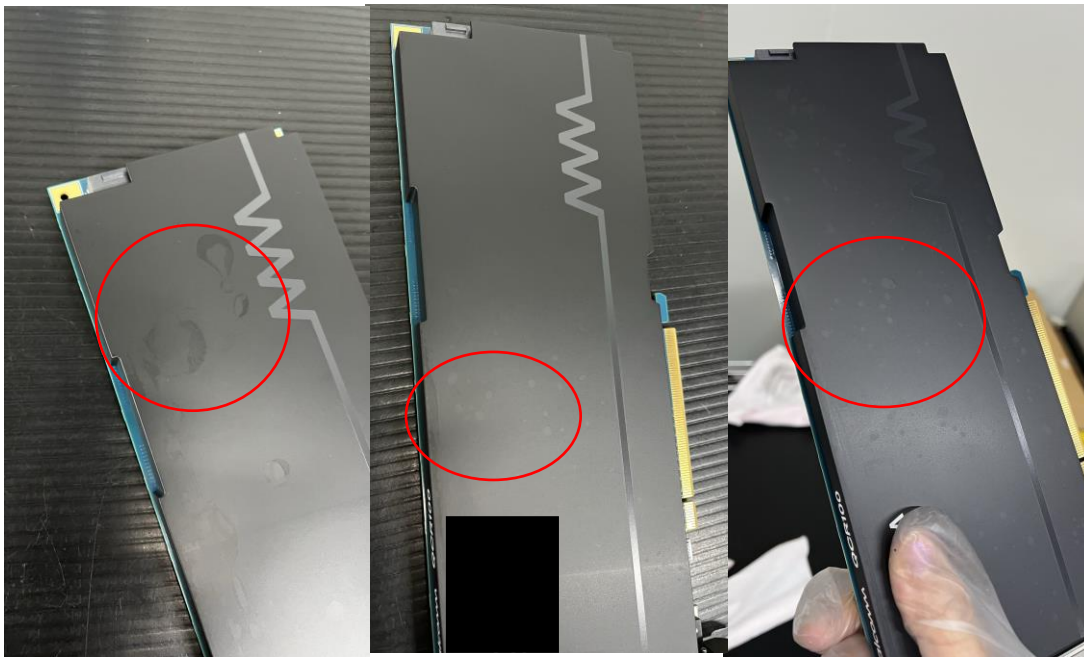


Figure 15: Defective Products

However, in cleaning all the parts, there are some space of improvements that they can make. I will elaborate more in the next chapter regarding this. One thing that can be mentioned is that it requires a lot of time and effort to make this board completely spotless and we need to rush the work with the targeted time to be delivered. Though it requires a lot of people to work and even working overtime, the team manage to fulfill the goal asked by the customer and got delivered in time. At the end of week 7, I spend most of my time making sure of the quality of the products and making sure that it fulfilled the customer's wishes.

2.8. Week 7: Return of Goods.

In the seventh week of my internship, I got another new task to learn that is returning goods when it was taken by mistake or project are already being solved so the materials/goods is no more needed. As what I mentioned in week 2, there is a procedure of taking goods/materials, but there is also the return procedure. A return is happen when we already take the material/goods, but the PM or RD is no longer needs it because the issue is solved or the customer doesn't want it anymore. Another case is when PM or RD gave me the wrong material number or quantity so i need to return back to the warehouse. At least these two case is what I faced until now. In order to make a return there are 2 ways. If the issue (taking and returning goods) is happening between one month, we can just return it by giving it directly to the warehouse and opening a document as shown below.

Document number 7021905264 Document year 2024 Reason
Document type 4 Goods Transfer Ticket Realease
Request date 08/27/2024 Material doc
Employ id Request time 09:30:49 e-Issue
Order Pull list
CostCenter Post Employ ID
Comment Customer
G/L Account No

Item	Material	Batch	Material Description	Plant	SLoc	Quantity	Stock
1	M1281347-904-W		(Spare) DC-SCM V1.2	PPT8	BK1B	2	306.000
2							0.000

Document number 7021905265 Document year 2024 Reason 0027 研究開発
Document type 5 MISC Issue Ticket Realease
Request date 08/27/2024 Material doc
Employ id A1-03722 Request time 09:31:00 e-Issue
Order 1
CostCenter 7 Post Employ ID
Comment FOR SWITCH BOARD BFT Customer
G/L Account No

Item	Material	Batch	Material Description	Plant	SLoc	Quantity	Stock
1	M1281347-904-W		(Spare) DC-SCM V1.2	PPT8	2K4B	2	10.000
2							0.000

Warm regards,

Figure 16: The Original Request from PM

The red circled part is the original location warehouse of the goods, the green circled one is the location where we need to take from (which all material of goods will go there).

Hi Celine,

抱歉, RD端問題已修復,
這2pcs 要麻煩退回倉庫哩, 感謝!!!

Best regard,

Figure 17: Change of Request from PM

In this picture, the PM is requesting me to return the things since the problem is already fixed by RD so that the material is no longer needed. This way, since it just happened and less in one month, I can just return the goods in the warehouse and opening another new document such as below. The difference with the original document is just the storage location code. The code will be reversed since the material will go back to the original place.

Josh 您好,

轉倉單號: [7021906520](#)

Document number	7021906520	Document year	2024	Reason	
Document type	4	Goods Transfer Ticket		Release	
Request date	08/28/2024	Material doc		☐ e-Issue	
Employ id		Request time	08:23:10	Pull list	
Order					
CostCenter		Employ ID			
Comment	專案, RD端問題已修復, 轉倉回BK1B				Customer
G/L Account No					

Item	Material	Batch	Material Description	Plant	Stoc	Quantity	Stock
1					2K4B	0	13.000
2							0.000

Warm regards,

Celine Zheng鄭愛馨

Figure 18: Change of Warehouse location

The material will return to the original place and the procedure is completed.

2.9.Week 8 of internship: POD tracker

In the last week of my internship, I was assigned for a new task which is tracking the shipment of goods. Every PM with a project need to report where is their goods as along with all the purchase needed for the shipment. However, not every shipment can goes smoothly. Sometimes, they are stuck in the courier, the driver, payment delays, and many more. So that is why, every Friday of every week, we need to make a tracker for every PM to make sure that they have every shipment under control. Every shipment has their own invoice number and along with that, every PM should input every receipt that is related to the shipment.



關務資料查詢

關務資料維護

DN搜尋

Shipment ID
[redacted]

Invoice No.
[redacted]

Incoterm

Ship Model by
Air

Broker Data

最後更新時間: 2024-08-28 15:36

Customs Declaration No :
[redacted]

Customs Declaration Date : 2024/08/28

Declaration Release Date : 2024/08/28

Declaration file :
[redacted]

Upload file :
[redacted]

Figure 19: POD Tracker Data

All shipments should fulfill all the data above, if there is one missing, it means the shipment is not yet complete and every PM should keep tracking them until it arrived at the customer.

Table 1: POD tracker data

POD tracker for 2024/8/26-8/30						
shipped Date	Project	DN	POD received (V)	Ship to	Remark/MPM check POD at sy	PM name
8/26/2024	OXXU	70XXXXXXX	not yet	TPE		kim
8/27/2024	C4XX	71XXXXXXX	V	SG	uploaded	kim
8/27/2024	C4XX	72XXXXXXX	V	SG	uploaded 非保	dede
8/27/2024	HXX	73XXXXXXX	V	TPE	uploaded	nana
8/27/2024	GXX	74XXXXXXX	V	Hsinchu	uploaded	veli
8/27/2024	MXX	75XXXXXXX	V	TPE		kenny
8/28/2024	AXXX	76XXXXXXX	not yet	TPE	ETA:9/2	beatrice
8/28/2024	XX	77XXXXXXX	V	IDN	uploaded	kenny
8/28/2024	MZZ	78XXXXXXX	not yet	GR		kenny
8/29/2024	CXX	79XXXXXXX	V	NQ	uploaded	kenny
8/29/2024	DXX	80XXXXXXX	V	EU	uploaded	sam
8/29/2024	KXX	81XXXXXXX	V	EU		max
8/29/2024	GXX	82XXXXXXX	Not yet	TPE	uploaded on 9/2	tesa
8/30/2024	CXX	83XXXXXXX	V	KH	uploaded	tesa
8/30/2024	CCXX	84XXXXXXX	V	Taoyuan	uploaded	bryan
8/30/2024	CXX	85XXXXXXX	Not yet	TPE	ETD:9/2	steven

What I was assigned for is that I need to chase each PM to fill in the table above. I need to update this every week and report it to the supervisor. I need to ask clearly if the shipment is complete or not. If not, I need to ask when the shipment is possible to be finished. They also need to provide the ETA and ETD which respectively stands for estimated time arrival and estimated time departure. Since I need to do this on Friday, most of the shipment next will be done on Monday. PM who is not writing down their shipment summary in the table will have to report themselves to their supervisor and explain regarding why the shipment is delayed. After all the procedure is complete, I need to print this out and let every PM to sign it.

The following week, which is the next Monday, I still need to catch up those PM who haven't got their shipment complete. I need to make sure that every PM has their shipment completely done. My job is finished when all the shipment is complete. It doesn't stop there because there will be always another week of shipment and this need to be done continuously. This concludes my 8 weeks of internship.

III. Implementation of Improvement Projects and Results

3.1 Problem and improvement for cleaning boards

During my 8 weeks of internship, I found there are two things that I can improve to make everything more efficient. The two things are the layout of the semi-products and the procedure of cleaning boards. I have asked permission to those related in helping them fixing this and they agree to my help. I will be elaborating the problem in the next bullet.

3.1.1. Problem explained for board cleaning.

While I was working for cleaning the board for the first time, I found small discomfort and ineffectiveness. First, since it was performed standing up, it makes our legs numb. Second, since it requires us to stand up, because sitting down makes us have less power to wipe, our back tends to bend forward which cause back pains. Third one, the location where I first wipe is insufficient of bright light that led the boards could not be completely cleaned and instead we have to repeat the cleaning process. This means rework and this is completely not efficient and wasting time. Especially when we are on a deadline, rework is something that we need to avoid. We need to do things swift and perfect for the first time. Fourth problem is the table cloth that we are using is causing us to have more effort to clean. I receive a cloth for the first time wiping it and the material is quite rough. The more I clean the board, I discover that this cloth is not really suitable for wiping. It only caused the board to leave imprint marks of the cloth's thread. It make us harder to wipe. Also, since this cloth has bigger thread gap, we need to use more alcohol to make it stay wet to clean the boards. This makes us waste bottles of industrial alcohols and table clothes. When I found out about this, I suggest things to my supervisor and the next day, she let me go to a better place with better lighting, seat, table cloth, and table.

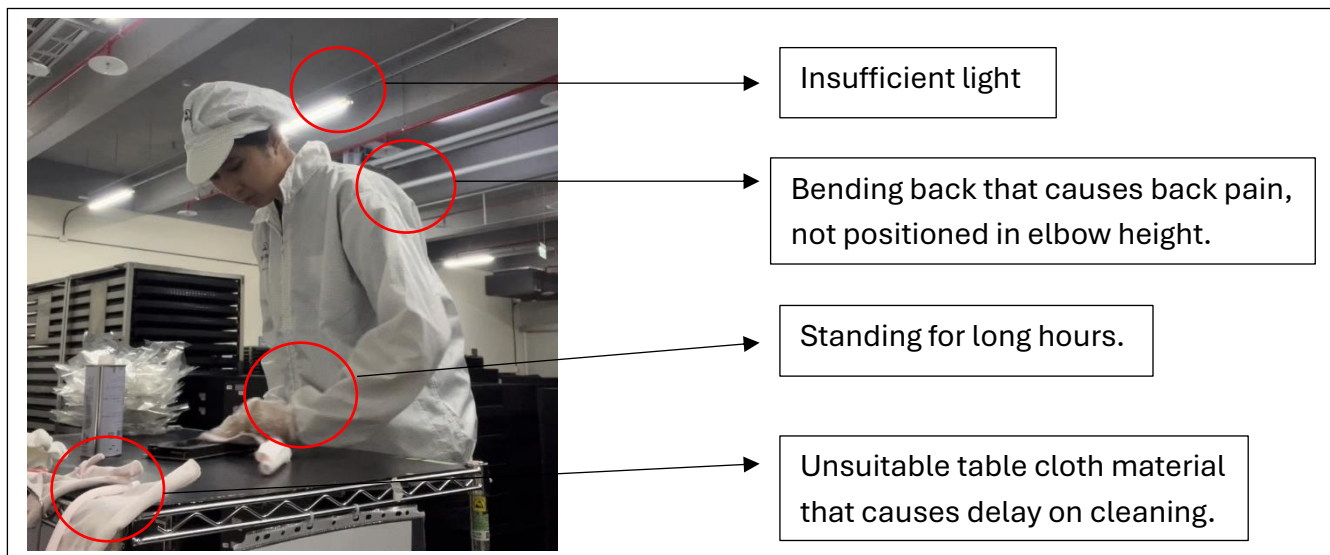


Figure 20: Before improvement

3.1.2. Using the principles of Human ergonomics to solve

To address the discomfort and inefficiencies you're facing using principles of ergonomics, some solutions that I applied are:

1. **Standing and Leg Discomfort:** Standing for a long hour of work can lead to leg numbness and fatigue. Ergonomically, consider using an anti-fatigue mat where you stand. This helps distribute pressure on feet and reduces strain. Alternating between sitting and standing could also help. So, I then moved to a place where seat is provided. This makes my job easier and less numb.
2. **Back Pain Due to Posture:** Since bending forward causes back strain, adjusting the height of the board or workstation so you can maintain a neutral posture is important. The board should be positioned at waist or elbow height to avoid excessive bending. Using an adjustable, supportive chair while sitting could allow me to rest when needed without compromising your cleaning effectiveness. I search a chair with an adjustable height and things are easier because I was not bending so much.
3. **Improving Lighting:** The lack of proper lighting affects your efficiency. Bright places with proper lightning make us do our job even better and see even clearly. This way, I can clean all the spots cleanly and only need one time to clean. After I moved into a brighter place, less time spent to clean and I got better result.
4. **Inappropriate Cleaning Cloth:** A rough or unsuitable cleaning material creates inefficiency and extra effort. I changed the table cloth into microfiber cloths instead. They are soft, effective for picking up dirt, and leave fewer streaks or marks on surfaces. Also, using an appropriate amount of cleaning solution and better-quality materials will reduce waste and improve efficiency. This may sound like a small issue, but actually it is a great impact to my work. I finish my work faster and got an immaculate result.



Figure 21: After improvement

3.2 Problem and Improvement for warehouse layout

While doing all the taking goods and returning it, I was most attracted with the layout of the semi-product warehouse. Ingrasys recently is under a renovation in some parts that caused the semi-product warehouse to move into another area.

3.2.1 Problem explained for warehouse layout

The problem is that the layout is still a mess and caused disruption in the way. Workers bumps to each other, hard to locate where the materials are, and also less pathway for cart and vehicles.

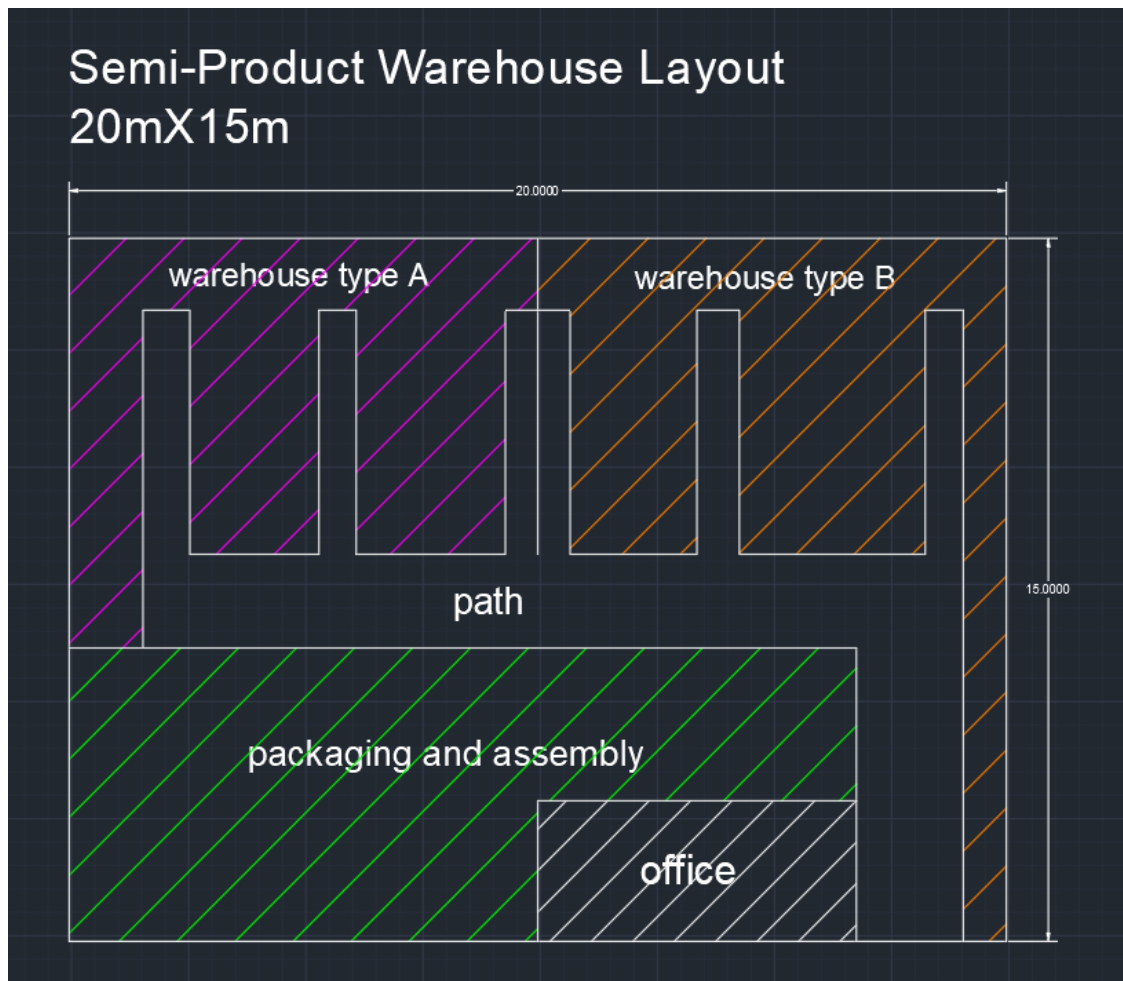


Figure 22: Original layout

3.2.2 Using the principles of facility planning to solve

With what I learnt in the Facility Planning class, we can use Muther's systematic layout planning procedure to solve this problem. We need to identify key areas: Office, Warehouse Type A, Warehouse Type B, Packaging and Assembly, and the Path. Then we need to determine relationships based on the flow of materials, worker movements, and functional interdependencies. Categorize the relationships is also important such as:

Table 2: Closeness rating

Value	Closeness	Area
A	Absolutely Necessary	Office and packaging assembly
E	Especially Important	Path for cart movement to warehouses
I	Important	warehouses and office, path with office
O	Ordinary closeness okay	Packaging and warehouse type A and B
U	Unimportant	Warehouse type A and B
X	Unimportant	N/A

The table made above is based after discussing with the workers in the semi-product warehouse. After deciding what is important to once each other, we can make the space relationship diagram. Office and packaging area should stick together because this way the supervisors will be more easy to check on the availability of materials without going to much walking. Path is absolutely needed for warehouses because there is where worker get the products. Warehouse and office can be put as “Important” since making them close to each other will make pathway easier. Warehouse type A and type B is not really necessary to be together. We don’t have many elements, so it is normal to have areas attached to each other. The relationship will be discussed as below.

Table 3: Activity Relationship Chart

	A	B	C	D	E
A	-	A	I	I	I
B		-	O	O	O
C			-	U	E
D				-	E
E					-

According to the activity relationship chart, we can then establish the space relationship diagram. This may be differ than the one we learn in class because the one we learn in class is more about workstations to workstations connected with the production every workstation produce. However in our case, there is no need to be specific in numbers because what we are aiming is the effectiveness of pathway and minimizing pathway from one area to another.

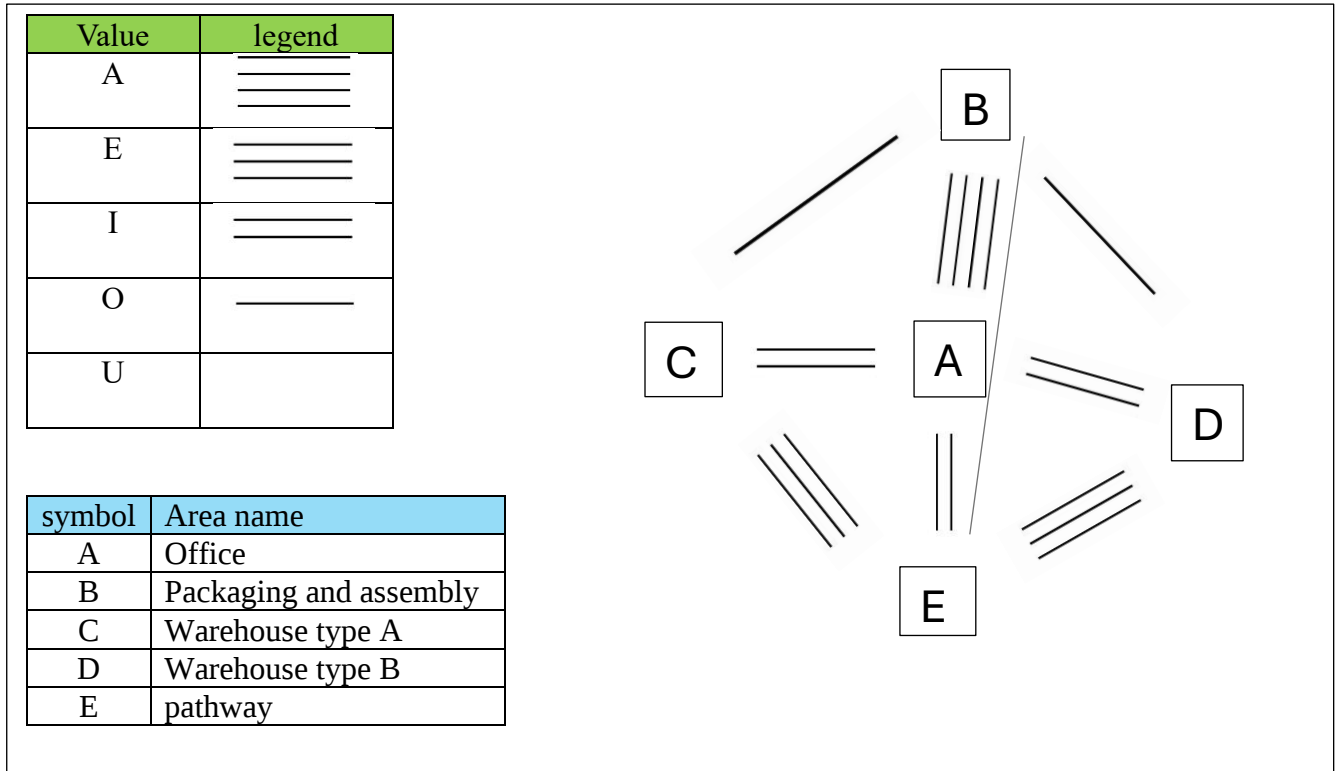


Figure 23: Space relationship diagram

According to the space relationship diagram, we can establish the block layout. It doesn't have to be perfectly in size at first but it gave us the visual of the layout. One thing to mention is that pathways in here are circumstantial since pathways can be located in every area.

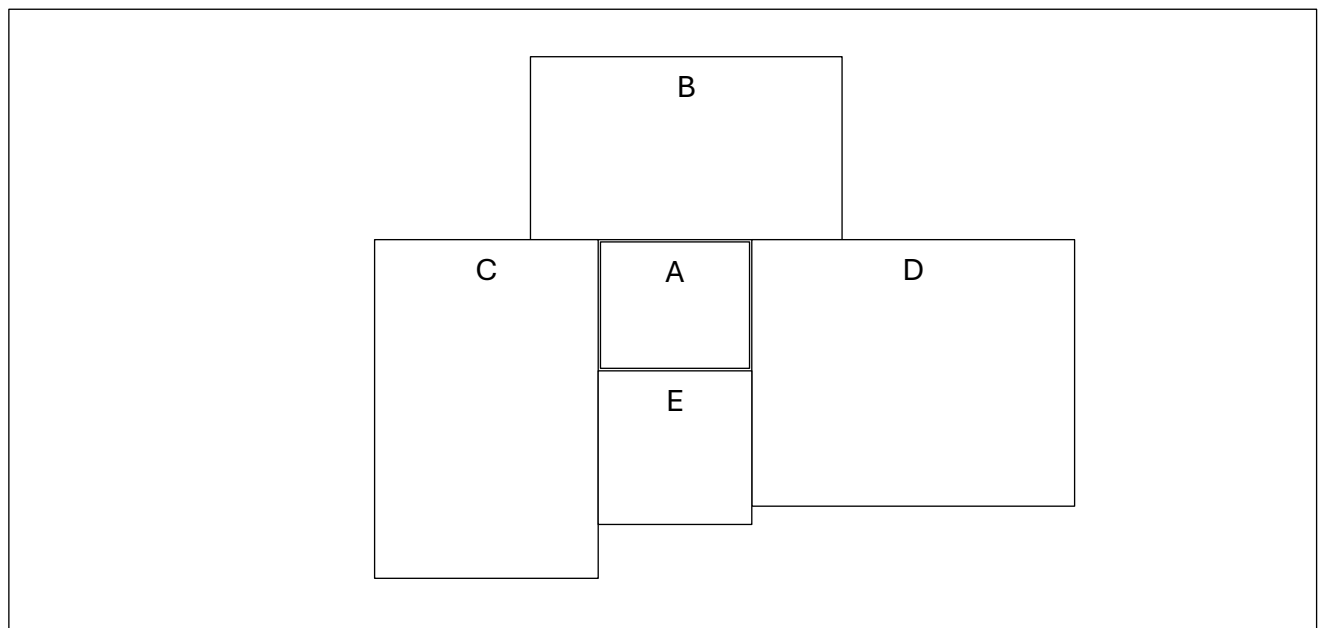


Figure 24: Block layout

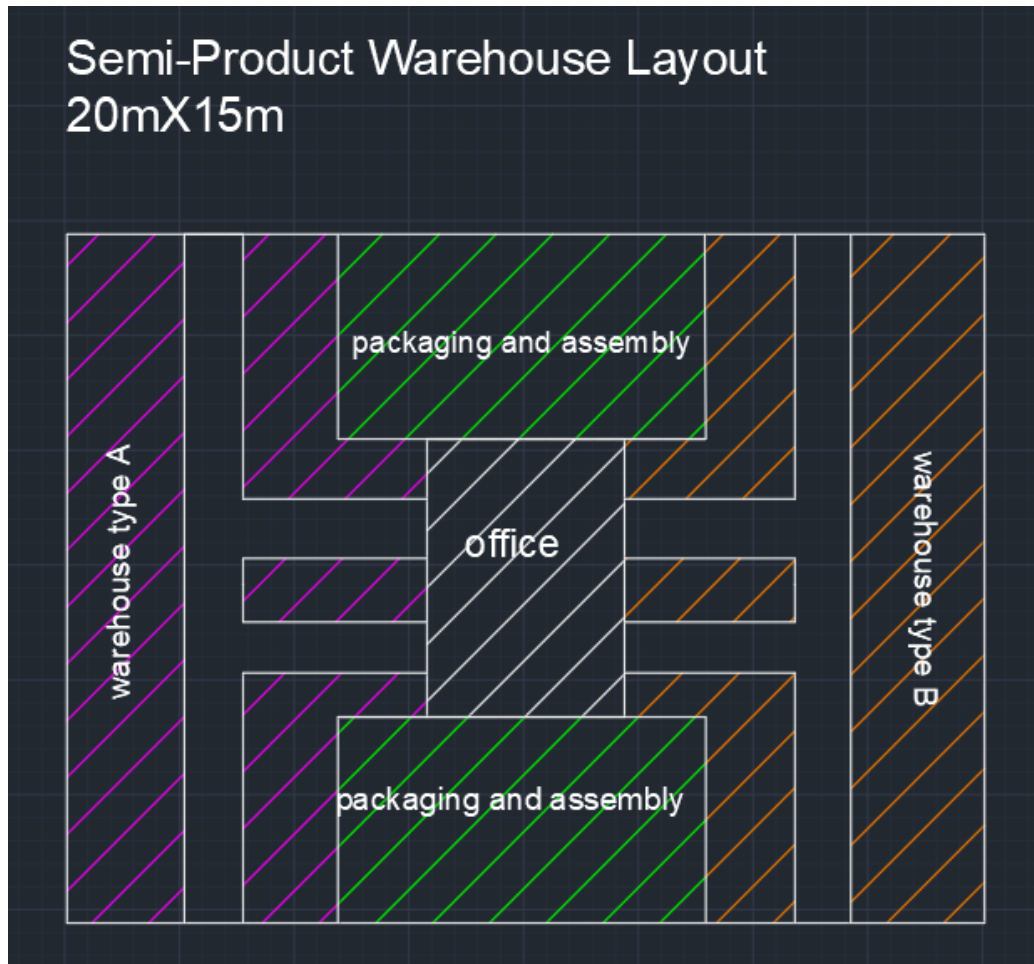


Figure 25: After Improvement layout

Positive Aspects after the improvement by Muther's Systematic Planning:

1. Centralized Office: Placing the office in the center is a great improvement. This provides easier access to all areas, improving communication and oversight without interfering with the workflow.
2. Symmetrical Design: The symmetry between Warehouse Type A and B, with a central path leading to packaging/assembly, ensures smoother movement for both materials and workers. This layout minimizes excessive walking distance and improves efficiency.
3. Proximity of Packaging and Assembly Areas: The packaging and assembly areas are now placed closer to the warehouses, which is ideal for reducing transport time and improving flow between storage and assembly/packaging tasks.
4. Clear Pathways: The layout provides dedicated paths, preventing congestion in high-traffic areas. Workers and carts have more space to move freely between zones, minimizing delays and accident..

IV. Internship Insights and Reflections

4.1 Professional Growth



Figure 26: Picture with My Supervisors

During this internship, I am being introduced to the technology industry which I never been before. Especially, interning in the project management team makes me learn that we need to take care a lot of things from raw materials to customer. Being a project manager means you need to take care a lot of things even the smallest things that you think it will not matter. Every movement have its own procedure and we need to do it based on the correct way. Missing one of the steps will cause a disturbance for other departments. Being a project manager also means that you need to keep up with the demand and the deadline that was asked for. Being professional is really needed in this kind of department.

Understanding how the machines works, procedures, customer's demand is always be our priority. We need to master the whole thing so that we can ensure everything runs smoothly. I am also aware that every customer has their own demands and I see how every PM and supervisors in my department are able to solve those issue.

4.2 Personal Growth

In this period of internship, I learn many new skills. I learn to be swift and quick because the clock keeps ticking. Any delay that I do will impact the other team. I also learn how to be a good team player. Being a project management intern means you need to interact with a lot of people starting from warehouse worker, production line worker, your supervisor, people in the office, and also customer. Being able to communicate with them is another skill that is required. Communication is very important.

In this period of time to, I am really glad that I got introduced to the tech industries and actually learn a lot from them. I get to meet some customers too and able to discuss things with them. I get to help my colleague in finishing their task. I get to join meetings and learn the distress in working in PM and it is actually a fun thing to experience.

4.3 Reflections

I am an international student in Taiwan and this is my first time of having an internship outside of my country. I think it is a great opportunity for me to experience working abroad especially in the technology industry. I am grateful that I met a wonderful team who is willing to teach me patiently. I see how people treat each other here and I believe that a good team will lead to a good ending. I learn that we need to be humble in order to learn new things and cooperating with other people is something that we will be encounter everyday. I may have encounter some language barriers and when first entering, new vocabularies that I never heard before, and also some working culture that I may not be familiar, but with the working environment that is supporting, I can enrich myself and learn to be better day by day.