



اَوْنُوْرُ سِيْنِي تِي كُوْلُو كِي فَا بَا
UNIVERSITI
TEKNOLOGI
MARA

ROYAL SELANGOR*

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ABSTRACT

This industrial training report describes Nurainul Kamalia binti Iskandar Hussein's training which consists of 24 weeks before completing the Diploma courses. The course was conducted at Royal Selangor International between February 22nd and August 4th, 2022, under the supervision of Nik Camelia binti Nik Omar Al-Haded, the Supply Chain Executive of Royal Selangor. This program aims to fulfill the requirements for completing the diploma and graduating from the university. Prior to graduation, the training refers to relevant work experience that will enhance professional development. In first chapter of this report, it defines the term of industrial training and description on industrial training objectives as well as some general industrial company information. The second chapter is the overview of the company and department meanwhile for the third chapter, it describes the summary of the projects and weekly activities throughout 24 weeks in industrial training. In chapter four, it explains in detail about the projects, the problems encountered during the training and approaches adopted to solve the problems. It also discussed about the professional and ethical issues in the company as well as in term of health, environment and sustainable aspect. After all, it is concluded that after going through the industrial training, student is able to demonstrate acceptable social skills and responsibilities as well as being able to follow professional ethics in completing tasks. Student also have the ability to demonstrate a commitment to lifelong learning and independent learning as well as developing good verbal and written communication skills throughout the industrial training course.

CHAPTER 1

INTRODUCTION

1.1 Overview

Industrial Training (IT) is a mandatory requirement for students in certain programs at all levels of the Institution of Higher Learning (IHL). To enhance the level of graduates' ability to work, an industrial training program was implemented to strengthen their competencies. The Industrial Training (IT) program offers students a chance to experience engineering work in real-life situations and to be involved in projects related to Chemical Engineering before they graduate. A student is required to complete at least twenty-four (24) weeks with twelve (12) credit hours of Industrial Training within semester six (6) or after passing all coursework from semester 1 to semester 5 in order to receive a Diploma in Chemical Engineering.

UiTM's Industrial Training program aims to introduce students to industrial culture and working environment and enhances their employability rate by strengthening their industrial skills. They also will undergo several briefings as guidance for the trainee. The duration for this internship is twenty-four (24) weeks and takes place from February 22nd, 2022 until August 4th, 2022. As stated in the Industrial Training briefing, students are required to report to the company according to the specified time and date. Throughout the internship period, students will undergo one Lecturer Evaluation to assess their performance. Two weeks after internship ends, the logbook and final report must be submitted online to the college, and hardcopies must be provided to the college after the internship ends.

Through Industrial Training courses, students can gain practical experience in the world of work, thereby improving the market's reliability. During industrial training, students gain excellent technical skill competence and soft skill competency that will prepare them for careers as chemical engineering technicians. It is expected that students will be able to learn the theories they have learned in all core and non-core courses in industrial training, and thus will be able to solve problems and projects assigned by supervisors in a creative and innovative manner. Students also benefit from industrial training by gaining more confidence, improving their communication skills, and working together more effectively. Additionally, students are expected to demonstrate integrity, ethics, and accountability throughout their practice of engineering.

1.2 Objective of Industrial Training

A major objective of Industrial Training (IT) is to expose students to real-world situations in order to gain practical experience that will enhance market reliability. As the students prepare for careers in chemical engineering, industrial training provides them with excellent technical skills and soft skills. The other objectives are:

- Achieving technical proficiency
- Achieving a solid understanding of the background
- Enhancing interpersonal skills (soft skills)
- Establishing a network of contacts

1.3 Industrial Training Placement

1.3.1 Industrial Schedule

Normal working hours	8 hours
Day of working	5 days a week
Work in	8.00 am
Break hour	12.00 pm to 1.00 pm
Work out	5.00 pm

Table 1.1: Industrial Schedule

1.3.2 Company Supervisor Information

CHAPTER 2

COMPANY PROFILE

2.1 Company Background

Established in 1885, Royal Selangor International Sdn Bhd, doing business as Royal Selangor is a Malaysian company that manufactures and sells pewter. Royal Selangor is the largest pewter company in the world with more than 40 stores worldwide including London, Toronto, Melbourne, Tokyo, Shanghai, Hong Kong, Sydney and Singapore. Royal Selangor can be found in shops such as Wako and Mitsukoshi in Japan, Harrods and John Lewis in the United Kingdom and David Jones and Myer in Australia. It is represented in five continents with eight offices worldwide, and it has a website as well. More than a thousand gift items and tableware items are available from this company, including tankards, tea sets, photo frames, desk accessories, and wine accessories.

New Product Development Department

Days	Working Time	Operating Period
Monday to Friday	8.00 a.m. – 12.00 p.m.	4 hours
	12.00 p.m. – 1.00 p.m. (lunch hour)	1 hour
	1.00 p.m. – 5.00 p.m.	4 hours
		(Total: 9 hours)
Saturday and Sunday	8.00 a.m. – 12.00 p.m.	4 hours
	12.0 p.m. – 1.00 p.m. (lunch hour)	1 hour
	1.00 p.m. – 4.30 p.m.	3 hours 30 minutes
		(Total: 8 hours 30 minutes)

Table 2.1: Operating Schedule of Royal Selangor Sdn Bhd

2.2 Company History

A pewtersmith named Yong Koon from China arrived in Kuala Lumpur in 1885. A discovery of tin in Malaya attracted him and thousands of other mainland Chinese people, leading him to establish a small business, making household items out of tin at No. 23 Cross Street. Through his persistence and ingenuity, Yong Koon developed his own alloy of tin, antimony, copper, and bismuth called pewter. His first craft was making ceremonial items for ancestral altars of Chinese temples in Kuala Lumpur with other craftsmen.

Yong Koon faced difficulties in his business due to a decline in demand for traditional ceremonial pewter in 1930s. The result of this led him to focus on making products that were in the style of European products for expatriates such as cigarette boxes, ashtrays, vases, teapots, and other utilitarian items. The money he made allowed him and his family to open their shop lot at No. 219 Pudu Road, and the business was renamed Malayan Pewter Works. A few years later, when Yong Koon's second son, Peng Kai, inherited his father's company, it was moved to Batu Road and renamed Selangor Pewter.

In 1970s, the company started to export their products to Singapore, Hong Kong, Germany, Denmark, Japan, Australia, and the UK. Their business was then expanded to include the development, manufacturing, and marketing of precious jewelry and sterling silver under the Selberan and Comyns brand names. In 1979, a royal warrant from the Sultan of Selangor granted the company a royal status and its name was changed to Royal Selangor in 1992.

Until today, the third and fourth generations of Yong family continue to run the business, with over 250 craftsmen and a design team of 40. From timeless gifts, dining accoutrements, to personal accessories, they are now leading the way in expanding the uses of pewter. Aside from collaborating with leaders in pop culture such as Disney and Marvel, the family-run business has also created commission pieces for international luxury giants like LVMH. As part of its ongoing efforts to modernize, Royal Selangor continues to manufacture from its main factory in Setapak, which also houses its award-winning Visitor's Center, one of Kuala Lumpur's most popular tourist attractions. Visitors can admire the fine art of pewtersmithing and take part in exciting workshops.

2.3 Vision and Mission

Vision

Pewter is about possibilities. It is an idea made real, crafted with precision. It evolves and can make tradition timeless. Pewter is our legacy and we are keeping the legacy alive.

Mission

Our mission is to achieve excellence in design, manufacturing and marketing of high-quality home décor, gifts and jewelry. We strive for continuous improvement in every aspect of our business and work toward minimizing the impact of our activities on the environment.

2.4 Organization Chart

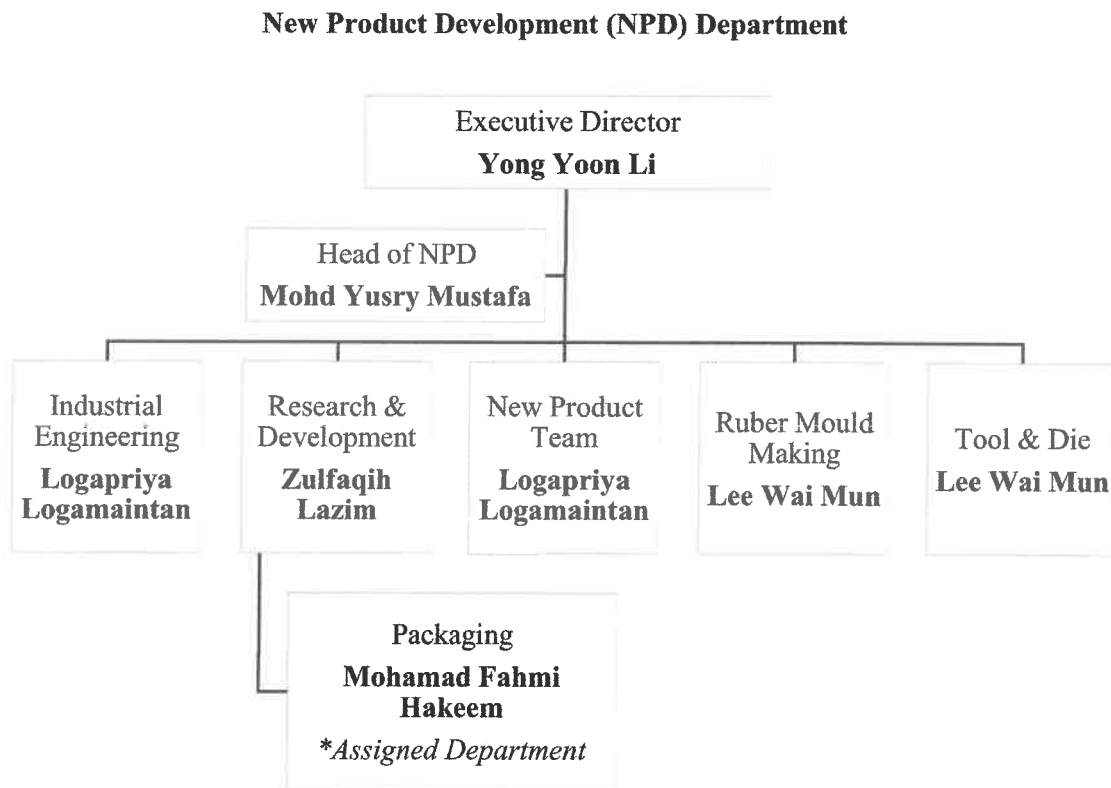


Figure 2.1: Organizational Chart of New Product Development (NPD) Department

2.5 Main Product/Service Provided to the Client

Royal Selangor mainly sells accessories, tableware and gift items that are made of high-quality pewter with 92% to 97% tin, with a small proportion of copper and antimony. The design comes in standard Royal Selangor design or it can be personalized according to clients’ taste.

Royal Selangor also offers premium silverware items under a sister company called Comyns. It specializes in interpretive work, especially that of Paul de Lamerie, one of the most prominent silversmiths of the 18th century. In addition, the company has another sister company called Selberan that specializes in creating 18k gold and diamond jewelry that follows the European approach to artisanship.

3.2 Summary of the Training and Experience Gained

3.2.1 Project 1: Saurus Packaging Cost-Saving

In the first project, I was instructed to reduce the cost in term of packaging aspect by coming up with less complicated and recyclable packaging method. The previous packaging was said to be too complicated for the workers to prepare, thus it made the operation cost higher due to long duration for the workers to pack each item. It was my job to find a simpler packaging method so that the workers can take more time in making the pewter instead of worrying about preparing the packaging.

3.2.2 Project 2: Box Conversion for Photo Frame Boxes

The second project requires me to convert the high cost rigid box to a more environmental-friendly and cost-saving kraft box. Photo frames are the most popular items in Royal Selangor and the existing rigid box that cover the photo frames is beautiful in design and looks very presentable for the customers, however the cost for the rigid box has affected the whole cost for product. In order to solve that problem, I am assigned to create new kraft box that can be used for every existing or future photo frames in Royal Selangor.

3.2.3 Project 3: New Innovation for Standard Item Packaging

In this third project, I was assigned to reduce the usage of non-biodegradable materials Royal Selangor figurines packaging. Before this project, all figurines in Royal Selangor use polyurethane foams as the internal cavity for packaging which is non-biodegradable for the environment. This project allows me to successfully reduce the percentage of non-biodegradable materials in packaging for Royal Selangor standard figurines by combining both non-biodegradable and biodegradable materials in one packaging as well as reducing the cost of polyurethane foams used in the packaging from approximately RM70.00 to approximately RM40.00. The success of cost reduction in packaging aspect has led to this packaging method to be the next standard packaging for all Royal Selangor figurines in the future.

3.2.4 Weekly Activity (Summary of each week)

Weeks	Activities
1	<p>Introduction to Packaging Department (Research and Development)</p> <ul style="list-style-type: none"> • Amend packaging instructions for cost-saving purpose: <ul style="list-style-type: none"> - Box conversion from rigid box to kraft box - Changes in internal cavity from PE bag to bamboo sheet

2	<p>Introduction to Packaging Department (Research and Development)</p> <ul style="list-style-type: none"> • Pack Royal Selangor items according to Royal Selangor standard packaging method. • Construct technical drawings in AutoCAD and change packaging instructions for packaging improvement.
3	<p>First Personal Project: Saurus Packaging Cost-Saving</p> <ul style="list-style-type: none"> • Change packaging method for old Royal Selangor standard items range: Saurus for cost-saving purpose. <ul style="list-style-type: none"> - Come up with cheaper packaging method. - Compare the cost between the old and new packaging. - Amend packaging instructions for future production.
4	*Absent due to COVID-19 (Positive 9 days quarantine)
5	<p>Amendment of Bespoke Item: Be@rbrick 1000% Woodbox</p> <ul style="list-style-type: none"> • Collect the internal dimensions for all Be@rbrick 1000% Woodbox samples for amendment purpose.
6	<p>Amendment of Packaging Instructions for Box Conversion</p> <ul style="list-style-type: none"> • Change packaging instructions from rigid box to kraft box for cost-saving purpose.
7	<p>Amendment of 2020 Factory Layout</p> <ul style="list-style-type: none"> • Measure the area of factory and compare the factory area between 2020 and 2022. • Calculate the new area of each group in factory.
8	<p>Construct Workflow for Packaging Tasks</p> <ul style="list-style-type: none"> • Create a list of existing kraft boxes and find cost for existing internal cavities in Royal Selangor. • Construct workflow for Standard Item, Bespoke Item, LVMH and Box Conversion.
9	<p>Box Conversion (Cost-Saving Purpose)</p> <ul style="list-style-type: none"> • Find existing kraft box and create new kraft box to replace rigid box. • Amend packaging instructions for box conversion.
10	<p>Second Personal Project: Box Conversion for Photoframe Boxes</p> <ul style="list-style-type: none"> • Create new flap kraft box to replace existing rigid box for cost-saving purpose and conduct drop-tests for quality assurance. • Send to Head of Designer for approval.
11	*Hari Raya Aidilfitri Holiday

12	<p>Standard Items: Autumn 2022 Packaging Creation</p> <ul style="list-style-type: none"> • Create standard Royal Selangor packaging method for Royal Selangor Autumn 2022 standard items: <ul style="list-style-type: none"> - Harry Potter, Toolbar, Mujyo • Create packaging instructions for the standard items.
13	<p>Second Personal Project: Box Conversion for Photoframe Boxes</p> <ul style="list-style-type: none"> • Amend technical drawing for flap kraft box, re-conduct drop-tests for quality assurance. • Send to supplier for price quotation.
14	<p>Amendment of Technical Drawings for Standard and Bespoke Items</p> <ul style="list-style-type: none"> • Amend technical drawing for standard items: <ul style="list-style-type: none"> - Mujyo woodbox, Harry Potter sleeve • Amend technical drawing for bespoke items: <ul style="list-style-type: none"> - Be@rbrick 1000% lining (add strap at the ear part)
15	<p>Standard Item: Autumn 2022 Packaging Creation</p> <ul style="list-style-type: none"> • Create standard Royal Selangor packaging method for Royal Selangor Autumn 2022 standard item: <ul style="list-style-type: none"> - Sense II • Create packaging instructions for Sense II.
16	<p>Amendment of Standard Item: Autumn 2022 Packaging Creation</p> <ul style="list-style-type: none"> • Amend packaging for Sense II until packaging are approved by Head of Designer. • Amend packaging instructions for Sense II.
17	<p>Amendment of Internal Cavity for Sense II</p> <ul style="list-style-type: none"> • Amend technical drawing for liner Sense II and send to person in charge for approval.
18	<p>Standard Item: Autumn 2022 Packaging Creation</p> <ul style="list-style-type: none"> • Create standard Royal Selangor packaging method for Royal Selangor Autumn 2022 standard item: <ul style="list-style-type: none"> - Domaine II • Create packaging instructions for Domaine II.
19	<p>Salesman Sample Packaging Preparation</p> <ul style="list-style-type: none"> • Prepare packaging for standard items that are included for Salesman Sample • Send to warehouse within time for shipping to overseas.

20	<p>Third Personal Project: New Innovation for Standard Item Packaging</p> <ul style="list-style-type: none"> • Create new packaging method for Standard Item: Autumn 2022 - DC VII to be applied to other Royal Selangor figurines. • Calculate the cost reduction from old method to new method. • Create packaging instructions for DC VII.
21	<p>Box Conversion (Cost-Saving Purpose)</p> <ul style="list-style-type: none"> • Find existing kraft box and create new kraft box to replace rigid box.
22	<p>Team Project: New Innovation for Existing Standard Item Packaging</p> <ul style="list-style-type: none"> • Come up with ideas to reduce the cost of existing packaging for popular demand products.
23	<p>Second Personal Project: Box Conversion for Photoframe Boxes</p> <ul style="list-style-type: none"> • Check the quality of new flap kraft box arrived and approve to proceed for stock check. • Publish packaging instructions for box conversion from old box to new flap kraft box. <p>Third Personal Project: New Innovation for Standard Item</p> <ul style="list-style-type: none"> • Check the quality of the samples arrived and approve to proceed with bulk order.
24	<p>Team Project: New Innovation for Existing Standard Item Packaging</p> <ul style="list-style-type: none"> • Completed the project by amending the packaging instructions.

CHAPTER 4

DETAILS OF EXPERIENCES

4.1 Introduction

Assigned by superior to be in the Packaging Department, under the Department of Research and Development of Royal Selangor, the projects assigned to me are all packaging-related projects. Align with Royal Selangor's mission to strive for continuous improvement in every aspect of their business and work toward minimizing the impact of their activities on the environment, the main focus of my projects is to improve the quality and at the same time, keeping the environment safe by using environmental-friendly materials for Royal Selangor packaging.

The first project assigned to me is Saurus Packaging Cost Saving where I am instructed to reduce the cost in term of packaging aspect by coming up with less complicated and recyclable packaging method. The previous packaging was said to be too complicated for the workers to prepare, thus it made the operation cost higher due to long duration for the workers to pack each item. It was my job to find a simpler packaging method so that the workers can take more time in making the pewter instead of worrying about preparing the packaging.

My second assignment was to convert the high cost rigid box to a more environmental-friendly and cost-saving kraft box. The project is called Box Conversion for Photo frame Boxes. Photo frames are the most popular items in Royal Selangor and the existing rigid box that cover the photo frames is beautiful in design and looks very presentable for the customers, however the cost for the rigid box has affected the whole cost for product. In order to solve that problem, I am assigned to create new kraft box that can be used for every existing or future photo frames in Royal Selangor.

Lastly, the third project assigned to me is called New Innovation for Standard Item Packaging. Before this project, all figurines in Royal Selangor use polyurethane foams as the internal cavity for packaging which is non-biodegradable for the environment. This project allows me to successfully reduce the percentage of non-biodegradable materials in packaging for Royal Selangor standard figurines by combining both non-biodegradable and biodegradable materials in one packaging.

4.2 Details of Training and Experiences Gained

4.2.1 Saurus Packaging Cost-Saving

Problem Statement

Starting from 2019, Royal Selangor is aiming to reduce the usage of non-biodegradable materials in their production and the most effective way to do so is by changing the materials used in packing the items. The previous packaging designers came up with the idea to change the materials used for the internal cavity. Internal cavity is placed inside the box, functioned to prevent any damages on the items as well as protecting the items from breaking. Most of the internal cavities used for Royal Selangor packaging are polyurethane foams and polystyrene. It is well-known that these materials are non-biodegradable and can affect the environment. To solve this problem, Royal Selangor packaging designers decided to replace these non-biodegradable materials with corrugated cardboard. This cardboard comes in different sizes and types, but Royal Selangor uses E-flute type with the thickness of 1.5mm for their packaging.

Royal Selangor packaging designers have created so many designs of internal cavities using corrugated cardboard. These internal cavities are called E flute liner. Most of the designs required some folding to achieve the desired shape that will protect the products inside the box. However, these folding sometimes are too complicated and it takes time for workers to fold one liner for one item. If the time taken for the worker to prepare the packaging is long, it will affect the operation cost for the product. The longer the duration, the higher the cost for the operation. In order to reduce the operation cost, it is important to come up with an environmental-friendly and cheaper method to pack the item.

Starting from 2021, Research and Development Department of Royal Selangor came up with another environmental-friendly method to pack the products. This method is called Ranpak Method which they will be using papers to wrap the items and the papers will act as the internal cavities. The papers consist of Geami brown paper, Geami white paper and stitched paper. This alternative is the simpler way to pack the item with lower cost compared to using the E-flute liner. For now, Ranpak Method is the standard method for packing the standard Royal Selangor items and they are trying to amend the old items to be changed to Ranpak packaging. Hence, I was assigned to change the packaging for one existing standard item range called Saurus to a less complicated and more affordable packaging methodology. I need to come up with creative Ranpak wrapping method that should secure the products from any damages and at the same time, reducing the cost of the packaging from using E-flute liner to Ranpak wrapper.

Objective

The main objective of this project is to reduce the cost of the packaging for existing standard items range Saurus. In addition, the project aims for the packaging to pass the drop test to ensure the quality of the packaging before selling it out to the customers. At last but not least, the purpose of this packaging conversion is to minimize the duration of packaging preparation during production in the future.

Methodology and Result

The project started with calculating the cost of existing packaging including the operation cost for Saurus items. After the cost has been calculated, the data was sent to superior, Nik Camelia Nik Omar Al-Haded for her review.

Name	Code	Box	Price (RM)	Cavity	Price (RM)	Operation Costs (RM)	Total (RM)
Stegosaurus Card Holder	016043R	PB06001	RM2.49	PL03030	RM3.78	RM2.91	RM11.17
				PL03031	RM1.42		
				PF02040	RM0.03		
				PF04102	RM0.02		
				PM03010	RM0.16		
				PZ03443	RM0.35		
Triceratops Container	016343R	PB06001	RM2.49	PL03030	RM3.78	RM2.91	RM11.17
				PL03031	RM1.42		
				PF02040	RM0.03		
				PF04102	RM0.02		
				PM03010	RM0.16		
				PZ03443	RM0.35		
Pterodactyle Magnifying Glass	016346R	PB06026	RM3.82	PL03033	RM2.52	RM2.91	RM9.88
				PF04102	RM0.02		
				PF02040	RM0.03		
				PF02041	RM0.05		
				PF02042	RM0.08		
				PM03005	RM0.09		
				PZ03443	RM0.35		
T-Rex Pencil Sharpener	016348R	PB06001	RM2.49	PL03030	RM3.78	RM2.91	RM11.17
				PL03031	RM1.42		
				PF02040	RM0.03		
				PF04102	RM0.02		
				PM03010	RM0.16		
				PZ03443	RM0.35		
Velociraptor Letter Opener	016348R	PB06001	RM2.49	PL03030	RM3.78	RM2.91	RM11.22
				PL03032	RM1.47		
				PF02040	RM0.03		
				PF04102	RM0.02		
				PM03010	RM0.16		
				PZ03443	RM0.35		

Table 4.1: Cost Calculation for Existing Saurus Packaging

The project continues with loaning the items from warehouse for study purpose. After receiving the items from warehouse, each items required some inspections including measuring the dimensions of the items and identifying the most fragile areas of each item as well as the observing of the old packaging. After reviewing the items, all materials for new packaging were prepared. The materials include kraft box, stitched papers, polyethylene bags and Ranpak wrapper as well as master carton box and polystyrene for drop tests purpose. Before conducting

The item that has no damage were then proceeded to be shown to the superior for design approval meanwhile the one that has some damages were sent to be fixed by pewtersmith at the Model Shop. The fixed item then went through the same processes where another packaging design ideas were generated and another drop tests were conducted until no damage to be seen. After all designs were approved by superior, the cost for new packaging were calculated and compared with the cost for old packaging.

Box	Price (RM)	Cavity	Price (RM)	New									Total (RM)
				Geami Brown Paper (PF07006)			Geami White Paper (PF07007)			TT Greenline Stitched Paper (PF07008)			
				L (mm)	L (m)	RM	L (mm)	L (m)	RM	Price (RM)	L (cm)	RM	
PB06001	RM2.49	PF02040	RM0.03	400	0.4	RM0.40	350	0.35	RM0.06	RM0.42	60	RM0.25	RM4.32
		PF04102	RM0.02										
		PM03010	RM0.16										
		PZ03443	RM0.35										
		PZ03035	RM0.50										
		PZ03094	RM0.06										
PB06001	RM2.49	PF02040	RM0.03	400	0.4	RM0.40	350	0.35	RM0.06	RM0.42	60	RM0.25	RM4.32
		PF04102	RM0.02										
		PM03010	RM0.16										
		PZ03443	RM0.35										
		PZ03035	RM0.50										
		PZ03094	RM0.06										
PB06022	RM3.82	PF02040	RM0.17	550	0.55	RM0.55	500	0.5	RM0.09	RM0.42	100	RM0.42	RM6.50
		PF02041	RM0.05										
		PF04102	RM0.02										
		PF04100	RM0.01										
		PM03032	RM0.47										
		PZ03443	RM0.35										
		PZ03035	RM0.50										
PZ03094	RM0.06												
PB06001	RM2.49	PF02040	RM0.03	400	0.4	RM0.40	350	0.35	RM0.06	RM0.42	60	RM0.25	RM4.32
		PF04102	RM0.02										
		PM03010	RM0.16										
		PZ03443	RM0.35										
		PZ03035	RM0.50										
		PZ03094	RM0.06										
PB06001	RM2.49	PF02040	RM0.03	500	0.5	RM0.50	400	0.4	RM0.07	RM0.42	60	RM0.25	RM4.45
		PF04102	RM0.02										
		PM03010	RM0.16										
		PZ03443	RM0.35										
		PZ03035	RM0.50										
		PZ03094	RM0.06										

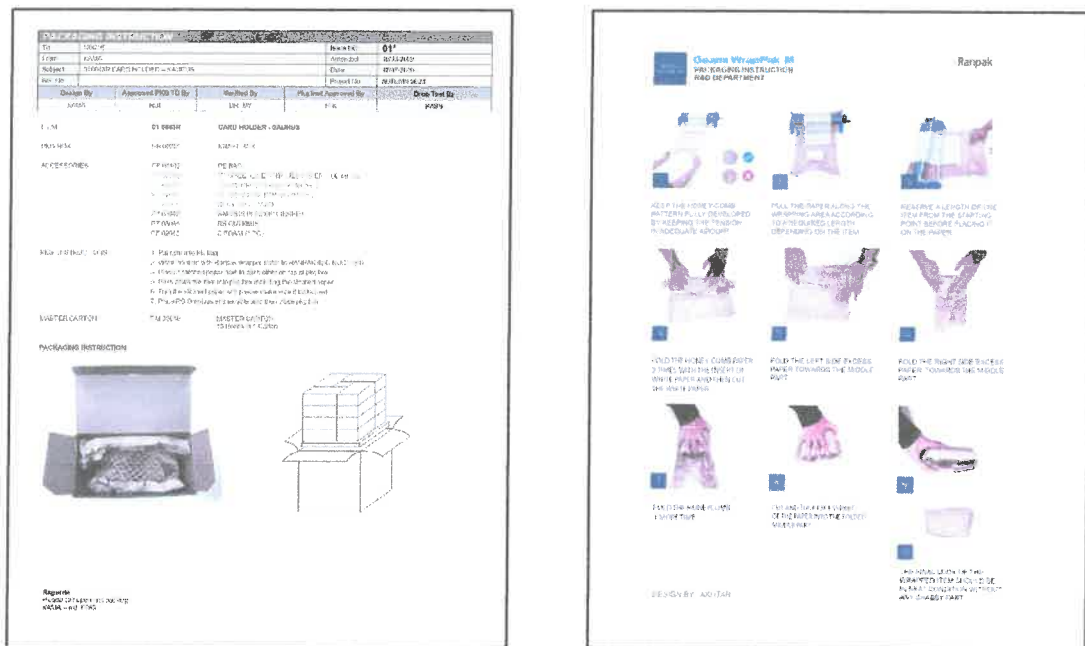
Table 4.2: Cost Calculation for New Saurus Packaging

Item		Packaging Saving (RM)
Name	Code	
Stegosaurus Card Holder	016043R	RM6.85
Triceratops Container	016343R	RM6.85
Pterodactyle Magnifying Glass	016346R	RM3.38
T-Rex Pencil Sharpener	016348R	RM6.85
Velociraptor Letter Opener	016348R	RM6.77

Table 4.3: Cost Reduction of Saurus Packaging from old to new

After the data was reviewed and approved by superior, the project continued to the next step which was the amendment of the packaging instructions. The new packaging materials were amended into the existing packaging instructions and then were sent to superior for approval. After obtaining approval from superior, the packaging instructions then were published to everyone involved in the production of Saurus product.

This step is one of the most crucial step in this project because the details in the packaging instruction will be keyed into the database. The amount of materials mentioned in packaging instruction need to be thoroughly counted and transferred to ensure its accuracy. The carelessness in this aspect may lead to the complication in term of the cost and during the mass production of the item. On top of that, the workers will be referring to the packaging instructions to prepare the item that will be sold to the customers. The instructions need to be as simple and clear as possible to ensure the accuracy of the packaging prepared by the production workers.



1.	REMARKS	CHANGE	PL 03030	LIHER EF
			PL 03031	LIHER INSERT
REASONS	NEW PACKAGING MATERIAL	TO	PF 07006	GEAMI BROWN PAPER (400mm)
			PF 07007	GEAMI WHITE PAPER (350mm)
			PF 07008	TT GREENLINE STITCHED PAPER (30cm) x2

Figure 4.3: Examples of Amended Packaging Instruction for Saurus

After all, the objectives of the project have been achieved. The cost of the packaging has been reduced and it has shown a significant result. All packaging designs also have passed the drop tests and approved by the superior. At last but not least, the duration of the packaging preparation has been significantly reduced.

4.2.2 Box Conversion for Photo Frame Boxes

Problem Statement

Photo frames are the most popular and best-selling items in Royal Selangor. Variety of designs and sizes of photo frames can be found in Royal Selangor archive. The standard sizes of photo frames that can be seen in Royal Selangor includes 3R, 4R, 5R, 6R and 8R. Due to its high and popular demand, the production of photo frames is made in huge quantity and produced every day. When the item is being mass produced, it is for sure comes with good packaging to be presented to the customers.

Variety of designs of photo frames calls out for variety designs for its packaging as well. There is no standard packaging for photo frames, it all comes in different boxes and internal cavities. Most of the packaging for photo frames uses rigid boxes and polyurethane foams as its internal cavity. However, even though the packaging looks beautiful and presentable for the customers, the cost for each packaging is unbearable. It has been noted that the packaging costs have affected the overall cost of the product. On top of that, some nature-loving customers have complained that the packaging does not keep the environment safe. The usage of rigid box as the external packaging is safe, however the layer of the box is coated with plastic materials. That has made the box to be non-recyclable. In addition, the usage of polyurethane foams and polyethylene bags as the internal cavities could also lead to plastic pollution. These materials are known to be non-biodegradable and takes a thousand years for it to be decomposed. The increase amount of these materials in the environment can cause some serious pollution especially in the land and water area.

In order to solve this problem, packaging designers need to come up with new idea to use cost-effective and eco-friendly materials for the packaging of photo frames. Instead of using different packaging for different designs of photo frames, I am assigned to create a standard box that can be used for existing photo frames as well as the photo frames that will be created in the future. The new packaging design is supposed to be a lot cheaper than the packaging that exist in Royal Selangor.

Objective

The main objective of this project is to create a standard packaging for the existing and the future photo frames in Royal Selangor. On top of that, the aim of this project is to use biodegradable materials for the photo frames' packaging. Last but not least, this project aims to keep the cost of the packaging for photo frames to be as low as possible.

Methodology and Result

The project began with analyzing the workflow of box conversion.

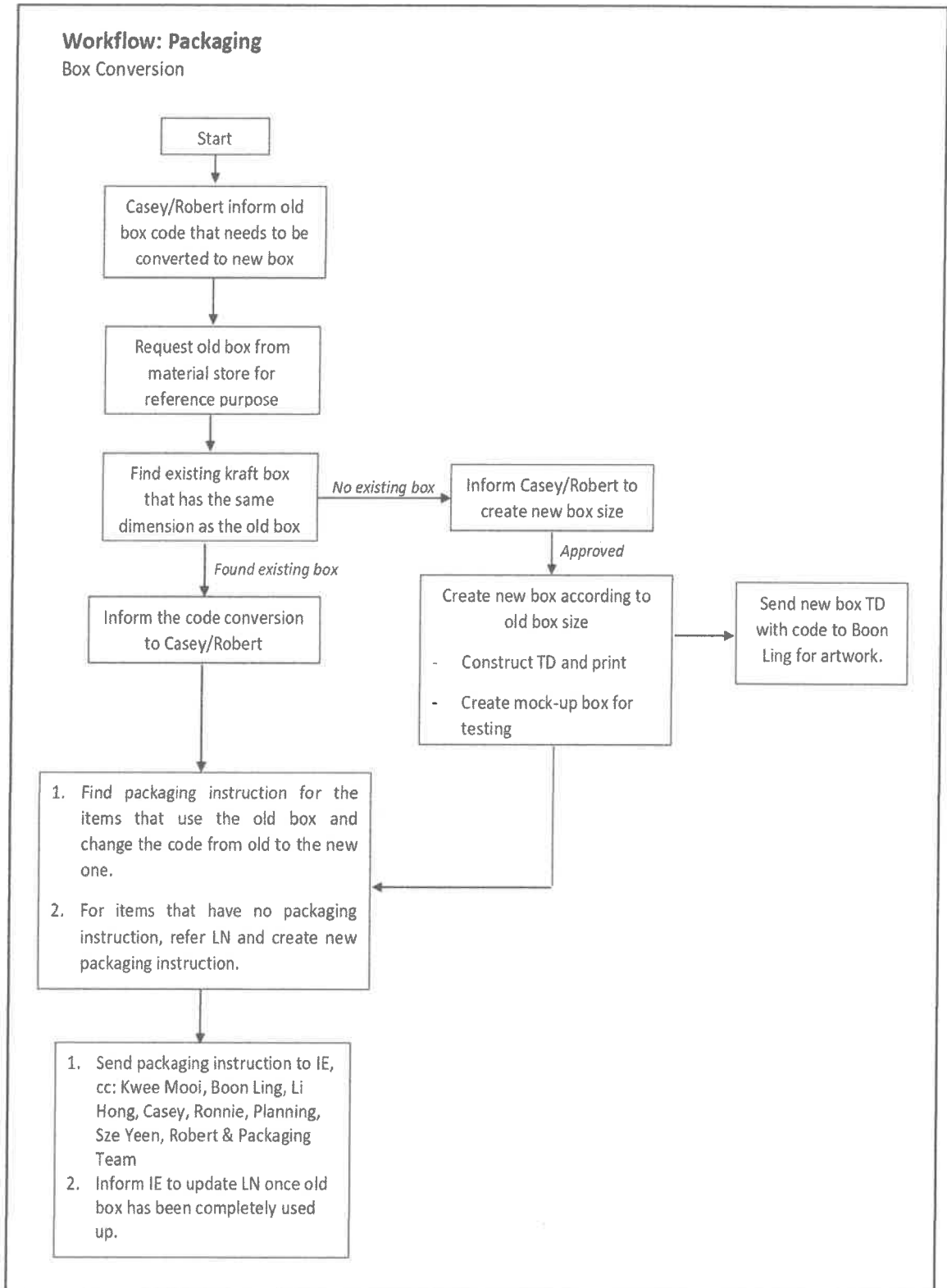


Figure 4.4: Workflow of Box Conversion

A request to the supervisor in the Material Store, Robert, was made to change rigid box packaging to kraft box. This project will alter the packaging for three sizes of photo frames, namely 4R, 5R, and 8R. In response to the Material Store's request, Industrial Engineering technician Mala created new codes for the kraft box.

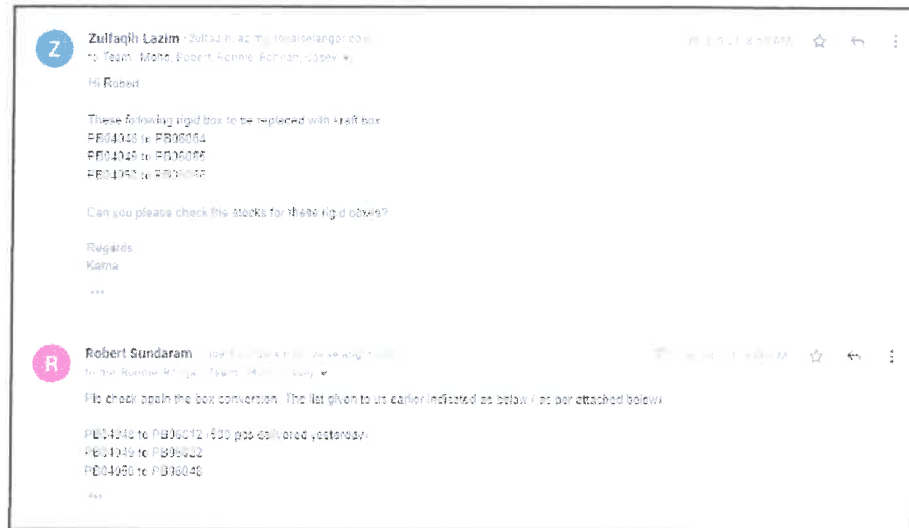


Figure 4.5: Email Conversation with Robert regarding Box Conversion

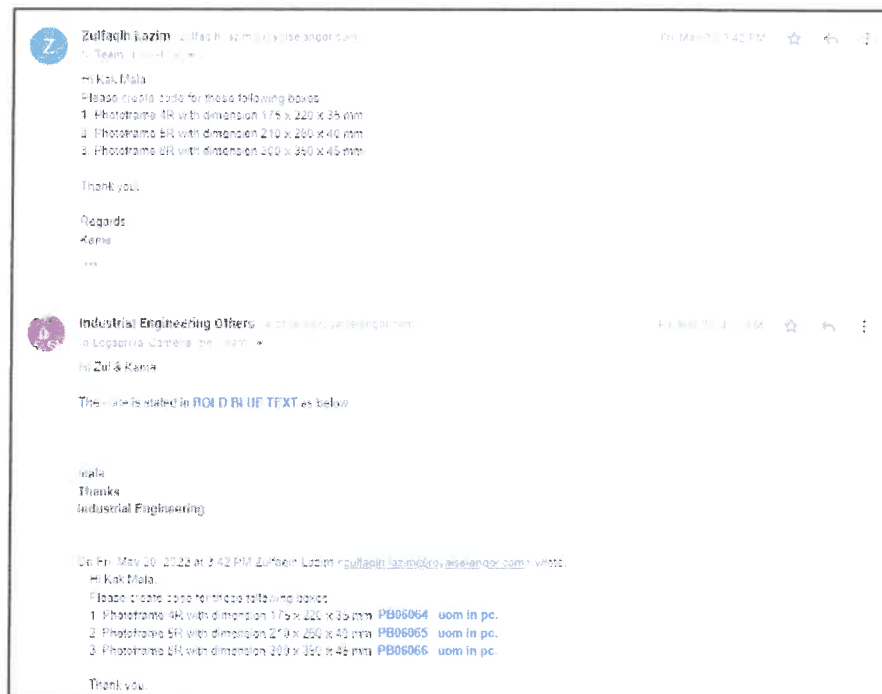


Figure 4.6: Email Conversation with Mala regarding New Codes Creation

After the codes have been created, the boxes were drawn in AutoCAD and printed in its actual size for mock-up sample.

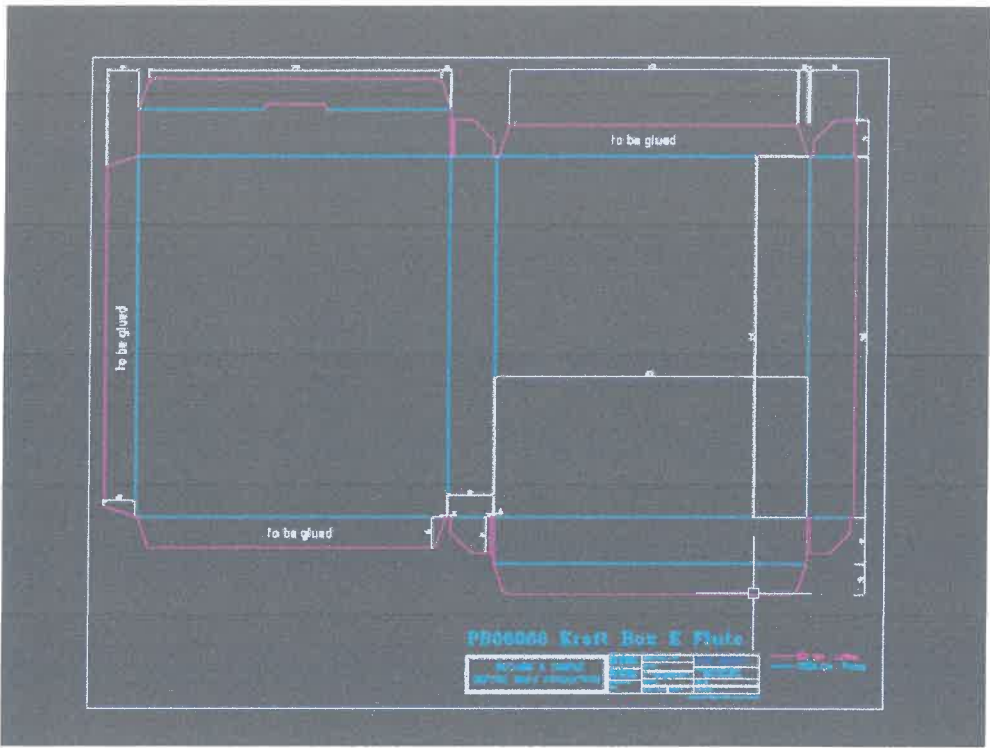


Figure 4.7: Drawing of 8R Photo frame Box in AutoCAD



Figure 4.8: Drawing of 8R Photo frame Box in PDF file

After printing, the drawings were glued to E-flute corrugated cardboard and cut. A box was then constructed from the cut designs. For quality assurance, the boxes were dropped with

photo frame samples. Following the successful drop tests, the boxes' designs were presented to Head of Designer, Richard de Lancey for approval. Once approved, a copy of the drawings was sent to the Planning Department for quotations from the supplier and then to designers for artwork.

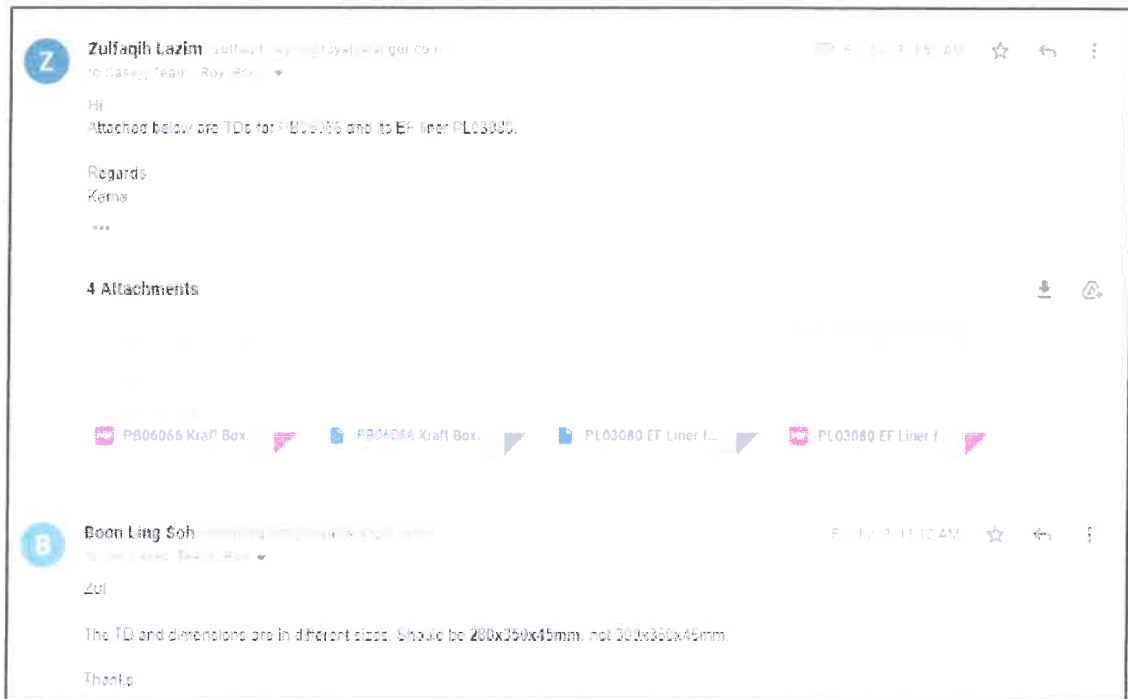


Figure 4.9: Email Conversation regarding Box Conversion with Boon Ling and Casey

After a few weeks, the samples from the supplier were sent to the Packaging Department for quality check before any approval was done. Samples are compared with drawings and the material thickness of boxes is checked as part of the quality check. The quality check was done by the packaging designer who is in charge of designing the boxes. The box's cost (quoted by the supplier) was then summed with the internal cavity costs. Afterwards, the total cost was reviewed with the superior and discussed. A second email was then sent to Casey with instructions for ordering boxes in bulk for later production. Following the bulk order, the boxes arrived in the Material Store with each box (4R, 5R and 8R) containing 500 pieces. For the last quality check, a packaging designer was needed again. Boxes were stored in the Material Store and quantities were entered in the database after approval.

Last but not least, the packaging designer was responsible for amending the packaging instructions for existing photo frames. This action was done to inform the workers at Royal Selangor that the boxes for photo frames had been changed. Following the amendments to the packaging instructions, the files were distributed to all Royal Selangor workers. Industrial Engineering technicians will then enter the new data into the database.

PACKAGING INSTRUCTION			
To	PP/PE	Revised By	04
From	KAMA	Approved	25/07/2022
Subject	013400A PHOTOFRAME DRAYTON BR PALLADIO 013413A PHOTOFRAME BRISTOL BR PALLADIO 013416R PHOTOFRAME BR HIMALAYA 013448R PHOTOFRAME BR CLIMBING ROSES MM		
Proj No		Project No	

ITEM	01 3403A	PHOTOFRAME DRAYTON BR PALLADIO
	01 3413A	PHOTOFRAME BRISTOL BR PALLADIO
	01 3416R	PHOTOFRAME BR HIMALAYA
	01 3448R	PHOTOFRAME BR CLIMBING ROSES MM

PKG BOX	PP 1404	PP 1404 (LAW BOOK)
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ADJL SURFACES	PP 0401	PP 0401 (STICKY)
	PP 0402	PP 0402 (STICKY)
	PP 0403	PP 0403 (STICKY)
	PP 0404	PP 0404 (STICKY)
	PP 0405	PP 0405 (STICKY)
	PP 0406	PP 0406 (STICKY)
	PP 0407	PP 0407 (STICKY)
	PP 0408	PP 0408 (STICKY)
	PP 0409	PP 0409 (STICKY)
	PP 0410	PP 0410 (STICKY)
	PP 0411	PP 0411 (STICKY)
	PP 0412	PP 0412 (STICKY)
	PP 0413	PP 0413 (STICKY)
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	PP 0415	PP 0415 (STICKY)
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	PP 0470	PP 0470 (STICKY)
	PP 0471	PP 0471 (STICKY)
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	PP 0496	PP 0496 (STICKY)
	PP 0497	PP 0497 (STICKY)
	PP 0498	PP 0498 (STICKY)
	PP 0499	PP 0499 (STICKY)
	PP 0500	PP 0500 (STICKY)

PKG INSTRUCTIONS

1. Cover board with PP bag then wrap item with PP sheets
2. Place PP liner into pkg box then place the item
3. Fill empty spaces both top and bottom with blanked papers
4. Put PP sheets inside then close pkg box
5. Label the master carton

MASTER CARTON	PP 0304	PP 0304 (LAW BOOK)
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PACKAGING INSTRUCTION

G Form 42

C Form 43

Remarks
Please call us for packing
KAMA - ext. 6268

1.	REMARKS	CHANGE	PP 0304	PP 0304 (LAW BOOK)
	REVISIONS	CHANGE PACKAGING BOX	PP 0304	PP 0304 (LAW BOOK)
2.	REMARKS	CHANGE	PP 0304	PP 0304 (LAW BOOK)
	REVISIONS	CHANGE MASTER CARTON	PP 0304	PP 0304 (LAW BOOK)
3.	REMARKS	CHANGE	PP 0304	PP 0304 (LAW BOOK)
	REVISIONS	CHANGE MASTER CARTON	PP 0304	PP 0304 (LAW BOOK)
4.	REMARKS	CHANGE	PP 0304	PP 0304 (LAW BOOK)
	REVISIONS	CHANGE INTERNAL CAVITY	PP 0304	PP 0304 (LAW BOOK)

Figure 4.10: Examples of Packaging Instruction for Box Conversion

To conclude, the objectives of this project have all been achieved. The standard packaging for photo frames has been created and have already been applied to all existing photo frames in Royal Selangor. Secondly, the materials of the boxes and the internal cavities used for this project were all biodegradable and recyclable. The materials include bamboo sheet and E-flute corrugated cardboard. Lastly, the cost for the packaging for the photo frames was discussed and reviewed. The discussion has resulted to the agreement where it is affordable. The cost also was said to be the lowest throughout years of the packaging for photo frames in Royal Selangor.

4.2.3 New Innovation for Standard Item Packaging

Problem Statement

Royal Selangor's mission is to minimize the impact of their activities to the environment. Aligning with their mission statement, starting from 2019, they intend to reduce non-biodegradable materials in their production, and the most effective way to do this will be to change the packaging materials. As mentioned in the first and second project, most of the internal cavities used in the packaging in Royal Selangor are polyurethane foams and polyethylene especially during the packaging of Royal Selangor's figurines.

Figurines are considered to be the most fragile items in Royal Selangor and the packaging for the items need to be extremely secure and thick in order to protect the figurines from any damages. Previous packaging designers came up with the idea to use polyurethane foams and polyethylene sheets to pack the item, however, the materials are non-biodegradable and non-recyclable. On top of that, the cost of polyurethane foams used for each figurine in Royal Selangor can exceed RM70.00, which is said to be too costly for a packaging. If summed up with the cost of the box and other external and internal cavities such as special printed sleeve, product inserts and E-flute liners, the total cost can exceed RM100.00. The highest budget for overall packaging cost for Royal Selangor standard items should not exceed RM100.00 unless it is for special order and requested by the clients themselves. Seeing this issue, Royal Selangor decided to change the packaging materials of figurines series due to its effect to the environment. In addition, the high cost of the packaging materials can affect the whole cost of the figurine production, thus this matter should be taken on hand.

However, due to Royal Selangor figurines' fragility, the packaging materials cannot be changed to one hundred percent of biodegradable and recyclable materials. If do so, the company will face some huge lost due to the damages found on the figurines, as the fully biodegradable materials cannot protect the figurines from any bents and breakages. To solve this problem, the action that needs to be done is to only reduce the percentage of non-biodegradable materials inside the box instead of completely eliminating them.

For this project, the figurines used for new innovation of standard item packaging are Batman and Superman. These figurines are in the range of DC VII, the products under standard items of Autumn 2022. These figurines are the latest items in standard items of Autumn 2022 which means that the design is newly made; never being shown to the customers yet. Changing the packaging for this season's figurines will automatically change the method of other Royal Selangor's figurines in the future.

Objective

The main objective of this project is to reduce the usage of non-biodegradable materials in figurines' packaging. On top of that, the aim of this project is to reduce the cost of polyurethane foams used in figurines' packaging. Lastly, this project is conducted to create a new standard packaging for Royal Selangor figurines.

Methodology and Result

The project began with analyzing the workflow of standard item packaging.

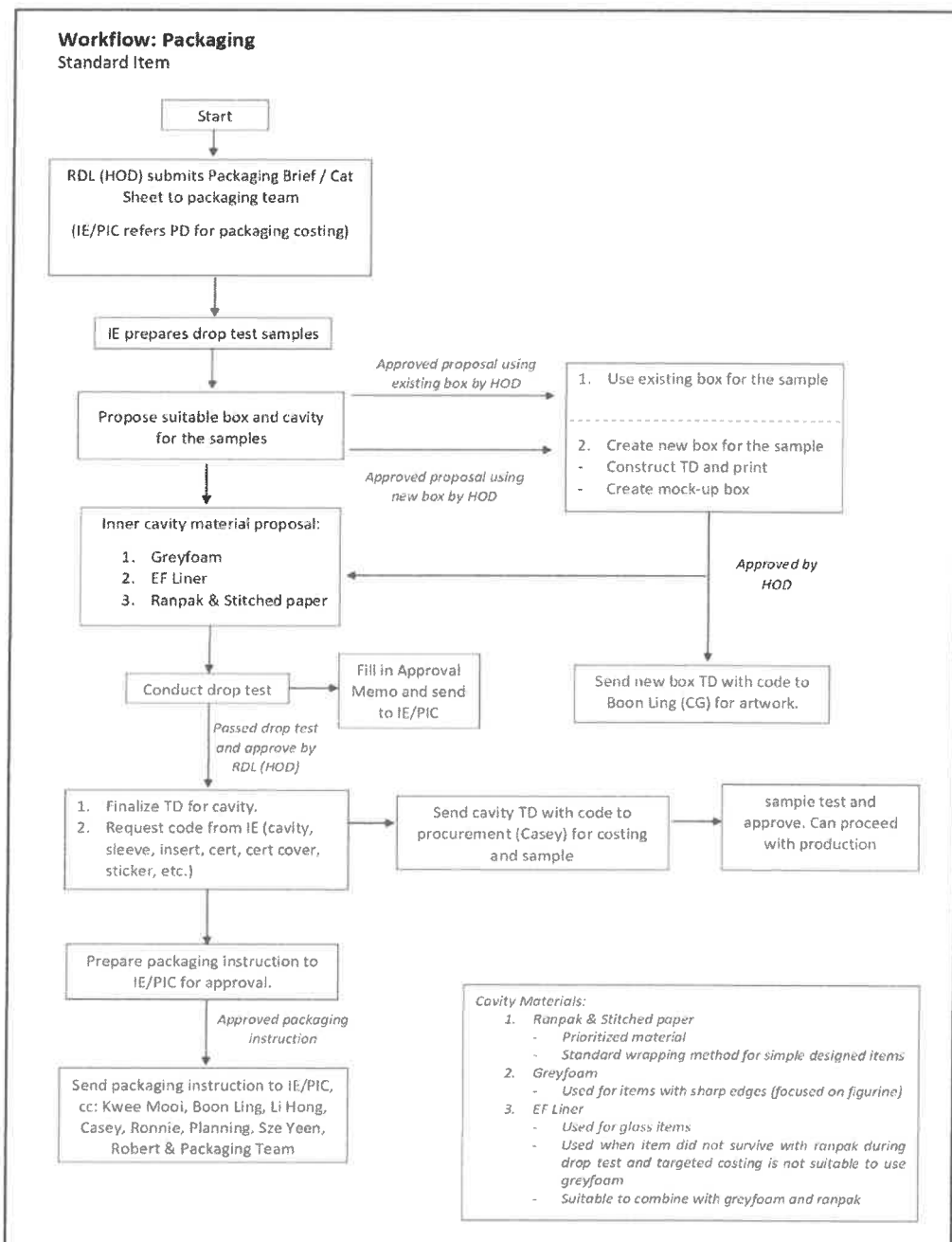


Figure 4.11: Workflow of Standard Item Packaging

For Autumn 2022 standard items, Royal Selangor has released a range of interesting products such as Domaine II, Harry Potter II, Marvel XI, Toolbar, Mujyo, Year of the Rabbit and DC VII. Each range was handled by different industrial engineers in the New Product Development Department. The person in charge (PIC) for DC VII range is Logapriya Logamaintan, Senior Executive in Industrial Engineering Department.

The first step for preparing standard item packaging is by receiving the item samples and approval memo from PIC. Approval memo is a form where the weight of packaging, as well as the code and dimensions of the box and master carton were requested to be filled in by packaging designer and to be re-sent to the PIC. When the samples and approval memo had been given, packaging designer's task was to find a suitable box, internal cavities and master carton box for the item. On top of that, packaging designer was needed to estimate the total packaging cost for PIC to prepare the budget for the packaging materials.

After the approval memo had been filled in and sent to PIC, packaging designer had to start to generate the packaging design idea and conduct a drop test. Due to the figurines' complicated design, this step was a series of trial and error processes; few polyurethane foams designs were created (drawn by hand and AutoCAD), tons of designs of internal cavities were proposed, and several drop tests were performed.

After an episode of research and development, the internal cavities design was finalized, and the drop test had passed. The finalized design was shown to Head of Designer, Richard de Lancey for approval. The design proposed consists of a kraft box, two pieces of E-flute liners that were placed at the inside surface of the box, five pieces of 100cm stitched papers to be placed at the bottom of the box as the base, 18.5cm-thick of polyurethane foams and 100cm x 50cm of bamboo sheet that will act as the wrapper for the figurine.

After the design had been approved by Richard, the total cost for the packaging was calculated and presented during the meeting with Head of New Product Development Department, Dr. Mohd Yusry Mustafa and engineers from Industrial Engineering and New Product Team Department. The discussion had come to a conclusion where the cost is acceptable and within budget which was estimated to be around RM75.00.

The agreement leads to the next step which was to send the drawing to Planning Department and Design Department for price quotation from the supplier and packaging artwork, respectively. The drawings consist of the design of polyurethane foams, E-flute liners and sleeve for kraft box. These drawings need to be sent immediately in order to get the price quotation as soon as possible so that the actual cost for packaging could be calculated.

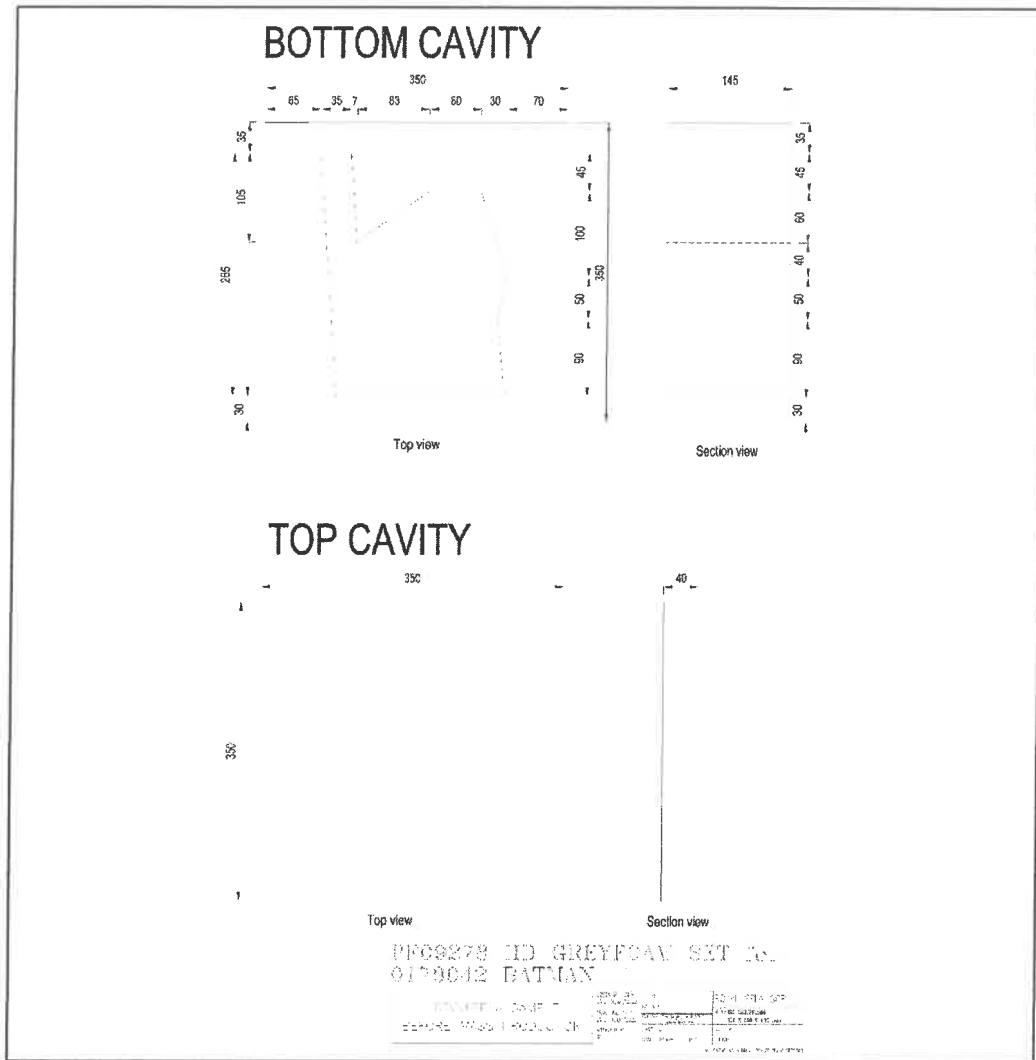


Figure 4.12: Example of Polyurethane Foam Design for Batman Figurine

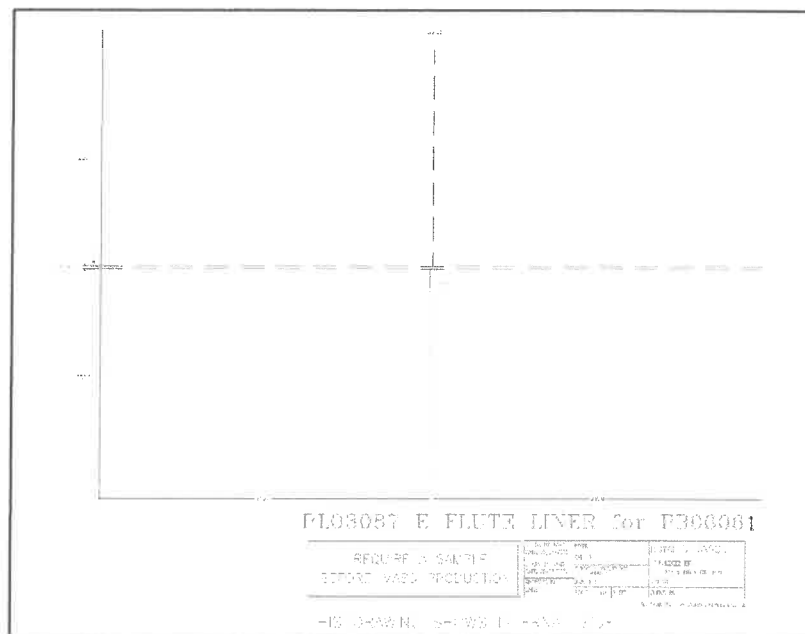


Figure 4.13: E-Flute Liner Design for Kraft Box

A few weeks later, the supplier sent the samples for each design and it was the packaging designer's responsibility to ensure these samples met the highest quality standards. In addition, the actual cost received from the supplier was once again presented to the superiors to be reviewed. Once the quality and the cost of the items were approved, the approval email was sent to Planning Department for them to order the packaging materials in a large quantities for mass production.

For the next process, packaging designer is required to construct packaging instructions. These packaging instructions were created to teach the production workers on how to pack the item before releasing the products. On top of that, the packaging instructions are required to ensure that all the details about packaging materials were keyed into the database. After creating the packaging instructions, the files were sent to PIC (Logapriya Logamaintan) for approval. After being approved by PIC, the packaging instructions were published to everyone involved in the production of DC VII.

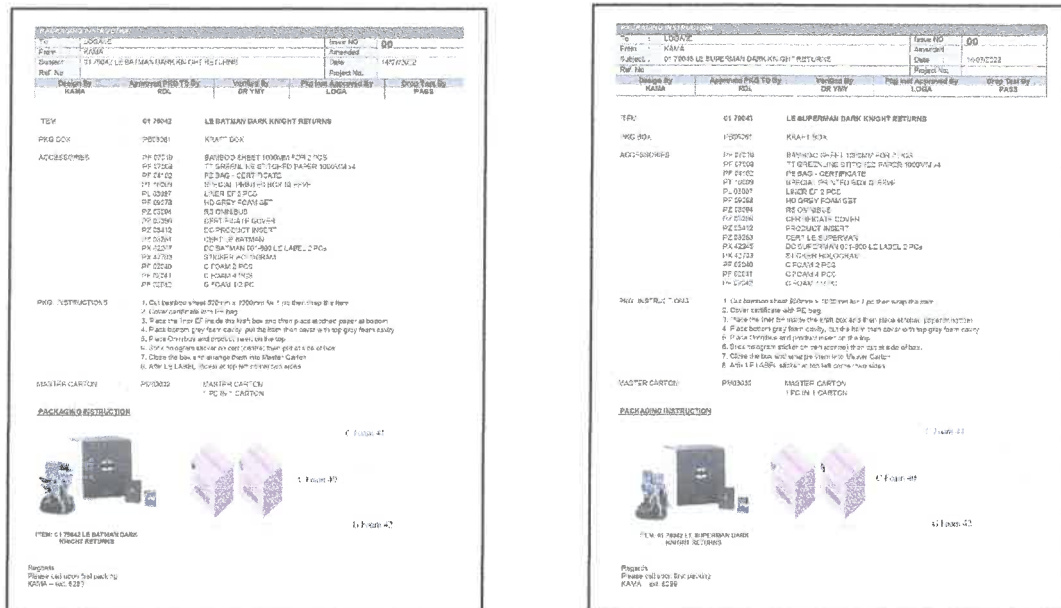


Figure 4.14: Packaging Instruction for Batman and Superman Figurine DC VII

In conclusion, the objectives of this project had been successfully achieved. The usage of non-biodegradable material in figurines' packaging were reduced. Both non-biodegradable and biodegradable materials were combined in one packaging. This is the first time in Royal Selangor history for both materials to be combined in figurines' packaging. Next, the cost of polyurethane foam used in the packaging has been reduced from RM70.00 to RM40.00. This was a huge reduction for figurine's packaging. Last but not least, the packaging has been set as the standard packaging for Royal Selangor figurines in the future.

4.3 Problems Encountered and Approach Adopted for Solving Problems

Throughout 24 weeks being in packaging department, I have encountered several problems in terms of packaging aspect. As an intern with little to no working experiences, the challenges I have faced mainly due to my lack of knowledges and skills in certain areas.

When I was first assigned to be in packaging department, I was supervised under a packaging designer. There was only me and him in the department so all I did was learning everything from him regarding packaging matters. However, the packaging designer decided to leave the company two months after I enter the company as an intern, hence making me the only person who can take over the job as a packaging designer while waiting for the company to employ a new designer. With little knowledge in packaging area, I became a temporary replacement for a packaging designer position. While handling my projects, I encountered some difficulties especially in term of expertness and resources. Most of my tasks and projects requires me to design, create and draw the boxes and internal cavities such as liners and grey foams. However, with no guidance, I had no sources to refer to the design and I had no idea to what I was supposed to do as my next step such as to whom should I send the drawing to and to whom to do I ask for the packaging approval?

As for the solution, I decided to take the matters on my own and referred to the previous designers' files and email histories. In creating the boxes and internal cavities, it could be a hassle for me to come up with my own idea when I have no experience and knowledges in packaging, thus, I just solely followed the design drawn and created by the previous designers. After referring to the references, I have drawn more than five boxes, and designed more than five packaging, all thanks to the previous designers who have left their marks in Royal Selangor archive. I also took a courage to go and ask guidance from the people in the office especially from Dr. Mohd Yusry, the Head of New Product Development Department. Packaging department is under Dr. Yusry's supervision and I believed he would know the answer to all my problems and my guess was right. During my days in packaging department, most of the solutions for the problems regarding packaging were settled by Dr. Yusry. He always knew the answer to most of the issues and offers me wide choices of solutions for each problem.

Other than that, the problems that I usually encountered as a temporary packaging designer was to deal with the people who kept on urging me to get the packaging works to be done as soon as possible without considering that I am an intern who knows nothing about packaging. This problem is no doubt a normal thing to happen in every company and the only solution for this issue is to negotiate with the person and comes to a beneficial agreement for both parties.

4.4 Professional and Ethical Issue

During my involvement in industrial training, here are some of professional and ethical issues that arise. Given that such a thing is a thing that often happens, it is regarded as a trivial matter but if it is seen in the long run, it will affect the performance, and this can spread and become so entrenched in the culture of the firm.

The workload for the interns is as equal as for the permanent workers. As mentioned in the problems encountered, I was assigned to take on a position as a temporary packaging designer. I was originally assigned to be in the industrial engineering department, aligning with the course that I took which is Diploma in Chemical Engineering. However, I was transferred to the packaging department due to the shortage of the workers. As a result, I, as an intern was the one to be in charged for the packaging department. With no supervision, treated like a permanent employee, taking on packaging jobs have become my responsibility and dealing with superiors, attending meetings and handling huge projects have become my daily jobs. Feeling responsible for the works, I even worked overtime without getting any payment. Some complaints have been raised; however, no further action was taken.

Furthermore, one thing that I have been observing and experienced myself throughout 24 weeks in this company, I have come to a conclusion where Royal Selangor has little to no level of authority. As an intern, it is beyond my right and ability to approve or make any decisions for any issues occurred in the company. I am supposed to be the person who only follows the instructions and receives orders. However, being transferred into a department where I was the one to be in charged, all problems were placed on my shoulder and I was expected to know the answers to all the problems. It was an unpleasant experience when high position individuals, that being said positions such as managers and executives, to expect an interns to have the answers to their problems. In my opinion, they should forward all the questions to head of packaging department to resolve the issues instead of throwing it off to an intern.

To conclude, the root of the problems above is due to the shortage of workers. The problem of lack of staff in a company is very worrying because this will cause the work to be delayed and not operated to meet the demand of customers. It will damage the reputation of the company if it continues. To avoid such a thing, the company need to hire more staff to make the work easier and not use trainee to do the work.

4.5 Health, Environmental and Sustainable Aspect

Occupational health at work primarily focuses on preventing injuries, illnesses, and deaths in the workplace. In order to ensure the workers' safety and well-being at the end of every working day, it is morally right to ensure they return home safely. Providing workers with a safe workplace can increase productivity and efficiency, resulting in a decrease in absenteeism. The manufacturing team at this company was provided with three breaks throughout their strenuous work. Because of this, they need a lot of rest in order to be able to focus on completing their tasks. Those working in the office are allowed to have flexible work hours. As a result, they have the option to come to work at 8 a.m., leave at 5 p.m., or to come at 9 a.m. and be back at 6 p.m., as long as they work 8 hours a day. As a result, employees benefit from improved mental health. They have more time to rest on weekends, and work does not consume all their thoughts. Consequently, it could increase productivity among workers. Moreover, the factory shuts down on weekends except for those who work overtime.

In term of environmental aspect, Royal Selangor products are made to last and be passed down from one generation to the next. Each product is carefully planned considering its entire lifespan. Environmental impact is also taken into consideration when planning new products. Royal Selangor's current packaging change is a great example of post-consumer environmental protection. As part of their effort towards zero non-biodegradable content in their packaging, they are implementing a massive design change. Eliminating plastic foam is the obvious environmental advantage but adapting a flat pack box format also helps with reducing transport emissions when they get their boxes from the supplier as they can fit multiple more boxes in a single delivery.

Creating a high-quality product required a high-quality packaging as well. Royal Selangor work with wood to create variety of wood boxes that keep the product protected from any dusts and damages. The company began with a selection of products derived from sustainable forests certified by the Programme for Endorsement of Forest Certification (PEFC), a non-profit, non-governmental organization dedicated to improving sustainable forest management. The organization aims to ensure that timber and other forest products are produced in a manner that adheres to the highest ecological, social, and ethical standards. This will allow customers to identify products that come from sustainably managed forests. Basically, PEFC Chain of Custody Certification ensures that the wood products contained in a product or product line can be traced back to the forest where they were grown. In accordance with the Malaysian Timber Certification Scheme (MTCS), Royal Selangor successfully acquired Chain of Custody Certification. The MTCS is a national timber certification scheme for sustainability developed and operated by the Malaysian Timber Certification Council.

CHAPTER 5

CONCLUSIONS

5.1 Conclusions

Throughout the 24 weeks of industrial training in Royal Selangor, I have acquired a wide range of skills and experiences. The people in the company and the work that I have done in Royal Selangor have provided me with a wide range of opportunities and experiences.

My industrial training has helped me demonstrate acceptable social skills and responsibilities during my industrial training, despite the obstacles I encountered while an intern at Royal Selangor, specifically when I was transferred to the packaging department. Also, I was able to follow professional ethics in completing tasks and projects and demonstrated a commitment to lifelong learning and independent learning. In addition, I have developed good verbal and written communication skills throughout my industrial training course.

To conclude about my experience when working on my projects, these projects have gone through a lot of trial and error processes before being approved by the superiors, introduced to all workers in Royal Selangor and then presented to the customers as the final result. In Royal Selangor, no matter who they are, either the pewtersmith or any workers, everyone takes it very seriously when it comes to the products' presentation in order to gain customers satisfactory. As a person who believes in delivering quality results to people, I made sure that my projects come to everyone's satisfactory and I have to admit that I am very satisfied with the outcome of my projects.

5.2 Suggestions and Recommendations

For the suggestion and recommendation, it is recommended that Royal Selangor hire more workers in the packaging department. In the current state of the department, the decision to keep only one worker is an incorrect one. A person cannot handle the workload of a packaging department by themselves, requiring more than two people to handle it. This is due to the fact that the packaging department is too large for one person to handle. They must consider the mental health of their employees if they want them to stay.

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