The Management Process of Grassroots Innovation that has Potentials for Commercialisation

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. It is original and is the result of my work, unless otherwise indicated or acknowledge as referenced work. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

The research was conducted to create the guidelines on managing grassroots innovation (GI) products for commercialisation. GI could be defined as a process that occurred due to study on problems of existing products and the needs for new innovation. The existence of GI was due to the needs and problems faced by the villagers or the grassroots communities. The process and activities of developing new products are made by the communities. The specific management strategies are needed to utilise the role of each expert in developing GI. The management process of GI is important to equip grassroots communities with important knowledge and skill in creating a good product for commercialisation. Collected data from reading, field observation, interview and questionnaires are compiled to create the best management process of GI. GI products with potential to be commercialised for this research is luffa fiber. The case study on luffa fiber was undertaken for this research. Through the case study, identified product was developed in design and function. The new product developed from the luffa fiber is shower sponge, oven mitt, dishwashing sponge and bottle cleaning brush. Product Design Specification (PDS) for the new develop products for case study is to serve people's needs, aesthetically pleasing and multipurpose. The improved management process of GI was identified from the case study process of GI products. Management strategy in commercialising the GI product started with the process of identifying the potential product. Design development was done to innovate the GI product into new develop product. The manufacturing process of the product is the process of making the end product for commercialisation. The validation of commercialisation strategy on GI product was conducted to identify the best commercialisation strategy. The finding shows that the product that are ready for commercialisation need to apply all the important strategies comprises of 4P's marketing strategy, building brands and registering the

business. The commercialisation strategy of GI products creates a guideline to educate grassroots communities and entrepreneur in bringing the potential GI products into the market.

Keywords: Grassroots innovation, commercialisation, grassroots communities, luffa fiber, Product Design Specification, management strategy, design development.

Proses Pengurusan Inovasi Akar Umbi yang Berpotensi untuk Dikomersialkan

ABSTRAK

Penyelidikan ini bertujuan untuk menghasilkan garis panduan dalam pengurusan inovasi akar umbi yang berpotensi untuk dikomersialkan. Inovasi akar umbi didefinisikan sebagai suatu proses yang terhasil daripada pemerhatian pada permasalahan produk sedia ada dan keperluan untuk menghasilkan inovasi baharu. Kewujudan inovasi akar umbi juga adalah disebabkan keperluan dan masalah yang dihadapi oleh penduduk luar bandar dan komuniti akar umbi. Proses dan aktiviti penghasilan produk baru ini dilakukan oleh komuniti akar umbi. Proses pengurusan yang spesifik diperlukan untuk memanfaatkan peranan setiap pakar dalam penghasilan inovasi akar umbi. Pengurusan inovasi akar umbi adalah penting dalam melengkapkan golongan akar umbi dengan pengetahuan dan kepakaran dalam penghasilan produk akar umbi untuk dikomersialkan. Data yang dikumpul daripada pembacaan, kajian lapangan, temu bual dan borang soal selidik digabungkan bagi menghasilkan proses pengurusan akar umbi yang lebih baik. Inovasi akar umbi yang berpotensi untuk dikomersialkan dalam kajian ini ialah sabut petola. Kajian kes mengenai sabut petola dilaksanakan melalui kajian ini. Melalui kajian kes, produk yang menjadi bahan kajian diberi penambahbaikan dalam aspek reka bentuk dan fungsi. Produk baru yang dihasilkan daripada sabut petola untuk kajian kes adalah span mandian, sarung tangan ketuhar, span cucian dan berus membersihkan botol. Spesifikasi reka bentuk produk untuk produk baru yang dihasilkan adalah untuk memenuhi keperluan semasa, mempunyai reka bentuk yang menarik, dan mempunyai lebih daripada satu fungsi. Pengurusan inovasi akar umbi yang ditambah baik dikenalpasti daripada kajian kes penghasilan produk inovasi akar umbi yang baharu. Strategi pengurusan inovasi akar umbi untuk tujuan komersial dimulakan dengan proses mengenal pasti produk yang berpotensi. Penambahbaikan reka bentuk

dilakukan untuk menginovsikan produk inovasi akar umbi kepada produk barharu yang lebih baik. Proses pembuatan produk akar umbi merupakan proses menghasilkan produk yang siap untuk dijual. Proses validasi untuk strategi komersial produk inovasi akar umbi dilaksanakan bagi mengenal pasti strategi komersial yang terbaik bagi produk inovasi akar umbi. Produk yang siap untuk dikomersialkan haruslah mengaplikasikan strategi pemasaran 4P, diberi penjenamaan dan mempunyai perniagaan yang berdaftar. Strategi komersial produk inovasi akar umbi menjadi panduan untuk memberi pengetahuan bagi golongan akar umbi dan usahawan produk tradisional dalam memperkenalkan produk akar umbi di pasaran.

***Kata Kunci**: Inovasi akar umbi, dikomersialkan, komuniti akar umbi, sabut petola, spesifikasi reka bentuk, strategi pengurusan, penambahbaikan reka bentuk.*

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LIST OF ABBREVIATION

GI	Grassroots innovation
PDS	Product Design Specification
VCO	Virgin coconut oil
UNIMAS	Universiti Malaysia Sarawak
ROB	Registrar of Business
SSM	Suruhanjaya Syarikat Malaysia
SPSS	Statistical Package for the Social Sciences

CHAPTER 1

RESEARCH BACKGROUND

Overview

This chapter provides the background of the study and highlights the interest in the management process of grassroots innovation that had potential for commercialisation**,** the aims and objectives and the guidelines for research approach and structure of the thesis.

1.0 Introduction

The present research is pertaining to the management process of Grassroots Innovation (GI) products that have potential for commercialisation. The aim of this research is to plan the best strategy in managing the GI products done by the grassroots communities. The three main foci of this research include identifying the potential GI products, planning the product enhancement process through new ideas and development, and strategising the most appropriate commercialisation approach for the GI products. At present, only a few of local GI products are developed and delivered into the market. As the innovators are not recognised by the society, they are lacking in common encouragement to nurture confidence, having shortage of medium to incorporate with the formal science and technology equity capital, lack of financial, lack of excellent framework of protecting intellectual property, concern of formal institution and system, and support from the educational system, and all the problems has not been resolved (Hua et al., n.d.). The selection of GI as the subject for this research is due to the high commercial potential of GI products. The reason of no specific guidelines on managing the GI of the grassroots communities makes their knowledge and skills unknown. There are plenty of natural resources within GI that could be utilised and ultimately bring profits in many areas. The study provides guidelines on managing the existing and potential

GI and to enhance GI with the current market needs. The GI products with potentials for commercialisation were identified and used as a case study. Through the case study, the identified products were developed in features and functions to accommodate the market needs. Through this research, the best management process of identifying potential GI, developing the GI products and applying commercialising strategy on GI products are the main targets to be achieved.

1.1 Research Motivation

The research problems that occur through educational, social and economic lead to the outcome for research motivation as stated below:

1.1.1 Educational Potential of Research

The improvement in the management process of GI should be done to inform and educate grassroots communities on how to manage the existing GI products for commercialisation. The knowledge in managing design provides guidelines to every designer and inventors in managing the design process for commercialisation. The present challenge is to bring the potential grassroots innovation into debates about research, indicators, and pathways to sustainability (Smith & Seyfang, 2012). For this reason, the knowledge given through this research could be the bridge for GI inventors to deliver their products into the market. The participation of formal and informal sector could occur if we acknowledge, honour and reward the creative grassroots ideas. The support for grassroots communities by transferring their ideas into products or services through combining modern science and technology, design, and risk capital will represent the heart of GI (Gupta, 2013).

1.1.2 Social Potential of Research

Grassroots innovators should possess knowledge and up-to-date skills on how to produce a good design. This could be done through educative knowledge and specific guidelines on the management process of GI. The guideline provides the grassroots innovators with knowledge on creating good design and the strategy on commercialising their products. The knowledge and ideas from grassroots product inventor need to be utilised to create potential products and invention that fulfill the needs. Innovation is the discovery and development of new ideas and the combination of present knowledge in pursuit of the continuing competitive advantage (Mooi & Filippov, 2010). There is no connection and exchange of ideas for grassroots communities and professional researchers limit the grassroots innovators level of enthusiasm for innovation and indomitable ideas on innovation to solve the difficulties. Their innovative attitude could not meet the scientific research standard and hard to be accepted by scientific community (Hua, et al, n.d.). For this reason, it is essential to equip the grassroots communities with knowledge and skill in managing product design, developing good design and commercialising potential products.

1.1.3 Economic Potential of Research

Grassroots innovators should be equipped with entrepreneurship knowledge as a way to fully utilise their skills. The commercialisation activities could bring the GI product into market to fulfill the needs of people. By introducing the GI products into the market, grassroots communities will gain profits from entrepreneurship activity and could also increase the growth of our country economically. The innovation created by individuals and non-governmental research institute is primarily generated new technologies, new products, and new processes to solve daily problems depending on the needs of people and the country. This innovation is practical to people's needs with wide potential market space (Li et al, n.d.).

1.2 The Needs and Benefits of Research

1.2.1 Knowledge for Innovators or Product Manager

Grassroots innovators are generating valuable ideas through experience dealing with the daily activities. They prefer to come out with new ideas and strategy in developing GI products to solve existing problems. GI exist when the available systems and practices unable to occupy their necessity (Gupta, 2013). GI are self-generated by the craftsman and grassroots communities with crafts and skills. The spontaneous order arise from their own knowledge usually out of order, dissimilar from the stable man-made order and fabrication order (Hua et al., n.d.). The challenge for scientific research institutions or conventional innovators is to learn how to engage with that diversity. Through the knowledge and guideline on managing GI, the knowledge and skills, especially of grassroots communities could be improved.

1.2.2 To Utilise the Existing and Potential GI

Our country has plenty of natural resources that could be developed into potential GI for commercialisation. The GI emerge when the existing problems are fixed through development of products from new materials and practice or existing material and withdraw method for new purpose (Gupta, n.d.). Through the development of the potential GI, the variety of innovative and useful products could be increased. Grassroots communities are the backbone of the future and for this very reason, they need to be exposed with knowledge and ways to move further (Jejak Inovasi Magazine, 2012). Moreover, the well-developed GI products could be the kind of products that fulfill the consumer needs.

1.2.3 Benefits for Country's Economy

Through the cooperation from various parties, we could share our knowledge and learning new skill from the innovators of another country. With the increasing number of

skills, innovators with new ideas in our country, many innovative products will be created and could be commercialised all around the world. Behind every grassroots innovation is the cultural environment of innovation, the root of innovation, the discovery spirit and the enthusiasm for creation (Li et al., n.d.). The impact of this process would be providing substantial economic benefits to the country.

1.3 Objectives of Research

1. To investigate the current management process of GI that have potential for commercialisation.
    - The researcher are identifying the existing management process in managing GI products for commercialisation that usually done by the inventor of GI or the grassroots communities.
2. To identify the commercial potential of selected GI products.
    - The researcher would like to identify the achievement of GI products in the market. Through this process, researcher are investigating the performance of existing GI products on market.
3. To design and develop the commercialisation management process of the selected GI product.
    - The researcher was identifying the design of present commercialisation mangement and developed the new commercialisation management strategy for GI products.
4. To validate the commercialisation process of the selected GI products.
    - The researcher was identifying the effectiveness of the new commercial management strategy for GI products.

1.4 Research Scope

1.4.1 Areas of Study

The research main locations are in inland areas of Kuching, Sarawak (refer to Figure1.1). Early investigation to identify the types of GI around Malaysia are done by browsing through the internet and books. *Yayasan Inovasi Malaysia* (YIM) provides the information on GI products all around Malaysia. YIM proposes is to identify the potential GI products through the *Jejak Inovasi* (Innovation Trail) program. Field study of identifying GI categories was done by visiting museum all around Kuching (Figure 1.2) such as Sarawak Museum, Textile Museum and selected village with GI products. Some of the village areas of conducting field study is Kg Tematu Kota Samarahan (Figure 1.3), Kota Padawan (Figure 1.4) and the village area around Kota Samarahan, Sarawak. The villagers areas were selected due to the availability of grassroots communities with potential GI products for this research. Field study of identifying potential GI products was done by visiting market place where products done by grassroots community were displayed for sale. The location for cass study is Serikin Market, Bau (Figure 1.5) and market around Kuching.

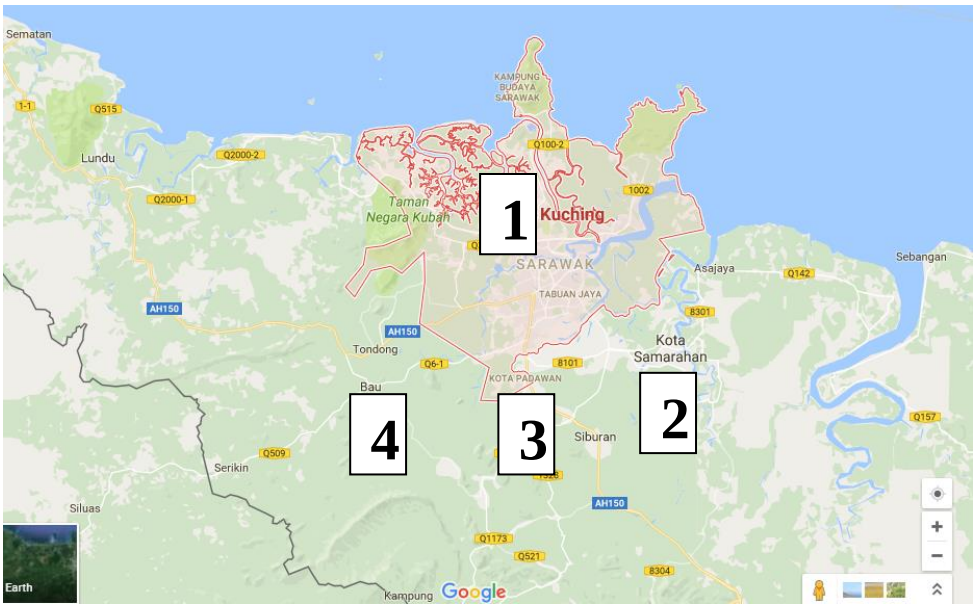


Figure 1.1: Research areas around Kuching, Sarawak map (https://maps.google.com, 2016)

Figure 1.2: Museum around Kuching (http://www.holidaygogogo.com, 2012 & http://mysarawak2.blogspot.my/2010_05_01_archive.html, 2010)

Figure 1.3: Kampung Tematu map (https://maps.google.com, 2016)

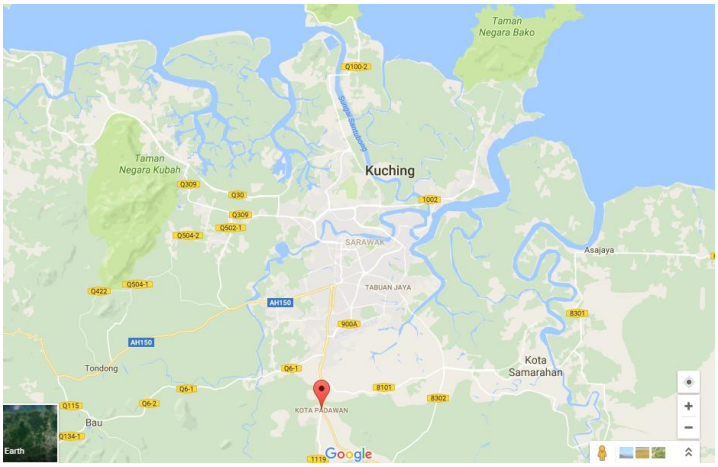


Figure 1.4: Kota Padawan map (https://maps.google.com, 2016)

Figure 1.5: Serikin Market, Bau (https://maps.google.com, 2016)

1.4.2 People Involved in This Study

Design manager, designer, users, marketing expert and grassroots innovator, are the people that were involved in the research study. The selected areas were chosen as the villagers also known as grassroots communities have many GI products with potentials for commercialisation. The villagers are creating different types of products with good idea for innovation. The design manager is the planner for the design process doing the role of identifying the potential GI product to be developed until the end process of commercialising the products. The designer accomplished the process of finding the problems of existing products and discover the solution to create better products. The users are categorised as the people that experienced the use of the products and dealing with the performance of the products. Meanwhile, marketing experts are the people that have knowledge in dealing with commercialisation strategy for marketing the products. The grassroots innovators are usually

the people that deal with the process of design management and design development, the product user and sometimes the marketer of their products too.

1.4.3 Types of Product

The research case study is on GI products with potentials for commercialisation. By conducting the case study, the new GI products of grassroots communities are developed. Through the case study process, researcher is experiencing the management process of GI products, product development process of GI and identifying the commercialisation strategy of the product. Using the case study products, validation process is conducted to create the best commercialisation management strategy of GI products.

1.4.4 Time Frame

The research takes about 45 weeks to be done (Refer to Table 1.1).

Table 1.1: Time frame of conducting research

Process	**Duration**
Existing Product Observation	5 weeks
Data Analysis of Existing Product	5 weeks
Interview	5 weeks
Questionnaires Distribution	5 weeks
Data Analysis	4 weeks
Existing Product Design Development	4 weeks
Commercialisation Management Planning	4 weeks
Commercialisation Management Finalisation Process	4 weeks
Thesis Writing	8 weeks

1.5 Conceptual Framework

In general, the research focuses on the study of GI product commercialisation (refer to Figure 1.6). The study of GI for this research divided into two main categories of management process and product innovation strategy. The management strategy acknowledge the needs, innovation processes, promotion and the process of consulting and training. Meanwhile, the product innovation strategy that conduct through case study considering the aspect of aesthetic styling, safety, localise and semi-mechanised characteristic of GI products. The needs in management process involved the user, the participation of GI product inventor to innovate, involvement of organisation for the promotion and consult and training process that involved the professional. On the other hand, in innovation strategy process, aesthetic styling acknowledge the design, safety will take into account the ergonomic characterstic, localise consider the material and semi- mechanised acknowledge the manufacturing process. The main focus involve in the overall management process of GI product commercialisation are grassroots communities and expert. For innovation strategy of GI product commercialisation, the main focus that needs to be acknowledged are art and creativity and technology used.

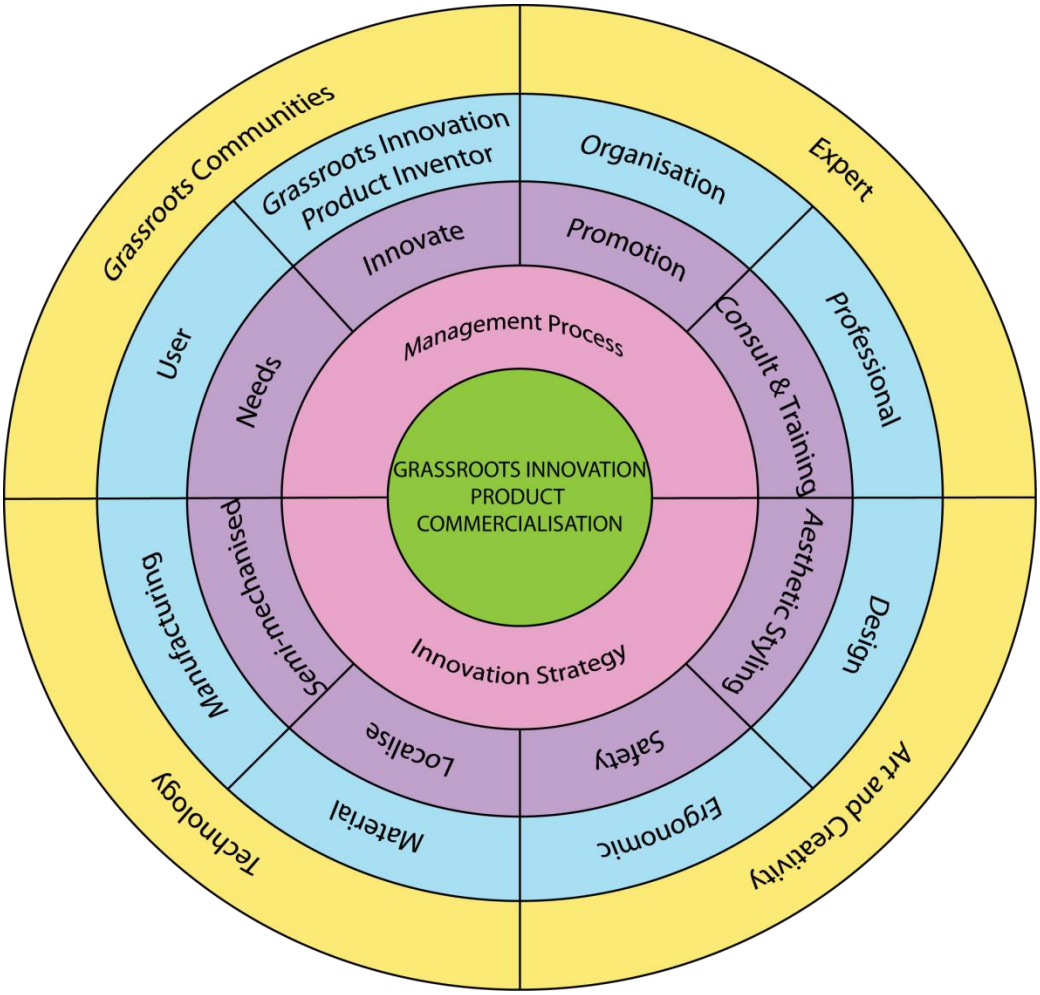


Figure 1.6: Conceptual Framework for the entire research

1.6 Research Outline

The research consists of six chapters as follows

Chapter 1: Research Background

Chapter 2: Literature Review

Chapter 3: Research Methodology

Chapter 4: Data Collection Output

Chapter 5: Case Study and Strategising The Commercialisation Process

Chapter 6: Conclusion

The thesis is structured for the purpose of fulfilling the outcomes of identifying the potential GI, planning the management strategy of GI, conducting the case study on potential GI and identifying the commercial strategy to deliver the products into the market.

CHAPTER 2

LITERATURE REVIEW

Overview

This chapter outlines the relevant literature pivotal to the foundation of this study. It provides the definition of GI, the example of the International and Local GI, the entrepreneurial potential of GI in Malaysia, the international and local organisation that involved in the development of GI and information on management process, commercialisation strategy and innovative product development.

2.0 Introduction

Malaysia is a country with multiracial and multi religious population. The diversity of the people in Malaysia had brought to creations of many traditional products and services. Although Malaysian are facing the development and modernisation, the traditional culture of Malaysian and product with Malaysian identity were still applicable until today. The riches of this tradition are good to maintain and improve through existing technologies and development.

2.1 Definitions of Grassroots Innovation (GI)

The difficulty and demand of using locally available resources are the major drivers of innovative technology development. Grassroots community known as the foundation of the community comprises of the children, youth, woman, non-government organisation, rural communities and underprivileged people (Jejak Inovasi Magazine, 2012). The term "grassroots" consigns to the masses that are consisted of villagers and rural folks (Yayasan Inovasi Malaysia/Malaysian Foundation for Innovation, n.d.). It is believed that there is a lot

of valuable innovation at this stage if been utilised and properly nurtured. The rapid growth of innovation might occur through the grassroots communities and for the grassroots communities (Yayasan Inovasi Malaysia, n.d.).

Grassroots Innovation (GI) is defined as the innovation done by grassroots people who have techniques and skills in improving products, techniques and crafts with their own way (Hua et al., n.d.). Hua et al. also states that in terms of subject, GI is the earlier innovation starting from the grassroots, in terms of motive it is a kind of directness ideas, in terms of methods, GI comes from direct experience and in terms of type, GI is the lowest cost of innovation based on the technology used. GI is not design to accomplish the leading-edge technology, nor a technology-oriented innovation but to focus on the function and economic innovation (Hua, et al., n.d.). GI includes the progress and links of academic, activists and practitioners. Practitioners are people who analyse every kind of knowledge formation to innovate (Fressoli et al, n.d.). Grassroots innovation occurs through accidentally, research, trial & error or managing solution in new ways when the existing product could not satisfy the human's need (Gupta, 2013). Science, Technology and Innovation are the main aspect to be concerned about as it raise the economy of high income countries (Madinah Mohamad, 2012). The entrepreneurial process of GI may be guided by people or access to resources without any influence of social and ethical on the opportunity to make an investment of the existing resources (Gupta, 2013). Gupta suggests 7 creative ways to foster GI as stated below:

1. Encourage growth of micro-venture finance
2. Expand the innovations by providing incentives to innovators
3. Recognise, respect and reward innovators where they live
4. Create community fabrication workshops in the innovators home
5. Build partnerships between formal and informal science

6. Invest in children's ideas as part of the innovation inverted model

7. Mobilise university students to address unsolved social problems

The sharing of ideas and knowledge among individuals and knowledge providers could bring benefits to both parties. The applications of ideas from grassroots communities and contributions to their knowledge would bring income through the commercialisation process of the products. This indirectly helps the rural community to improve their lives by increased their output on the enhancement and commercialisation of their inventions (Innovation Walk, n.d.). Futher definition of GI is listed on Appendix 1.

2.2 Example of International and Local GI Products and Services

There are several GI to be developed in international and local level identified through the research and activities done by the organisation involved in the development of GI. For example, Figure 2.1 shows the Load Carrier for Labourer inspire by the people in India. The Load Carrier for Labourer categorised as daily use GI product made from rattan and has a multipurpose use.

I II III

Figure 2.1: Load Carrier for Labourer (http://trak.in/tags/business/2011/08/03/innovative-product-design-load-carrier-labourers/, 2015)

I. *A push cart as well as a backpack, which can pick-up heavy loads*

II. *To carry Loads overhead with ease*

III. A pushcart

The potential grassroots products for innovation have been listed out on the National Grassroots Innovation Databank done by the YIM. The example of existing GI product made by the grassroots people around Malaysia were *Bambangan* Ice Cream, Cleaning Glove, Dead Body Protector, Electronic Egg Cleaner, Flash Drive with the Wireless Ability in Transfering File (Flash-X) and etc. *Bambangan* is a kind of local fruit that usually eaten raw or ripe. Dead body protector are invent due to the problem occur during an accident, where the inventor finds out no suitable product to cover the body of the dead body of an accident victim.

Figure 2.2: *Bambangan* Ice Cream - made from a fruit known as *Bambangan* in Sabah local language (YIM National Grassroot Innovation Databank, n.d.)

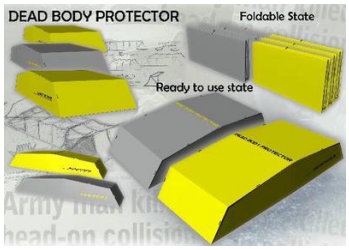


Figure 2.3: Dead Body Protector – for covering the dead body in accident cases (YIM National Grassroot Innovation Databank, n.d.)

The products stated above are example of GI product that had been develope by grassroots communities in Malaysia but does not enter the market yet.

2.3 Internationals and Local Organisations Involved in the Development of GI

There are several international and local organisations involved in the development of Grassroots Innovation. The international initiatives under GI Movements include the Appropriate Technology Movement (1970's), the People's Science Movement, India (1980's), the Honey Bee Network in India and the Technologies for Social Inclusion Movement in Latin America. The GI Movements are formed to seek the processes of innovation. They focus on the knowledge, processes & outcomes produce by local communities. People and organisations involved in Grassroots Innovation movement are the professional including engineers and designers that make the local knowledge and activities as the leader of the collaborative innovation activity (Smith et al., 2013).

To support the work of the Honey Bee Network, they had form a number of organisations: Society for Research and Initiatives for Technologies and Institution (SRISTI) established in 1983, the Grassroots Innovation Argumentation Network (GIAN) established in 1997, National Innovation Foundation (NIF) set up in 2000 with the initiative of the Indian Ministry of Finances autonomous under Department of Science and Technology. The Honey Bee Network has reached out more than 75 countries with China as the most influence country outside India follow by Malaysia (Gupta, 2013). The Honey Bee Network is an organisation that finds out the innovation development by grassroots people and educate the potential people to utilise the innovations to improve their living.

The Creative Problem Solving Group, Inc. (CPSB) is an international services firm located in Erie Country and New York State. CPSB have been involved in the field of creativity and innovation for more than 20 years with the aim of giving knowledge to unleash the full spectrum of creative talent in organising. They serve their associates through

providing programs, workshops, courses, and consultation. CPSB also providing a network of seasoned scholars and researchers to guide their research and development work.

Two government agencies were established to initiates the innovation activities in Malaysia known as *Agensi Inovasi Malaysia* (AIM, Malaysian Innovation Agency) and *Yayasan Inovasi Malaysia* (YIM, Malaysian Innovation Foundation) (Mohd Faiz, 2012). The AIM was establish to evolve the innovation eco-system in Malaysia. *Yayasan Inovasi Malaysia* (YIM) or the Malaysian Foundation for Innovation is a local organisation established in 2008. YIM had initiated The National Grassroots Innovation Databank Project. The establishment of YIM was supported by Ministry of Science, Technology and Innovation aim to educate Malaysian on creativity and innovation. *Jejak Inovasi* (Innovation Walk) is an initiative made by the Yayasan Inovasi Malaysia (YIM) and the Ministry of Science, Technology and Innovation (MOSTI) to visit the grassroots communities and giving them consultations on objectives and the desired end-results of innovations. State of Melaka (15-17 July 2011) was the first innovation venue for Jejak Inovasi involving the participation of "Innovation Scouts" which consist of researchers, scientists, patent experts, MOSTI officials and YIM. Through this programme, potential innovations will be developed via both private and public institutions such as MOSTI's Innospace Centers located in various parts of Malaysia.

2.4 Entrepreneur Potential of GI in Malaysia

As a way to promote the GI, the courage of venturing and take failure positively need to occur in the entrepreneurship culture and innovation process. The innovative skill of the ordinary people needs to be polished and utilise as the exploring spirit and enthusiasm for creation are the compulsion in every innovation (Hua, L. et al, n.d.).

2.5 Potential GI Products and Services to be Developed

An early investigation or field study has been done to identify the potential type of GI products. The type of products that has been shortlisted as the case study products for this research are multipurpose products made from woods, products made from coconut shell, products made from bamboo and luffa sponge. The product that has been identified as a potential commercial product is luffa or *petola* fiber. Luffa had been chosen as the subject for the case study as luffa sponge has not been fully develop into more innovative product by local community.

2.6 Management Process

The focus of this research is to create the management process for GI. GI communities need to be educate with knowledge in managing their skill to bring benefits in potential areas. If anyone is potentially as creative as everyone else, the only things that needs to be done is to educate and prepare them to deliver their potential (Torr, 2008). Succesful of innovation process are measure by the effective controlling and alignment with the project management (Dos Santos et al, as cited in Filippov & Mooi, 2010). The guidelines on GI management would create a better way to nurture the development of GI. Project management is the engine to enforce new ideas and all projects involve certain level of innovation and creative effort, based on the definition of innovation (Filippov & Mooi, 2010). Gupta (n.d.) come out with six reasons important to document GI and Traditional Knowledge through his Honey Bee network outreach as stated below:

1) To learn from creative people
2) To encourage not only lateral learning but also knowledge networking among creative people

3) To empower local communities and individual innovators

4) To link modern science and traditional knowledge

5) To create a culture of innovations

6) To help policy makers in taking the process of scouting and documentation

Proper management process in managing GI could leads to the successful development of GI product and giving proper knowledge for GI communities in facing the real world challenges to create product with competitive advantages.

2.7 Commercialisation Strategy

Commercialisation strategy play an important role to deliver GI products into market. Creative idea is transformed from invention to innovation through the commercialisation process on specific market (Filippov, Mooi, 2010). Through proper commercialisation strategy, GI communities could discover to the opportunities to commercialise their skill and products. Knowledge in commercialisation strategy broaden their knowledge in discovering the market demand on creating a good products. A well-developed marketing accomplishment includes anticipatory consideration of the customer in the development process; it assist to guide technical specifications, discover appropriate market segments, determine cost targets to achieve pricing objectives and recognise partners that will play an important role in the value delivery process (Zemlickiene & Maditinos, 2012). The essential considerations in developing a commercialisation strategies are vision, business philosophies and a logical assessment of market opportunities. Focus are needed for these three aspect of a marketing strategy that are product differentiation, competitor orientation and brand profiling emphasis (Zemlickiene & Maditinos, 2012).

2.8 Innovative Product Development

Design process is important in creating products that could meet the market needs. A strong foundation for flourishing product development comes from the input given by customers and markets (Munksgaard & Freytag, as cited in Zemlickiene & Maditinos, 2012). The valuable ideas and skills from GI inventors are important, but the proper design process in innovative product development become the priority to utilise their creativity. The exploration and exploitation of new ideas and the combination of existing knowledge to pursue sustained competitive advantages known as innovation (Fillipov & Mooi, 2010). The innovation done by local individual or groups might not be the best as they needed the recombination of formal science with informal science to add value for the knowledge, innovations and practices (Gupta, n.d.). To create good design, design process in innovative products development should be make into practice by the GI communities.

CHAPTER 3

RESEARCH METHODOLOGY

Overview

This chapter provides the description of the selected methodology applied in conducting this research**,** the detailing of the applied methodology phases and the approach taken in reviewing the related literatures.

3.0 Introduction

Research methodology creates guideline to carry out research. This research employed a mixed-method approach. The data are collected through quantitative and qualitative process. The data collection process for the research are divided into two different parts, primary data and secondary data. Research methodology discusses the step by step approach to conduct research until the end process of writing the full thesis. The overall research process is conducted as follows.

3.1 Research Methodology Flow Chart

(Refer to Figure 2.1: Research Methodology Flow Chart)

3.1.1 Explanation of Flow Chart

The research background gives an explanation on the title of research and the research proposal for the overall research. The research process is divided into four different stages of stage 1, stage 2, stage 3 and stage 4.

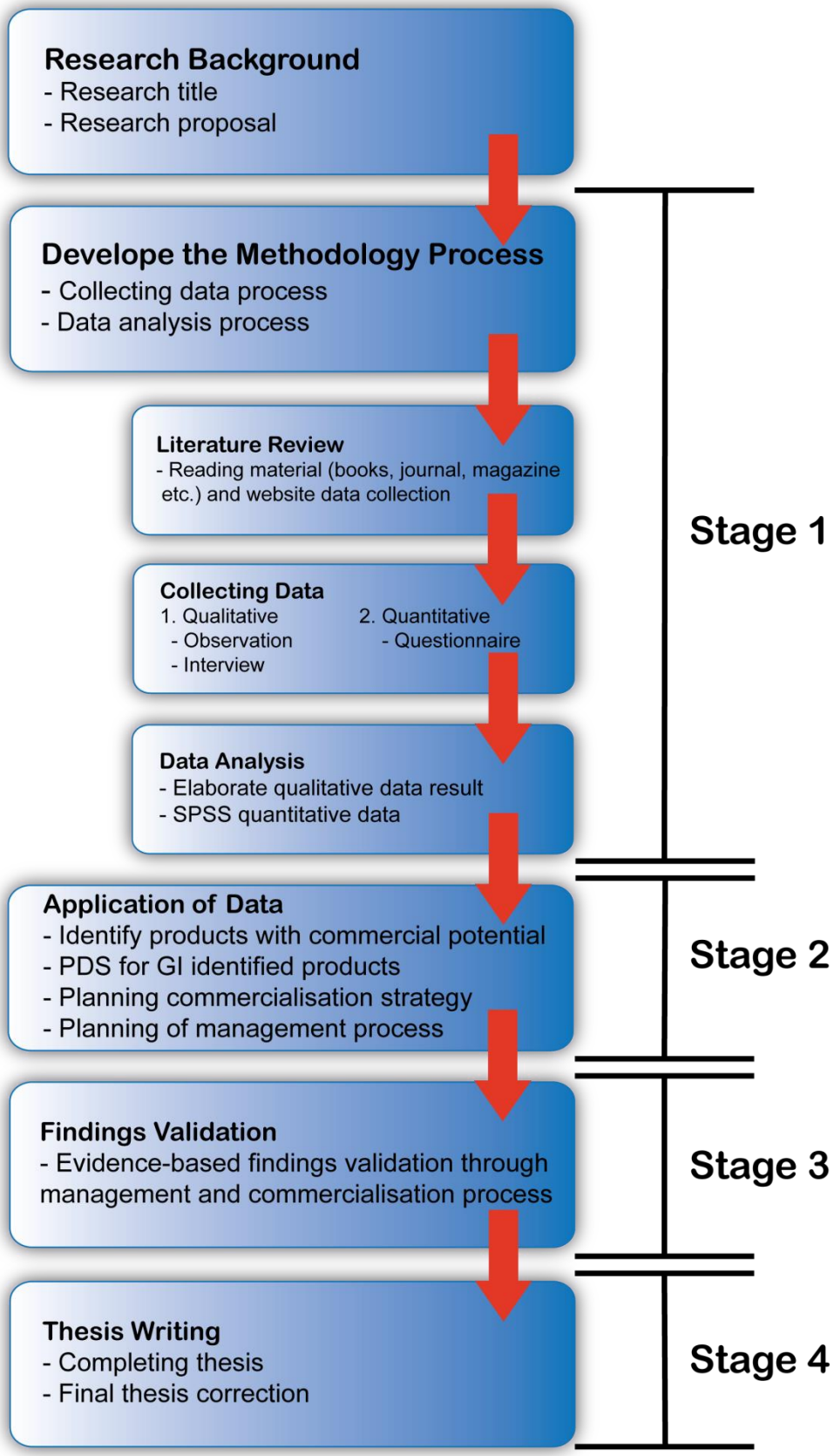


Figure 3.1: Research Methodology flow chart

Stage 1 is the stage of planning the research process and collecting data for the entire research. Stage 1 comprised of developing the methodology process, writing the literature review, planning the collecting data process and data analysis process. The research methodology phase covers the process of identifying the data for literature review, collecting data to accomplish the objectives of research and data analysis process. References in the literature review were collected on reading materials such as books, journals, magazines and references from website for example the web page and blog. The collecting data process consists of the process of finding the qualitative and quantitative data. The phase of data analysis is divided into two different categories. The qualitative data will be analysed through elaboration of data and quantitative data will be analysed with SPSS Data Editor.

Table 3.1: Qualitative and quantitative data for data collection process

Qualitative Data	**Quantitative Data**
Reading	Questionnaire on Information about GI
Observation	
Conducting Case Study	
Interview on Information about GI	
Interview on Commercialisation Strategy of GI Product for Case Study	
Interview on Validation of Management Process of GI that have potential for Commercialisation	

Stage 2 is the phase of application of the collected data that involved the process of specify the GI products with potential for commercialisation, determine the product design specification (PDS) of new GI product for case study, strategising the best commercialisation strategy, and define the management process of GI.

Stage 3 is the phase of doing validation on the new improve products. The stage will discover the success of the findings on the management and commercialisation strategy of GI. Collected result from analysed data will be verified for the validation process.

Stage 4 is the last phase of the overall research. On this phase, the researcher is dealing with the writing process for the thesis. Correction and improvement of the research are done before the submission of the final thesis.

3.2 Data Collection Process

Primary Data are categorised as data collected from field observation, questionnaire distribution and conducting interviews. Secondary Data are collected from reading material such as books, and collected references from journals and websites.

3.2.1 Reading

The reading process was done to gather information and generate idea for research approach. Reading references were cited from reading material such as published books, journals, magazines and internet sources of website and blog. Direct reading from the books and journals focusing on obtaining information on the management process of existing GI products, the commercialisation process of innovative product and type of grassroots innovation products. Website and blogs may also contain important information regarding the study.

3.2.2 Observations

Observations were conducted to collect information on the management process of existing GI products and the potential GI product for commercialisation. The best locations to conduct this observation are village and rural areas where the traditional inventions are used

widely to carry out daily tasks. Besides that, the observation was done in the housing area around Kuching where the people are still using traditional product to do daily activities. To collect more detailed information, the researcher examines the method of using and identify the function of the existing GI.

Table 3.2: Timeframe for conducting the observation process

Duration / Task	Week 1	Week 2	Week 3	Week 4
1. Identifying potential areas				
2. Identified the GI products in market place				
3. Identifying the types of GI products and classified them into different categories				
4. Identifying the innovator of the GI products and the process of making the GI products				
5. Collecting data through interview, photos taking, and written to be include in research				

3.2.3 Questionnaire on Information about GI

Questionnaire for this research were distributed to the respondents that dealing with GI. They are the inventor or user of the existing GI products. The total number of seven product innovator were participated as respondents for the questionnaires. The questionnaires has been validated by the expert before the distribution process. The questionnaire on information about GI focuses on achieving the following approaches:

a) Management process of GI

- To identify the appropriate and well planned process in managing the process of GI

b) Grassroots innovation product analysis

- To identify the grassroots product with high potential for commercialisation
- To analyse customer needs in product invention and to improve the existing GI products

c) The commercialisation process of grassroots innovation

- To identify the best strategy on how to commercialise the GI products

The questionnaire on information about GI product started with the brief explanation on GI to generate respondent ideas about the subject of this research. The questionnaire introduction explains the meaning of the terms GI. The example of existing GI product is attached to expand the understanding of respondent. The questionnaire is divided into four different parts with the significant as stated below:

Part A: Respondent's Background

- To identify respondent's involvement and experience in dealing with GI. The question aims to measure the respondent experience involving with GI

Part B: Understanding on GI

- To identify respondent's knowledge and opinion on existing GI products. The questions aim to identify the respondent information on GI

Part C: Respondent's Opinion

- To identify respondent's opinion on the development of existing GI. The questions aim to gather the respondent's view on existing GI

Part D: The Importance of Processes that Need to be Considered in the Context of Managing GI

- The question's purpose was to identify the respondents view on the processes that need to be highlighted in developing the GI

3.2.4 Interview on Information about GI

Interview session was conducted directly between researcher and respondent. The interview process is important as respondent could come out with unlimited idea and knowledge regarding the research. Through interviews, respondent's answers are not limited to certain areas of study. The interview method is also done to reach out grassroots community with the disability in reading and writing.

In the interview on information about GI, similar questions on questionnaires sheet were used for an interview session. The questions for interview on information about GI are as stated below, with the following approach:

1. The purpose of creating the Grassroots Innovation (GI) products
    - To identify the main purpose of inventing the GI products
2. Does the GI products has high demand for commercialisation
    - To investigate the commercialisation potential of GI products
3. Does the existing GI products need to be improved
    - To analyse the refinement that needs to be done on existing GI products
4. What are the processes involved in developing the GI products
    - To determine the process involved in the development of GI products
5. What is the most important process that needs to be considered before the commercialisation of the products

- To identify the crucial process that needs to be taken into account before the product could enter the market

6. What are the problems that occur in managing the GI products for commercialisation

- To investigate the problem that exists during the management process of GI products

3.2.5 Conducting Case Study

A case study was done to develop the potential GI product for commercialisation. The potential GI products for commercialisation had been identified through data collected from observation of potential GI product for commercialisation. Observation and reading are done to identify the best management strategy to develop the GI products for commercialisation. Further explanation of Case Study will be discussed on Chapter Four of Data Collection Output and Chapter Five on Case Study and Strategising the commercialisation process.

3.2.6 Interview on Commercialisation Strategy of GI Product for Case Study

New GI products developed through the case study were used to conduct interviews with expert regarding the commercialisation strategy of GI product. Questions for the interview focused on the commercialisation strategies used to commercialise the new GI products.

The questionnaire starts with a brief information about GI. The introduction part of the questionnaire explained the identified products for case study and the developed products from case study. The targeted questions on commercialisation strategy of GI products from the expert point of view are as stated below.

1. To determine the appropriate marketing strategy for the new GI products.
2. To identify how to introduce the new GI product into the market or the market entry strategy that consists of the target market and pricing strategy.

3. To determine the ways to verify the competitive advantages of the products

4. To identify the knowledge required to formulate the commercialisation plans

3.2.7 Interview on Validation of Management Process of GI that has Potentials for Commercialisation

The interview is conducted to gain knowledge and opinion regarding the commercialisation strategies of GI products. GI inventor and GI entrepreneur are the people that involved with the interview. When conducting this interview, the researcher giving suggestion on proper strategies for commercialising their GI products to gain further feedback for each suggestion.

The introduction for the interview was on brief explanation of new developed GI product from case study. The questions for the interview are stated as below:

Part A: Questions based on case study

1. To identify the commercialisation potential of new develops products from GI
2. To identify respondent's opinion regarding their acceptance on the new developed GI products compared to the undeveloped existing GI products
3. To identify the respondent's interest in marketing the new developed GI products

Part B: Questions based on the new commercialisation strategy of GI

1. To identify the application of 4P's (product, place, price, promotion) marketing strategy in their business
2. To determine their knowledge in the importance of building brands for the products
3. To identify their approach in planning to register their business
4. To determine their approval on suggestion to patent their invention for further commercialisation strategies

3.3 Data Collection Approach

3.3.1 Observation

Observation process is conducted during the stage of identifying the potential GI product for case study. The GI products that have potential for commercialisation are considered to be the product for case study. Field observation is done in the village area and potential places all around Kuching where GI products are on sale.

3.3.2 Questionnaire Design

A questionnaire has been designed to gain information on Management Process of existing GI (Appendix 8). Questionnaire has been distributed to GI craftsman, design students and GI users. The questionnaires were distributed to collect data and respondents view on GI. The questionnaires were divided into four different parts of Part A, B, C and D. Part A questioned respondent's background to identify their experience in using GI.

Part B is the questions about respondent's understanding on GI. Part B questions are divided as follows

1. To identify the respondent's view regarding GI to solve the problems faced by people.
2. To identify respondent's understanding on the use of technology in the process of making the GI products.
3. To identify respondent's understanding of the invention of GI by grassroots community has a potential to be commercialised.

Part C of the research is to identify respondent's opinion about GI. The questions are stated as follows

1. To identify whether the improvement is needed on the existing GI products
2. To identify whether GI products need to be updated with technologies.

3. To identify whether GI products need to be multi functional or multipurpose.
4. To identify whether GI product need to be aesthetically pleasing
5. To identify whether the participation of professional and expert (eg: designer, engineer and entrepreneur) in the development of GI to give extra knowledge and enhancement of value added features.
6. To identify whether training, workshop and activities done by organisations are needed to help the grassroots communities.

Part D is the questions on importance of processes that need to be considered in the context of managing GI as follows

1. To identify the importance of comprehensive fundamental research to innovate GI products.
2. To identify the importance of identifying the others needs of the existing product.
3. To identify the importance of identifying the needs of new GI products
4. To identify the importance of designing the new GI products.
5. To identify the importance of developing and improving the prototype of new GI products.
6. To identify the importance of the manufacturing process of GI product.
7. To identify the importance of validation or testing process of GI product
8. To identify the importance of commercialisastion study of GI.

The questionnaire on GI are done in two different language of English (Appendix 8) and Bahasa Melayu (Appendix 9) as some of the respondent are more fluent in using Bahasa Melayu language.

3.3.3 Interview

Interviews are conducted through face-to-face discussion. The researcher has conducted three parts of interview. The first part of interview is on the information on GI

product to identify the respondent view and knowledge on the existing GI products (Appendix 10). Interview on the information about GI involve the sets of questions similar to the questionnaire. The second part of interview for this research was the Questions on Commercialisation Strategy of Grassroots Innovation (Appendix 11). The questions comprise of the questions as follow

1. To identify the appropriate marketing strategy for the new GI products
2. To identify how to introduce the new GI product into the market or also known as the market entry strategy, that cover the target market and pricing strategy.
3. To identify the fulfilment of the product for the needs and competitive advantages of the products.
4. To identify the knowledge required to formulate the commercialisation plans.

The third part of the interview is on the Validation of Management Process of Grassroots Innovation that have Potential for Commercialisation (Appendix 12). The question for the interview are stated as below

Questions based on case study

1. To identify the commercialisation potential of new develops products from GI
2. To identify respondent's opinion regarding their acceptance of new develops GI product compare to the existing GI products
3. To identify the respondent's interest in marketing the new developed GI products

Questions based on the new commercialisation strategy of GI

1. To identify the application of 4P's (product, place, price, promotion) marketing strategy in their business
2. To identify their knowledge in the importance of building brands for the products
3. To identify their approach in planning to register their business

4. To identify their acceptance of suggestion of further commercialisation strategies of patent the invention and planning for bigger production.

3.3.4 Case Study

The researcher was doing the early investigation to identify the suitable GI that had a potential for commercialisation. Early investigation done by researcher will be focusing on dividing the GI into smaller categories. Through this process, the type of GI products will be easily identified. For each categories, researcher will identify the list of products that had the potential for commercialisation. A type of GI products will be chosen as the GI products for case study.

3.4 Data Analysis Process

Collected data from reading are written on Chapter Two of Literature Review. The findings from quantitative data are recorded into SPSS Data Editor for analysing process. After the analysis data process was done, the result of findings were interpreted into Pie Chart using SPSS Output Navigator. The findings for the qualitative data are interpreted into text discussion. All the data collected from the interview were interpreted into written data. Interview data were generate and analysed to be applied as research output. Further explanation of data analysis will be discussed on Chapter Four of Data Analysis Output.

3.5 Summary

The methodology process for the research focusing on fulfilling the objectives of this research. The research requires the researcher to experience field study to identify the potential GI. The research method for collecting data on non-experimental process of survey research include the questionnaire distribution and interviews. Reading material becomes the

source of information to plan the research strategy and to strengthen the data. The case study approach help researcher in dealing with the development process of GI products. The questionnaire for the research was the questionnaire on information about GI. Interview questions for the overall research are divided into three different approached. The interviews are on Information about GI, Commercialisation Strategy of GI Product for Case Study and Validation on Mangement Process of GI that had Potential for Commercialisation. The data analysis process will determine the result from data collection. Each type of data collection is important in achieving the objectives of this research. Each answer from the questionnaire will become the important parts of the research.

CHAPTER 4

DATA COLLECTION OUTPUT

Overview

This chapter provides the type of data collection process for this research**,** the process of data analysis used in this research and the output of data collected from references, interview and questionnaires and the information of luffa fiber as the product for case study.

4.0 Introduction

The data collection process focused on accomplishing the research focus of this research. The data collection process involved in this research was done through observation, distribution of questionnaire, conducting interviews and conducting case study. The data collection output evaluates the data collected through the data analysis process. Data collection output discusses further information achieve from the data analysis process.

4.1 Data Analysis

The data analysis process is important to interpret the results from collecting data. Through the data analysis process, conclusion was drawn to answer the research questions.

4.1.1 SPSS Data Editor

The collected data from questionnaire were analysed with the help of SPSS (Statistical Package for the Social Sciences). The data collected has been interpreted in the form of pie charts.

There are the number of seven respondents involved in the questionnaires on information of GI. All of the respondents were dealing in the GI such as craftsman, design

students and the design practitioner. They were also selected as they had experienced the use of GI products. The data collected from the questionnaire on GI are interpreted as follows.

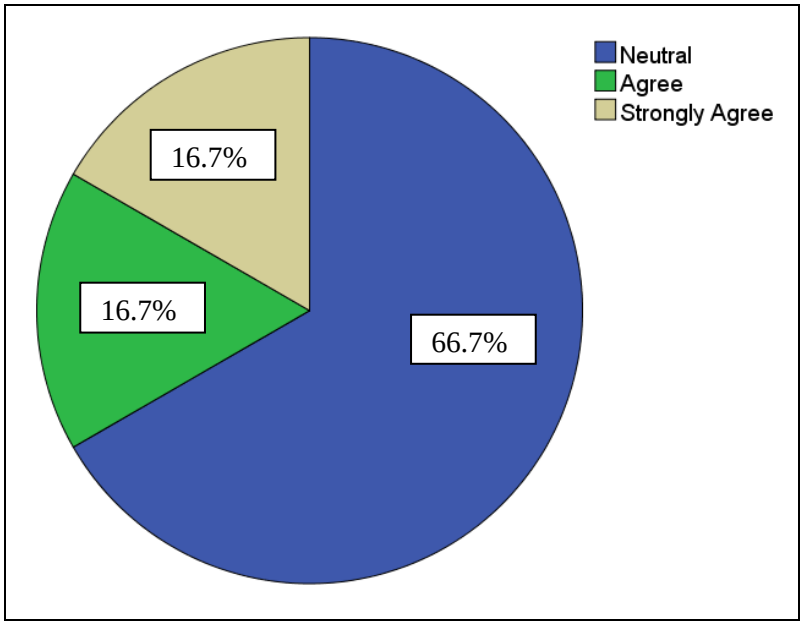


Figure 4.1: Pie chart on GI are invented to solve problems

66.7 percent of the respondents indicated neutral opinion and the remaining respondent answered agree and strongly agree for the purpose of a GI invention to solve problems. The result proved that the idea of inventing the GI products are not due to solve existing problems. According to Kosim Miardi and Tasiana and (Appendix 13), GI are invented to serve people's needs. As stated by Nur Ain Atikah bt Mohd Razaludin (Appendix 13), the purpose of creating GI products are due to reuse and gain benefits of the used items.

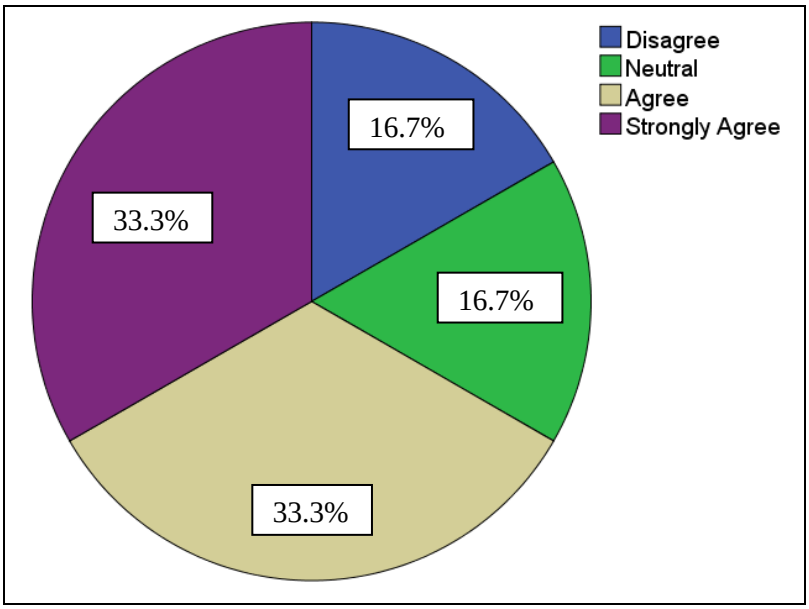


Figure 4.2: Pie chart on use of technology in the making of GI products

A total of 33.3 percent of respondents answered agree and 33.3 percent strongly agree on the important use of technology in the process of making GI products. The result showed that user of GI product needs technology such as machine to produce their GI products. As stated by Kiosim Miardi (Appendix 13), a suitable machine is needed to make GI products to ease the process of product making and create more aesthetically pleasing product appearance.

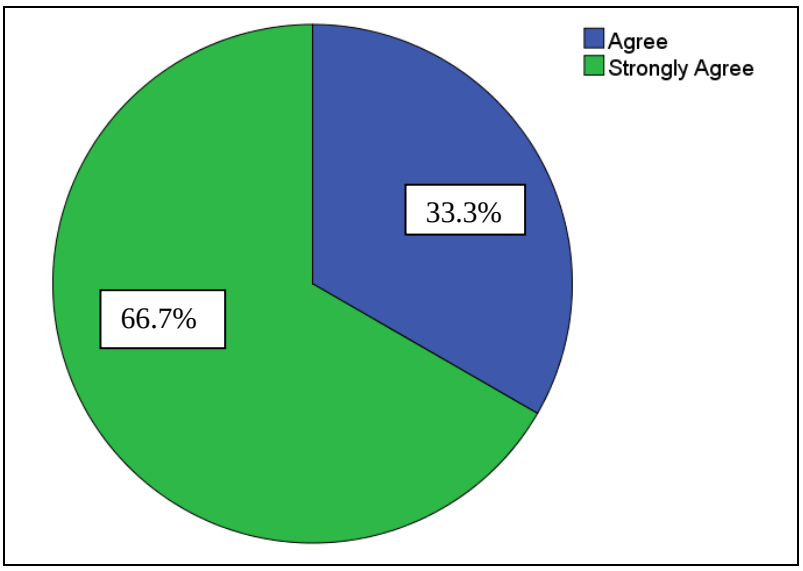


Figure 4.3: Pie chart on GI has a potential to be commercialised

66.7 percent answered strongly agree and the total of 33.3 percent answered agree on the GI potential to be commercialised. The result proved that GI products are potentially commercial and consider as acceptable by consumers. According to Nur Ain Atikah, (Appendix 13) GI has a lot of potential to be commercialised due to the uniqueness and the limitation of the product.

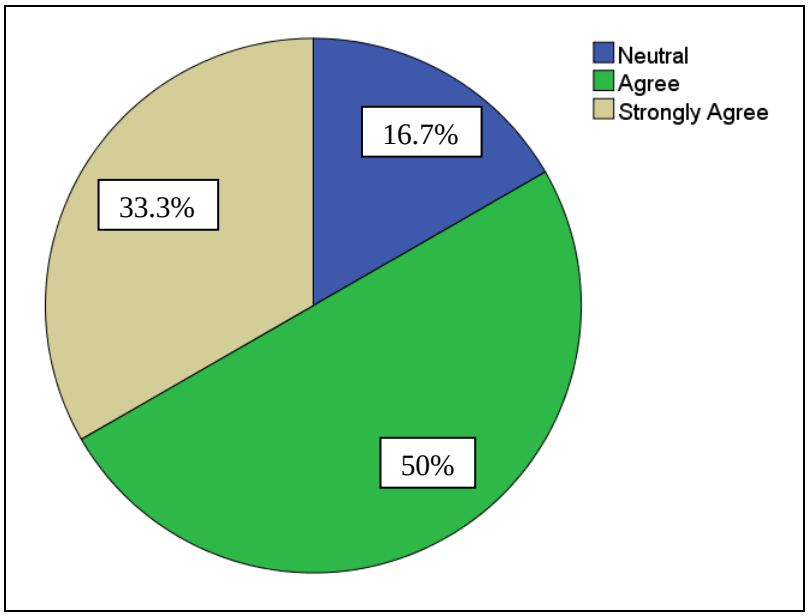


Figure 4.4: Pie chart on improvement on existing GI

50 percent of respondents answered agree and 33.3 percent answered strongly agree for the improvement on the existing GI products. The result shows that the existing GI product may not perform to the requirement of consumer.

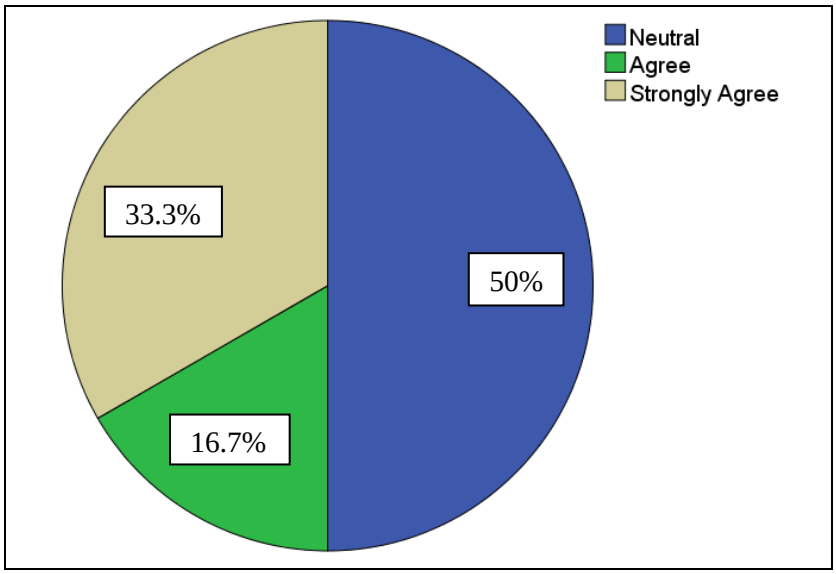


Figure 4.5: Pie chart on GI products updated with technologies

50 percent of respondents answered neutral and 33.3 percent answered strongly agree on GI products need to be updated with technologies. Technologies may not necessarily applied in designing the GI products. This is due the user prefer simple product without the needs of technology added in GI products.

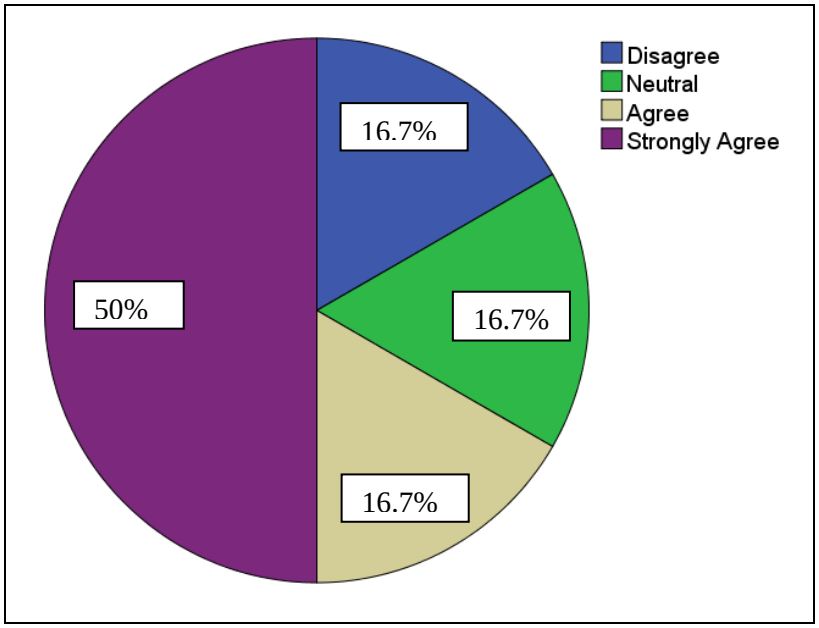


Figure 4.6: Pie chart on GI multifunctional / multipurpose

50 percent answered strongly agree and 16.7 percent each answered disagree, neutral and agree for the GI product to be multifunction or multipurpose. The result showed that GI user prefers GI product with multiple function.

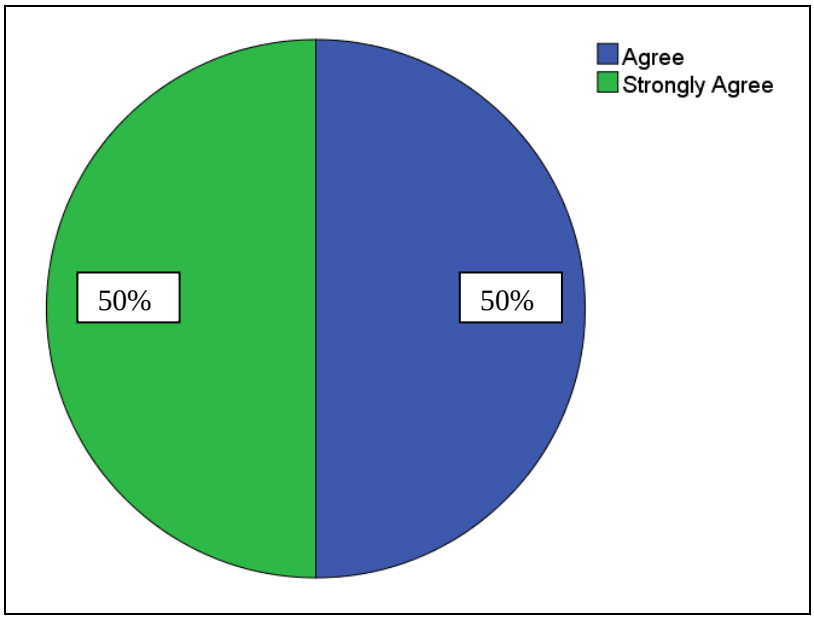


Figure 4.7: Pie chart on GI aesthetically pleasing

The equal percentage of 50 percent each answered strongly agree and agree for the GI product to be aesthetically pleasing. Consumer prefer products that are not necessarily aesthetically pleasing. According to Kosim Miardi (Appendix 13) the products need to be in good quality with proper design and accurate measurement.

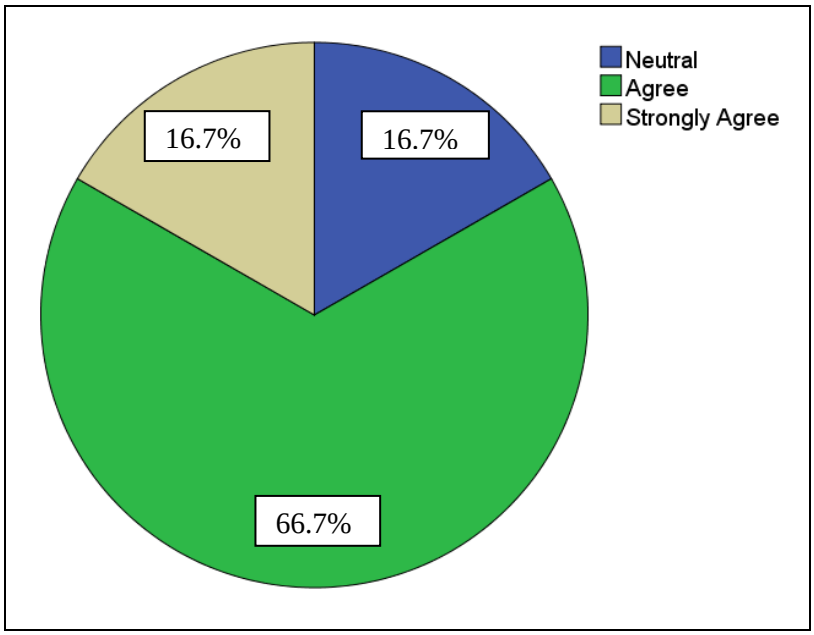


Figure 4.8: Pie chart on participation of professional and expert

66.7 percent of respondents answered agree with the participation of professional and expert in the development of GI product. The result proved that knowledge from professional and expert are important to create good design and best commercialisation strategy for GI product.

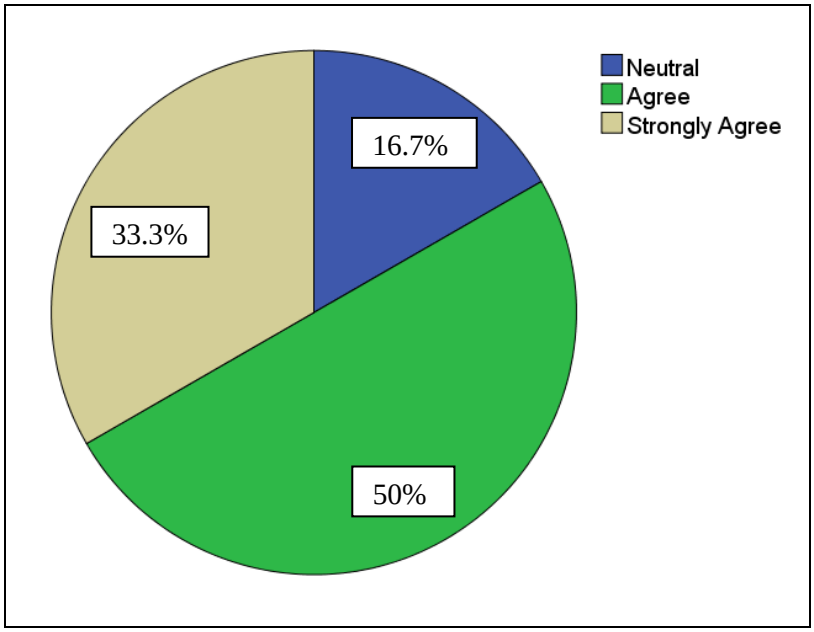


Figure 4.9: Pie chart on training, workshop and activities done by organisations

50 percent of total respondent answered agree and 33.3 percent answered strongly agree with the training, workshop and activities done by organisations to give knowledge for grassroots communities. The result proved that organisation should play a role in educating grassroots communities with the knowledge to manage GI for commercialisation.

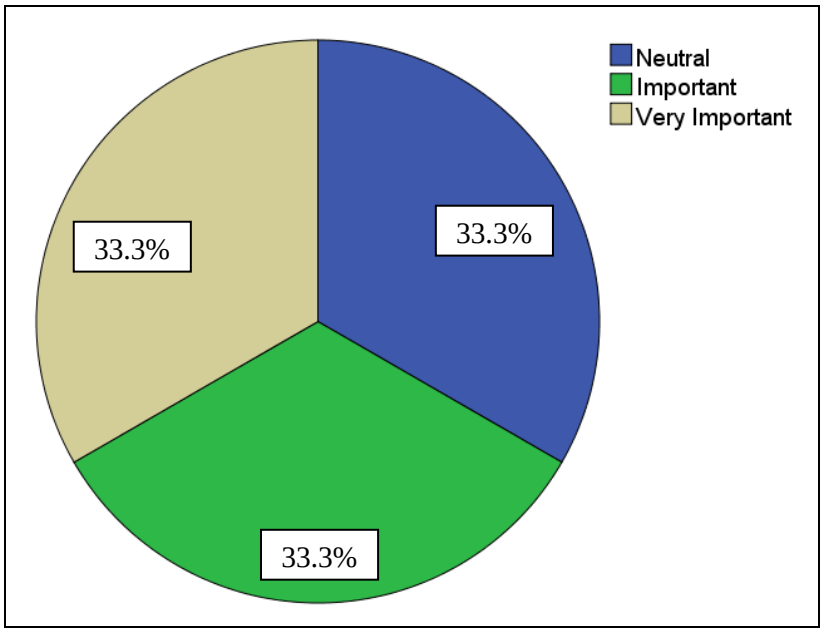


Figure 4.10: Pie chart on fundamental research to innovate GI

33.3 percent each of total respondents answered neutral, important and very important for fundamental research to innovate GI products. The result proved that conducting research on GI product are important in managing GI.

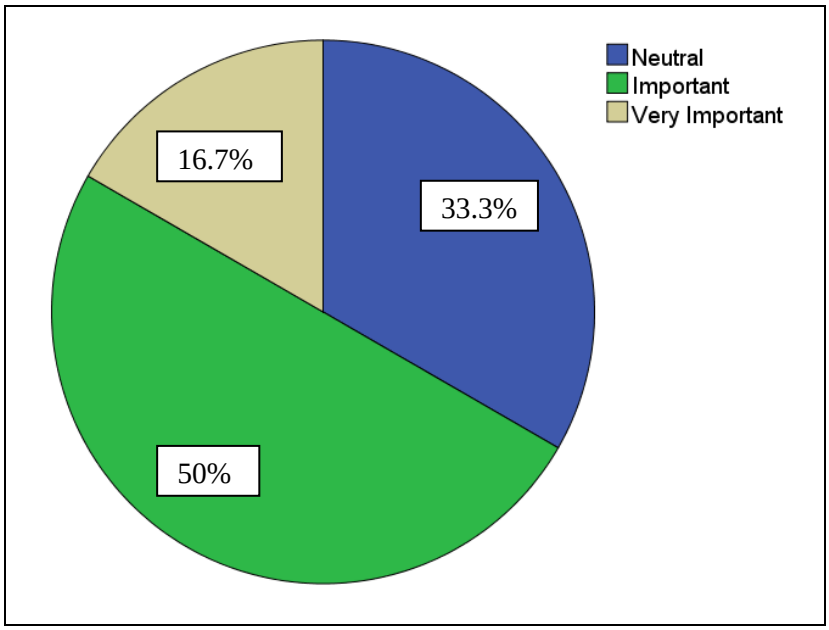


Figure 4.11: Pie chart on identifying the needs of existing products

50 percent answered important and 16.7 percent answered very important in the process of identifying the need of existing product. The result proved that identifying the needs of existing product are important in the management process of GI to create better and improved product.

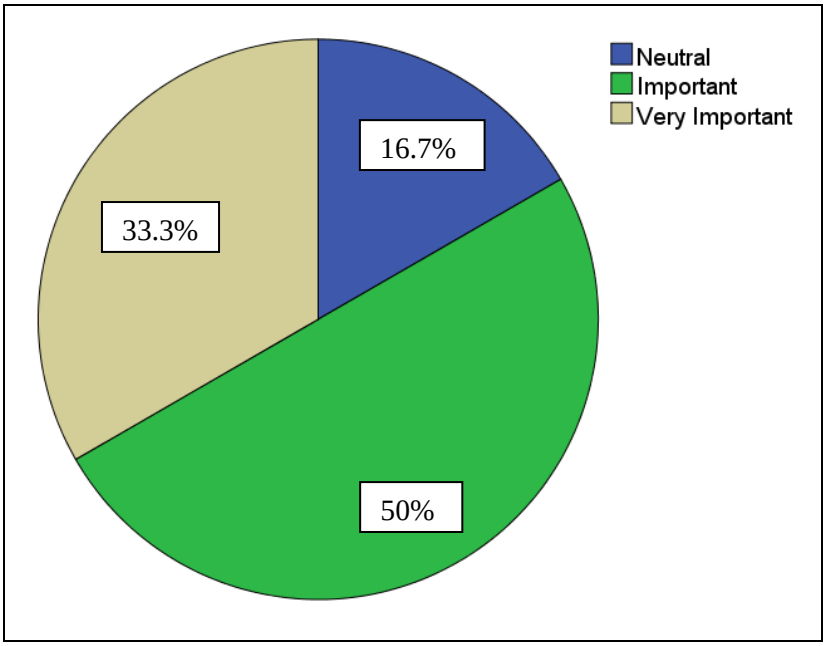


Figure 4.12: Pie chart on identifying the needs of new GI product

50 percent answered important and 33.3 percent answered very important in identifying the need of new GI products. The result proved that in the development of new GI product, user needs on each product are required to be justified.

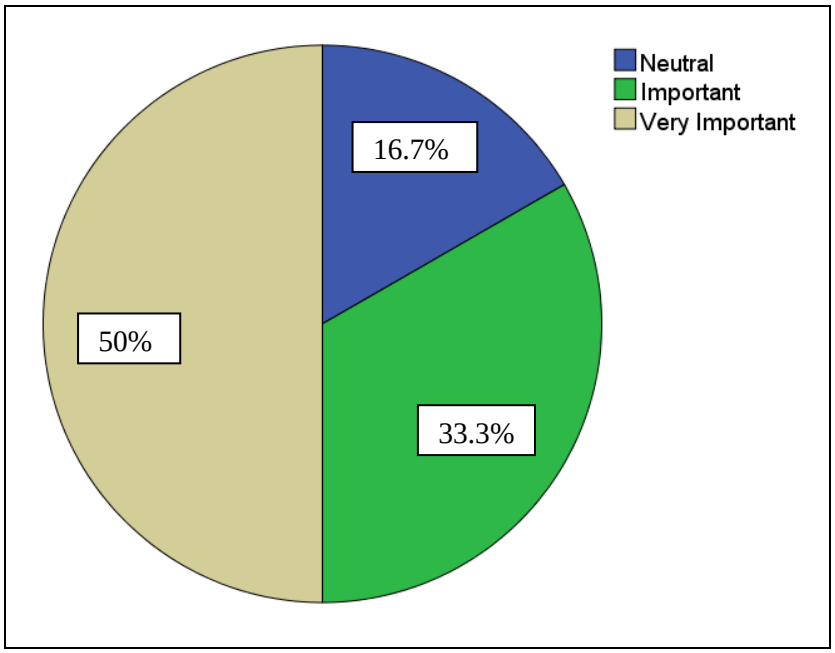


Figure 4.13: Pie chart on designing new GI product

50 percent of total respondent answered very important, 33.3 percent answered important in the process of designing new GI products. Respondents agree that the design process of idea development and product development of GI product are important in the management process of GI.

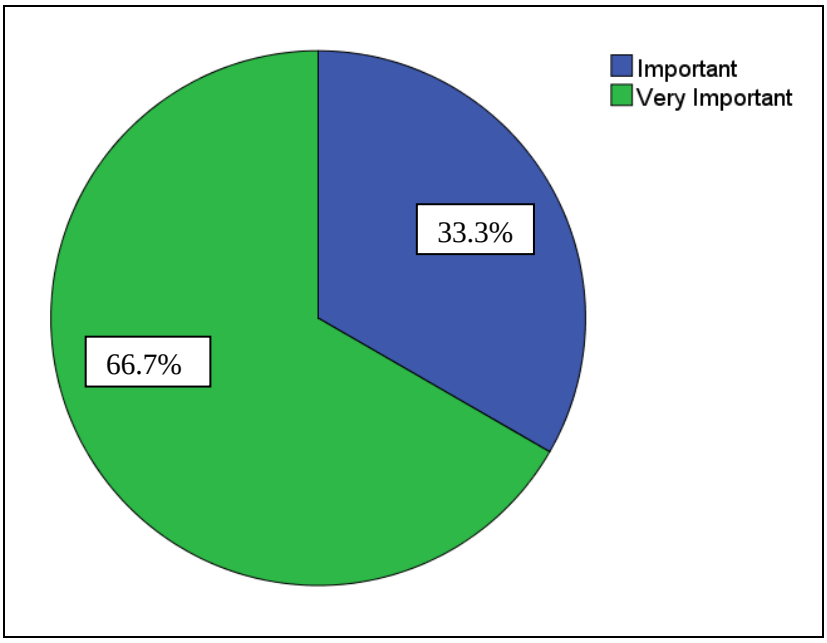


Figure 4.14: Pie chart on developing and improving the prototype of the new GI product

66.7 percent of respondents answered very important on the process of developing and improving the prototype of the new GI product. The result shows that process of developing and improving prototype in the design process is important to create a high quality product.

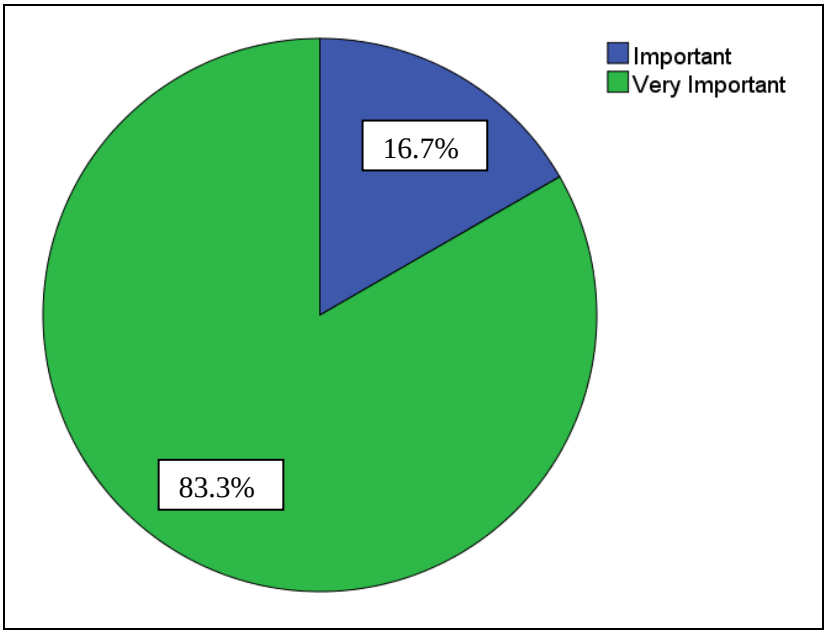


Figure 4.15: Pie chart on manufacturing the GI product

83.3 percent of respondents answered very important and the remaining 16.7 percent answered important in the manufacturing process of GI. Respondent totally agree that the manufacturing process of building the end product is important in managing GI. According to Wilson Sidek, (Appendix 13) the product need to be built from the best quality of material to create the best product.

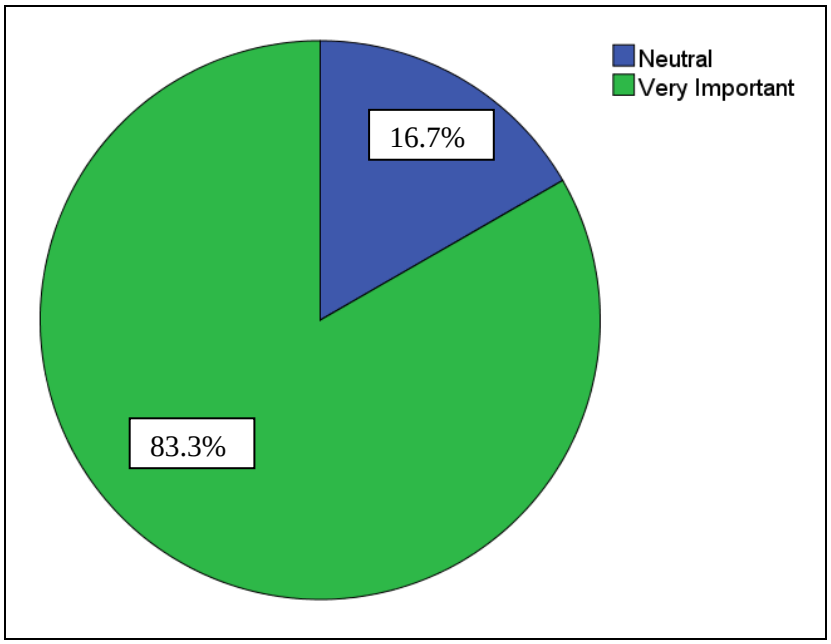


Figure 4.16: Pie chart on validate / testing the GI product

83.3 percent respondent answered validate or testing process of GI product as very important. The result showed that the validation process is useful to ensure the quality of the GI products. According to Wilson Sidek (Appendix 13) the most important process in making the GI products is to ensure the product in good quality and in the right measurement.

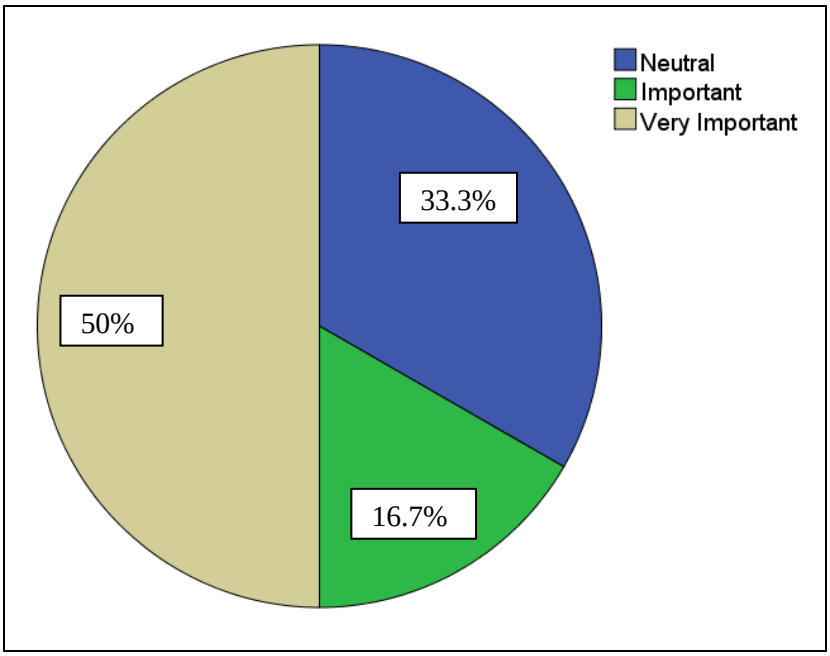


Figure 4.17: Pie chart on commercialisation study on GI

50 percent of respondents answered very important and 16.7 percent answered important in the commercialisation study of GI. The result proved that knowledge in commercialisation process are useful to introduce the GI products into the market.

4.2 Product Design Specification

Table 4.1: Summary on data analysis for questionnaires of GI products

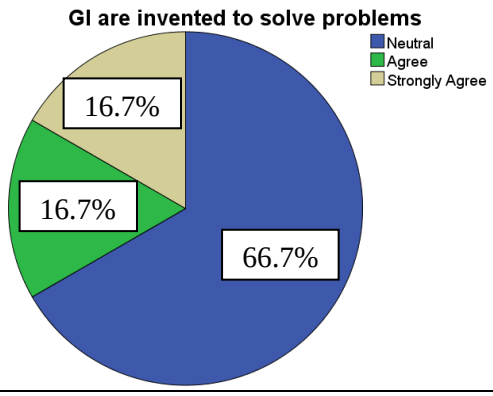
Pie Chart	Summary of Result
	The invention of GI products are not necessarily to solve problems.

Table 4.1: Continued

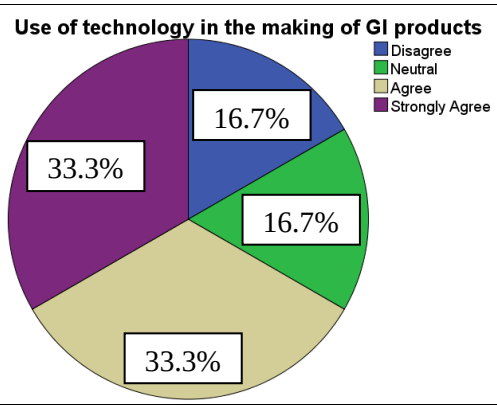
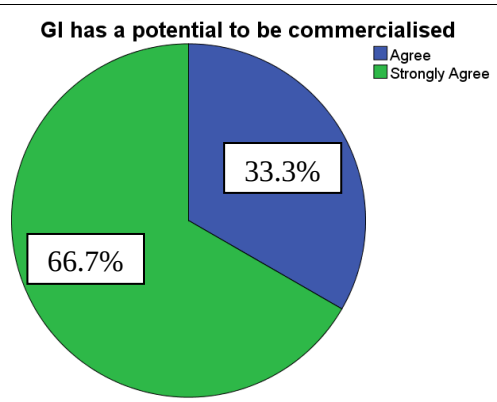
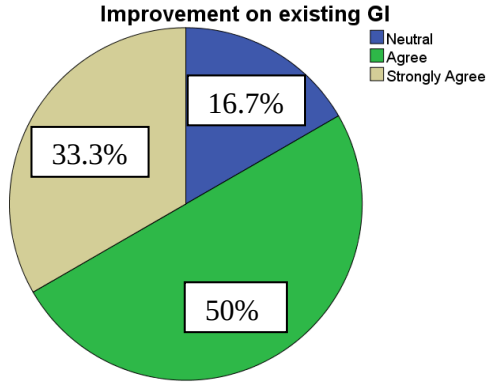
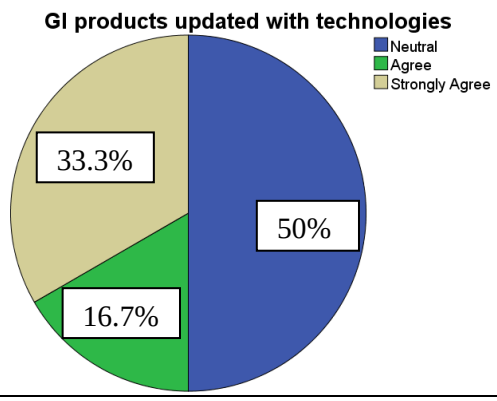
	The use of technology are needed for the process of making the GI products
	GI products has a lot of potential to be commercialised
	Existing GI products need to be improved
	GI products are not necessarily updated with technologies

Table 4.1: Continued

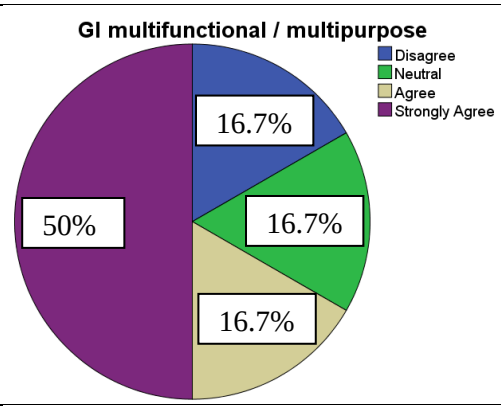
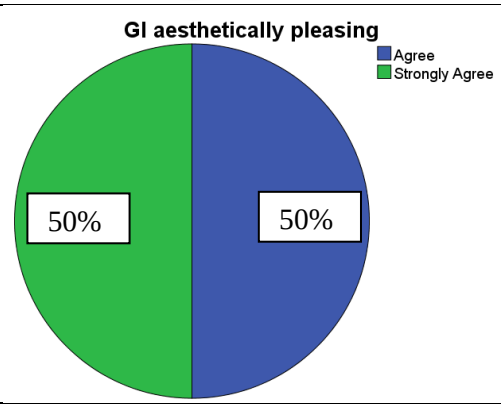
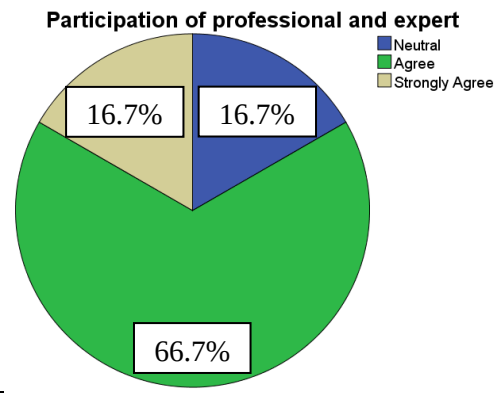
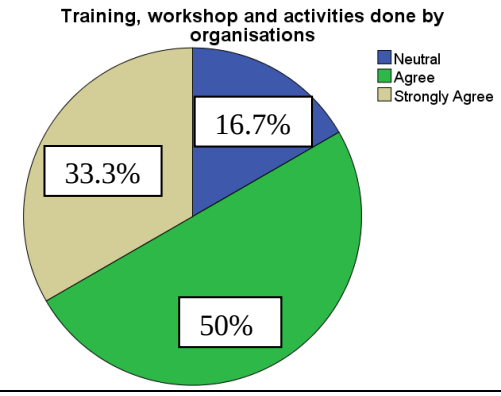
	It is important for the GI products to have multiple function
	GI product are not necessarily to be aesthetically pleasing
	Knowledge from professional and expert are important to create good design
	Training, workshop and activities done by organisations are needed

Table 4.1: Continued

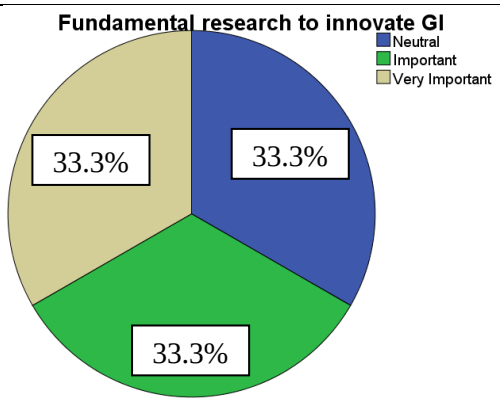
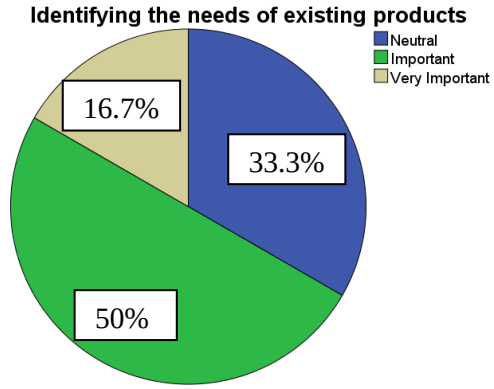
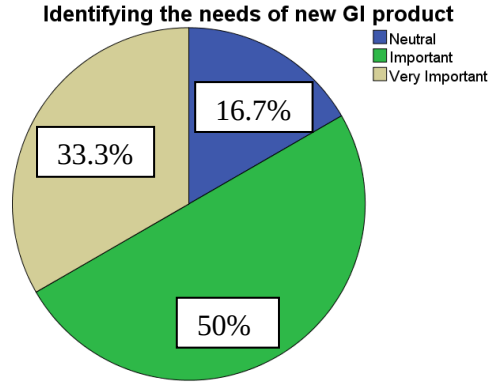
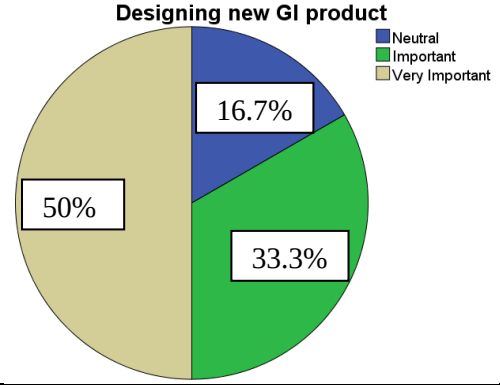
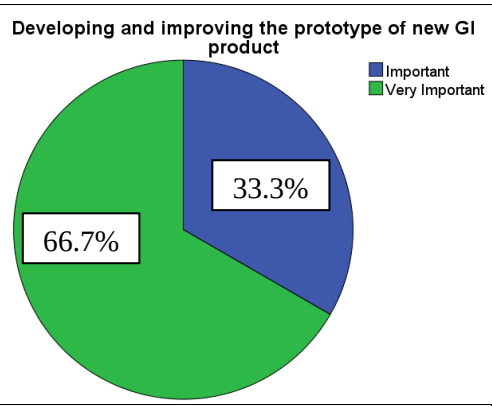
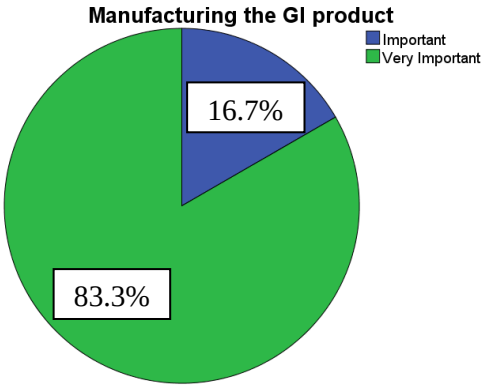
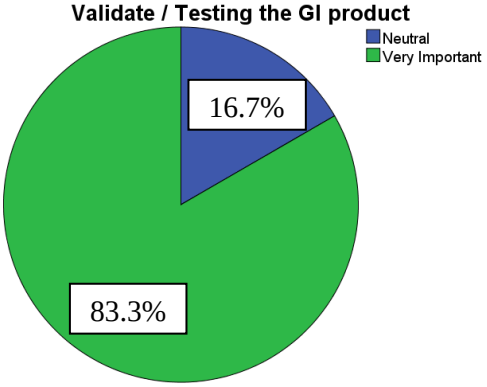
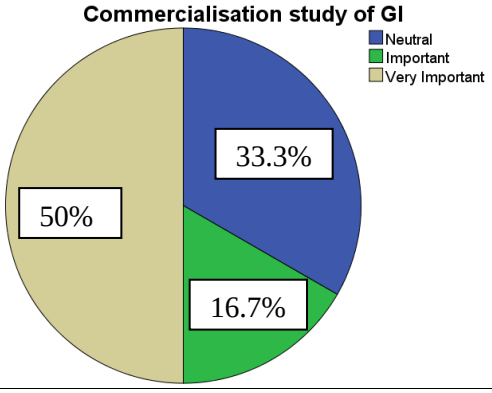
	Fundamental research to innovate GI products is important
	Identifying the needs of existing GI products are important
	Identifying the needs of the new GI products are important
	The process of designing for new GI products is important

Table 4.1: Continued

	The process of developing and improving prototype for new GI products are important
	The manufacturing process of GI is important
	Validation process to ensure the quality of GI products are useful
	Commercialisation study on GI products are very important

Data collected from the Questionnaire on GI specify the Product Design Specification (PDS) of new GI products for case study. From Table 4.1 above, PDS of new develop products for case study need to be solve existing problems, aesthetically pleasing and multipurpose. For the process of creating the best design, participation of professional and expert are required. Respondent agrees with the training, workshop and activities done by organisation to educate grassroots inventor with knowledge in managing GI products for commercialisation. Result from collecting data on important of processes that need to be considered in the context of managing GI testified that fundamental research to innovate GI, design process, developing and improving prototype, manufacturing and validation of product are the important processes that need to be considered in creating GI products for commercialisation.

4.3 Identifying Product for Case Study

Early investigation on identifying the potential of GI product had been done through observation. The first phase of observation had been done by visiting potential places of GI products such as market area, housing area all around Kuching and museum that display the varieties of traditional products. From all the information that had been collected, the researcher had divided the GI into five different categories of wearable product, daily use product, material, food and services. Example of wearable product are clutch made from used footwear (Figure 4.18) and recycled tyre rubber footwear (Figure 4.19).

Figure 4.18: Clutch made from used footwear

Figure 4.19: Recycled tyre rubber footwear (www.pinterest.com, 2016)

Example of daily use product that categorised as daily use product is Load Carrier for Labourer (Figure 4.20).

Figure 4.20: Load Carrier for Laborer (http://trak.in/tags/business/2011/08/03/innovative-product-design-load-carrier-labourers/, 2015)

The material known as relating to or the matter which something are made. The example of material category for GI is sago bark boxes (Figure 4.21).

Figure 4.21: Sago bark boxes

Nowadays, there is a lot of food that had gone through some kind of innovation. The food that had been innovated was the ‘dabai’ fruit that usually grow in Sarawak area. The fruit had been developed into a paste known as ‘Dabai’ Fruit Paste (Figure 4.22).

Figure 4.22: 'Dabai' Fruit Paste (http://fazlisyam.com/2010/12/27/meneroka-potensi-buah-dabai-sarawak/)

The fifth category of GI product is service. A service is known as a system that supplying a public need. Example of service category for GI was ingenious method to move a boat (Figure 4.23) where a number of tree trunk is arranged to certain distance to move a boat into the river.

Figure 4.23: Ingenious method to move a boat (*Laporan Jejak Inovasi Sarawak*, 2014)

The second phase of identifying the GI for case study is to fix the chosen category of GI product for case study. Researcher had continued the search on the subject for case study through observation into smaller places where the five categories of product are available.

The first study was on wooden material products made by Lekem Anak Toseng. Lekem produce a lot of daily use product to be used by his family and to be sold upon requested. The example of products made by Mr Lekem was listed out in Appendix 2.

Another inventor of daily use products made from wood is Sidek Anak Toseng. Sidek is a talented craftsman working with 22 years of experience making the crafts made from wood. Sidek had produce varieties of product range of daily use product of small storage, flower vase, plate, ladle, decorative tools to traditional costume. The example of products made by Sidek is listed on Appendix 3.

Kosim Miardi is a GI product entrepreneur from Indonesia. He sold various kinds of daily use products made from coconut shell and wood. The example of GI product sold by Kosim is listed in Appendix 4.

Tasiana is a local GI entrepreneur that sold different kind of products made from rattan. The example of rattan product sold by Tasiana were rattan baby chair, rattan mat and other product made by local people. The list of products sold by Tasiana are shown on Appendix 5.

Serikin Market sold varieties of products make from different kind of material. The type of products sold in Serikin Market are winnow made from bamboo skin, luffa fiber, rattan product, ceramic product and stone mortar or mortar and pestle. The example of GI product available at Serikin Market are shown in Appendix 6.

Researcher had made the observation in Malaysian Handicraft Promotion held in Kuching. The products on display are mostly craft product, such as basket, lamp, women's accessories and various kinds of handicraft. The example of GI product for sale during the promotion are shown in Appendix 7.

Researcher had done a study on a product made by Oliver Edward Rijer. Oliver had invented a coconut grater made from dynamo of a washing machine and a plastic basin. The product is classified as GI products as the product are made from recycled product and limited component to solve the problem occurred when grating the coconut. The coconut grater product is shown on Figure 4.24.

Figure 4.24: Coconut grater made from washing machine dynamo and plastic basin

4.4 Clarification of Luffa Fiber as Product for Case Study

Luffa fiber has been choosen as the products for case study. Through the observation that had been done by researcher, luffa fiber are not really well developed and luffa fiber are only sold as a raw material. Due the potential innovation and commercialisation demand on this product, researcher had decided to developed the products for case study.

Figure 4.25: Luffa fiber and luffa plant on the tree
(https://wolfieg.files.wordpress.com/2014/03/imgp4628.jpg, 2014)

Luffa plant is categorised as cucurbit, group of vine plants such as gourds, pumpkins, and cucumber (Blumenstock, 2015). Luffa sponge gourds also known with a lot of different names, both common and scientific. They are known as loofah, loofah sponge, loofa, luffa, loufa, loufah, luffah, sponge gourd, Chinese okra, elephant okra, dishrag gourd, towel gourd, and other name in many different languages. The scientific name for the sponge gourds Luffa for this research is *Luffa aegyptiaca* or *Luffa Cylindrica*. Other fiber producing species of the Luffa genus are *Luffa Acutangula* and *Luffa Operculata*. Angled Luffa or ridged Luffa are common names for acutangula. Luffa operculata also known as ball luffa or sponge cucumber (Blumenstock, 2015).

The pollinated flowers of Luffa grow into cylindrical green fruits that eventually develop into a seed pod filled with many intertwined cellulose fibers. Luffa fiber comes from a type of vines called luffa or *petola* (in local language). It is also known as sponge gourd. During its maturity, it is edible to harvest. Luffa is in dark green colour. The mature plant that is dried and leave only its xylem or fiber are then cleansed thoroughly can be used as kitchen sponge and bath scrub. In Sarawak, Luffa or *petola* fiber could be found easily compare to in West Malaysia. Luffa Fiber are sold from RM5 to RM8 per pieces depending on the size.

Figure 4.26: Dried luffa

4.3.1 Characteristics of Luffa

Luffa products characterised as biodegradable, natural and renewable resource. Luffa sponges come from the fibrous interiors of luffa sponge gourd plant (*Luffa aegyptiaca mill*) (Davis, J. 2008). Mature fruits are 1 to 2 feet in length on average, but can grow much longer. The xylem tissue within the fruits forms a dense fibrous network that creates support system for maturing seeds. If the hard outer skin of the seeds is removed from the dried luffa, the dense fiber functions as a natural scrubbing tools (Miles, 2016).

Luffa sponge has been imported all around the world including China, El Salvador, Korea, Taiwan, Guatemala, Columbia, and Venezuela. In Sarawak, luffa had been grown in home gardens throughout Samarahan and Kuching area. Luffa sponge gourd plant is an annual vine with tendrils and large, cylindrical fruit that are edible when young. Mature and dry luffa fruit consists of hard shell surrounding its stiff, dense network of cellulose fibers, for support and dispersal of hundreds of flat smooth black seeds. Environmentally conscious users agree that luffa products are biodegradable, natural, and a renewable resource (Blumenstock, 2015). In other countries, luffa had been used to make household cleaning products for scrubbing pots, pans, barbecue grills, tires, and many other surfaces that are not harmed by the abrasive fibers. The tough characteristic of luffa fibers can also be processed into industrial products such as filters, insulation, and packing materials.

4.3.2 Luffa Varieties

Garden varieties of luffa are coarser, less dense, and more flexible than the thicker pieces of commercial loofah. They are fast growing types compare to the high fiber. A less dense loofah with finer fibers is often flexible and could easily moulded into things like luffa soap. Commercial loofah was grown for consistent size and fiber density. Denser loofah is

better for users that require strength and durability. Denser loofah with more fibers, are more stiffer. The higher the density of its fiber, the longer it takes to reach maturity.

4.3.3 Luffa Gourd

Luffa is a vigorous climbing cucurbit that requires trellising. There are two species of cultivated luffa gourds; angled luffa (*Luffa acutangula*) and smooth luffa (*Luffa aegyptica*). Mature fruits are 1 to 2 feet in length on average and can climb up to 15 feet high. If the hard outer skin and the seeds are removed from dried luffa, the dense network of fibers functions as a natural scrubbing tool. The fruits must be harvested immature, as mature fruits become inedible due to their extremely bitter taste.

4.3.4 Harvesting and Preparing Luffa Sponge

Mature loofahs are ready for harvesting when the skin loses green colour and becomes looser when mature. Mature sponges begin to dry and lose water weight. When the loofah was green, they may contain some fiber but be much much harder to peel. Getting them wet or soaking in water may help the opening process but is optional. After peeling, wash them well to remove the remaining green and brown coloration. Soak in light bleach water will lighten the loofah. Then, squeeze out excess water and lay out to dry. Place them under the sun and wind may dries them quickly. To get rid of the seed, cut open the sponges or make it to a loofah fiber mat. The drier the sponges are, the easier the seeds will fall out.

4.3.5 The Used of Luffa

Luffa had been used to make household cleaning products for products that are not harmed by abrasive fiber, industrial products such as filters, insulation, packing materials and craft products (Blumenstock, 2015). Due to the gently abrasive quality of the natural fiber,

luffa had been used in the eco-friendly cosmetic industry. Angled Luffa are grown for eating purposes, whereas smooth luffa most commonly grown for household cleaning (Miles, 2016).

4.3.6 Commercialisation of Luffa

Imported and high-quality sponges are plentiful and inexpensive. Production costs must be kept very low to be competitive (Blumenstock, 2015). In Sarawak especially Kuching area, most of the local people using raw piece of luffa sponge on its original state or size. The study on luffa might bring to the development of luffa fiber into more innovative and profitable product.

4.5 Summary

GI products had a lot of potential to be developed. A lot of benefit could be gained through the development and commercialisation of GI products. As a useful GI product with a lot of potential to be innovated, luffa could be utilised to make a new innovative product. The development of luffa fiber material into innovative product will utilise the benefits of luffa fiber. Luffa fiber features are suitable for cleaning purpose and to create a cleaning product. (Further information on Chapter Five)

CHAPTER 5

CASE STUDY AND

STRATEGISING THE COMMERCIALISATION PROCESS

Overview

This chapter provides the approach used to identify the product development of this research and the product development process of new GI products. This chapter also provides the process of designing the commercialisation strategy for management process of GI products and the new management strategy in commercialising the GI products.

5.0 Introduction

The case study for this research is product development for luffa fiber. The product development process comprises the process of identifying the problems, design process, fabrication process of products and validation or testing of products.

5.1 Product Development

Based on the observation done to identify the potential GI products, luffa fiber has been choosen as the products for case study. Case study was done to develop the luffa fiber that was categorised as GI products into new innovative products. The characteristics of luffa fiber that was suitable for cleaning purpose has generated the idea to produce household cleaning products. The type of products that had been identified were shower sponge, oven mitt, dishwashing sponge and bottle brush. All the products are made from one similar material of luffa fiber. Product Design Specification (PDS) for the luffa fiber products were based on the data collected from the Questionnaire of GI (refer to Chapter 4 on Data Analysis Output). PDS for the new develop products for case study are stated on Figure 5.1. The PDS

of new product to be developed in case study are serves people's needs, aesthetically pleasing and multipurpose. Important processes that need to be considered in the context of managing GI are fundamental research to innovate GI, design process, developing and improving prototype, manufacturing and validation of product.

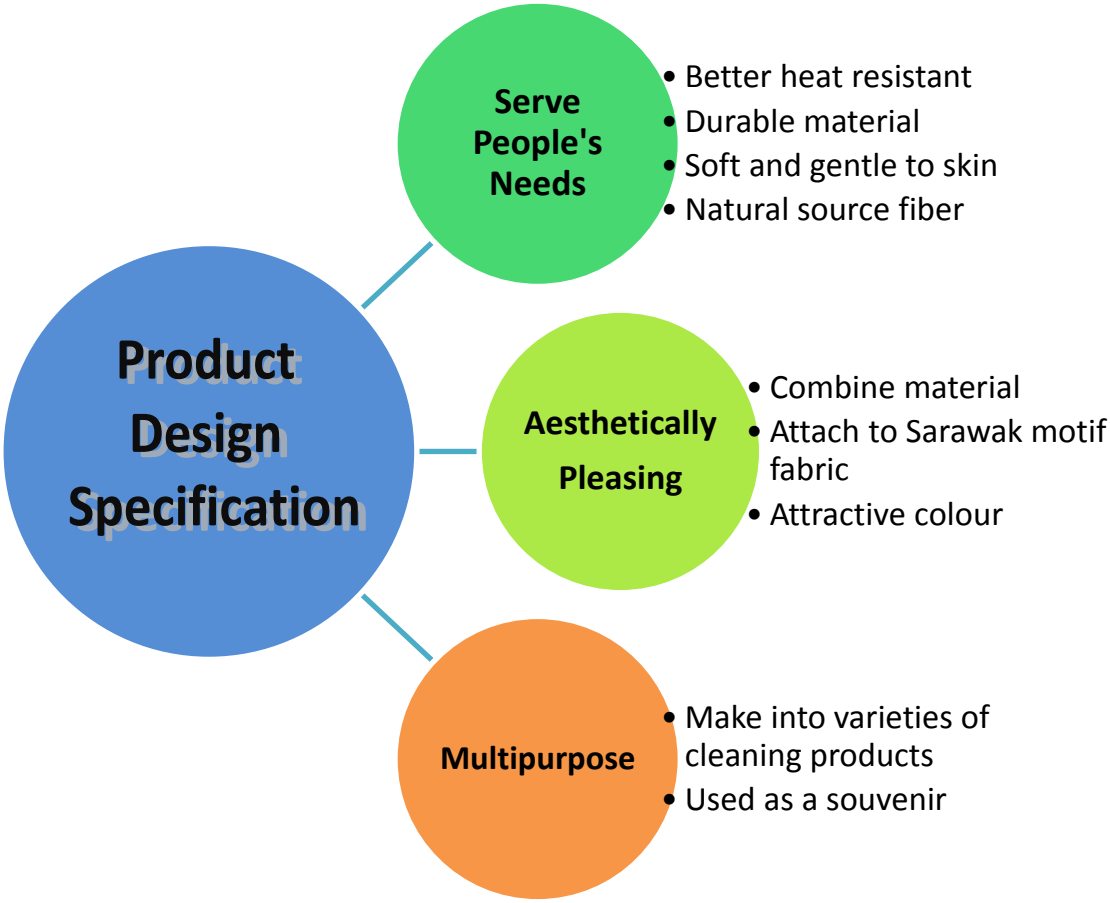


Figure 5.1: Product Design Specification of new luffa fiber products

5.2 Design Process

The design process for the research comprise of the design development and fabrication process of the end product. Four types of product are created using one similar material of luffa fiber. The products are luffa shower sponge, luffa oven mitt, luffa dishwashing sponge and luffa bottle brush.

5.2.1 Product I: Luffa Shower Sponge

The idea development are started with doing observation and research on the existing shower sponge products. Researcher studies the references on shower sponge to identify the latest design and colour use for the present shower sponge.

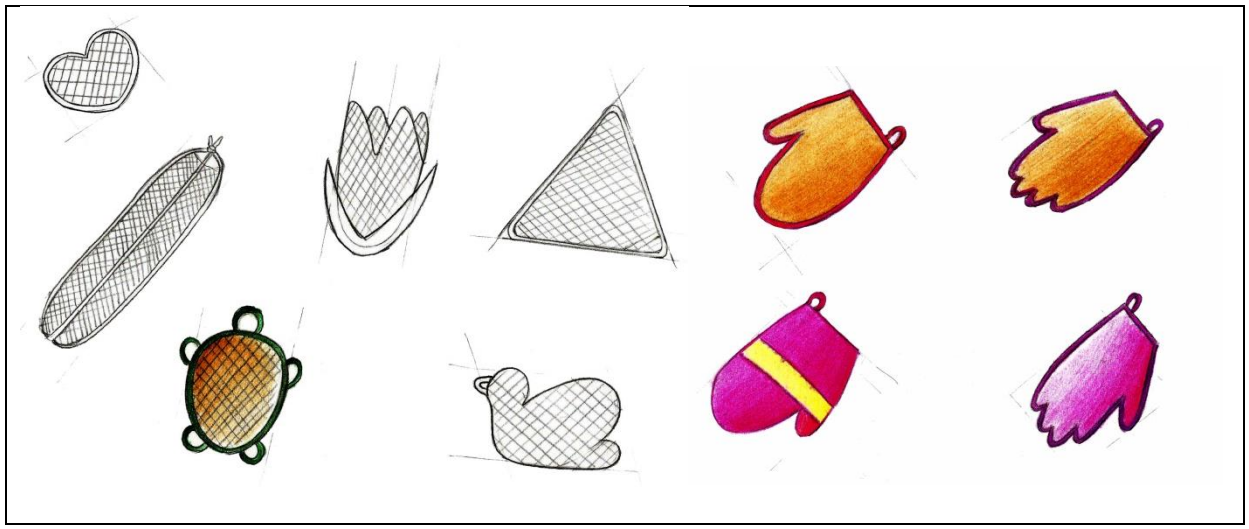


Figure 5.2: Luffa shower sponge sketches

Shower sponge was used to clean the body during shower. Researcher comes out with sketches of ideas on living object such as animal, plant and human hand shape to clarify the natural sources of luffa fiber. The final idea development that researcher had chosen for the luffa shower sponge was the human hand shape as the design is ergonomic and easily to be held by hand. The shape was easy to be adapted to the use of the product which is for body cleaning purpose.

The fabrication process of luffa shower sponge is detailing on Figure 5.3. The step by step process of making the product are summed up on the figure.

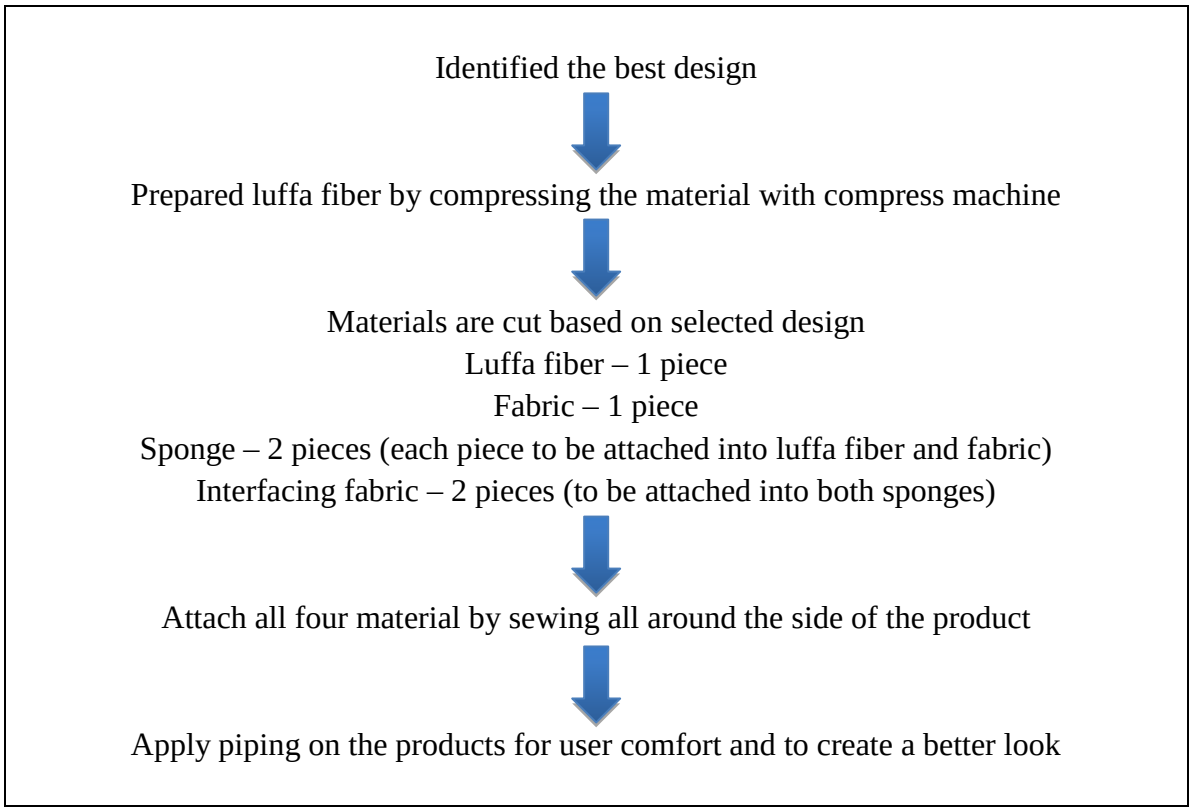


Figure 5.3: Fabrication process of luffa shower sponge

The final product of luffa shower sponge was shown on Figure 5.4. Only one side of the shower sponge was attached to the luffa fiber. The other opposite side of the product are attached to the fabric on Sarawak ethnic motif. The purpose of the design is for tourism approach of the products. Through this type of design, luffa shower sponge not only function as a shower sponge but could be a kind of souvenir for tourism purpose. The multipurpose function of GI product is the PDS as required by the user of the GI products. The material used in making this product are light and easily to be dried.

Figure 5.4: Luffa shower sponge final product

5.2.2 Product II: Luffa Oven Mitt

Researcher had done the study on the oven mitt product to identify the appropriate design and size of the product. The design and shape of the product are considered to be used on hand to hold different kind of oven tray and hot pot. The idea development for the luffa oven mitt were shown on Figure 5.5.

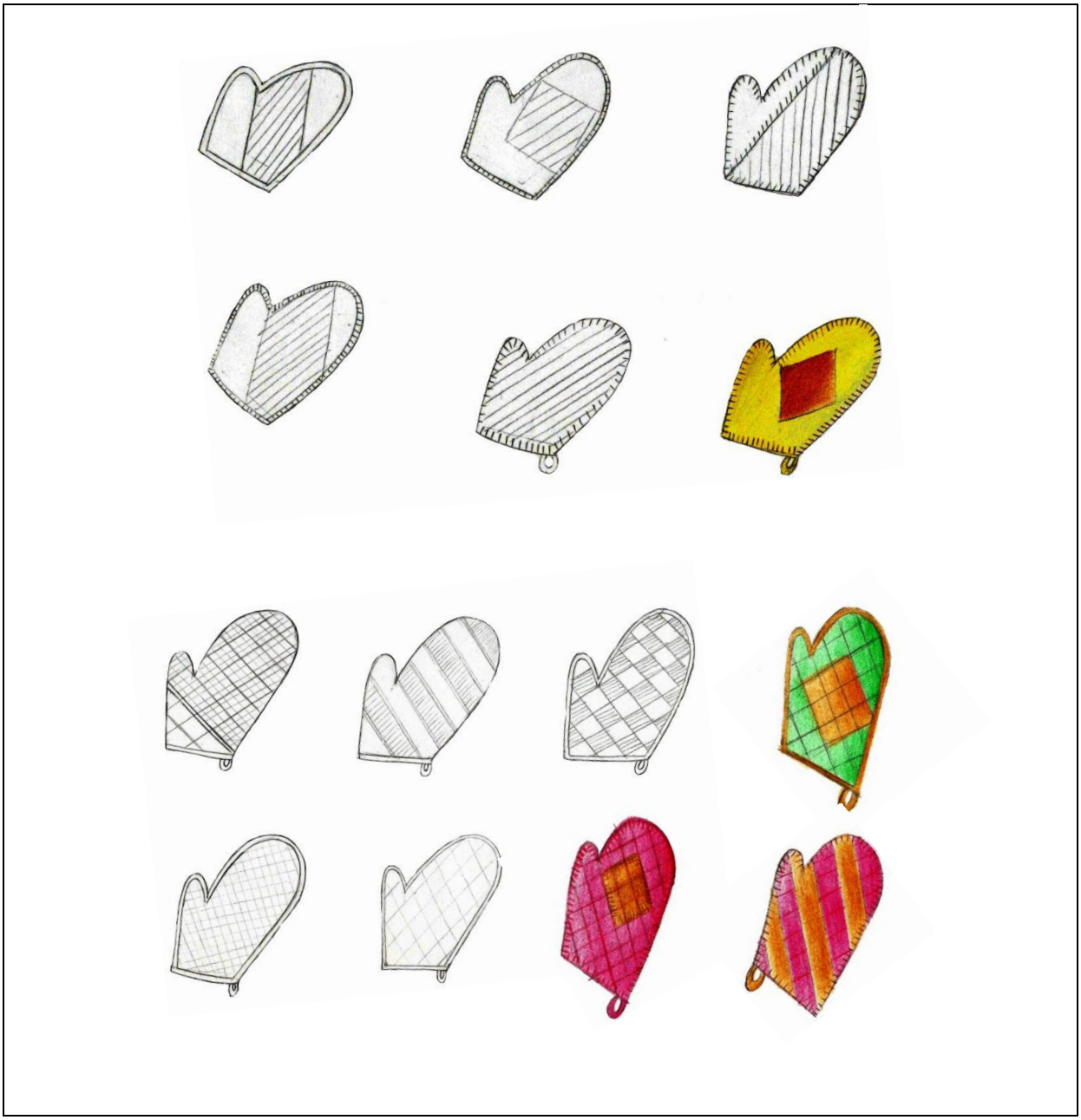


Figure 5.5: Luffa oven mitt sketches

Researcher chose the shape of hand from existing oven mitt to be adapted with the luffa fiber. Researcher developed the exterior appearance of the product to attach the luffa fiber on it. In developing the design, the method to attach the fabric with luffa fiber need to be taken into consideration as both materials has different thickness and structure.

The fabrication process of luffa oven mitt is discussed in Figure 5.6. The figure describe the detailing step on making the end product of luffa oven mitt.

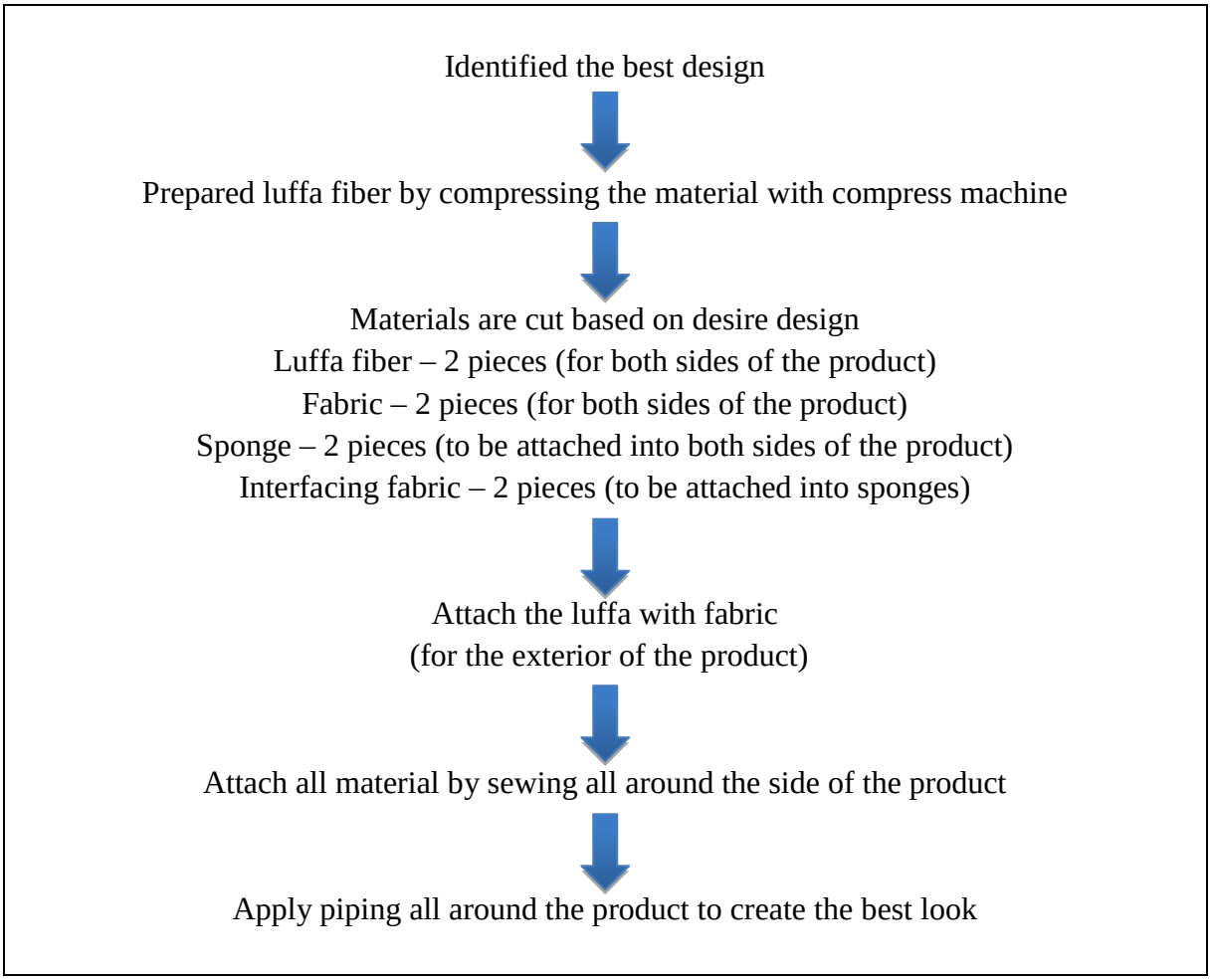


Figure 5.6: Fabrication process of luffa oven mitt

Final product of luffa oven mitt are shown on Figure 5.7. The design on both sides of product are similar. The luffa fiber oven mitt could be used by both left handed and right handed people.

Figure 5.7: Luffa oven mitt

5.2.3 Product III: Luffa Dishwashing Sponge

Luffa dishwashing sponge is used to wash the dishes made from different type of material. Luffa sponge is suitable to clean different type of household products too.

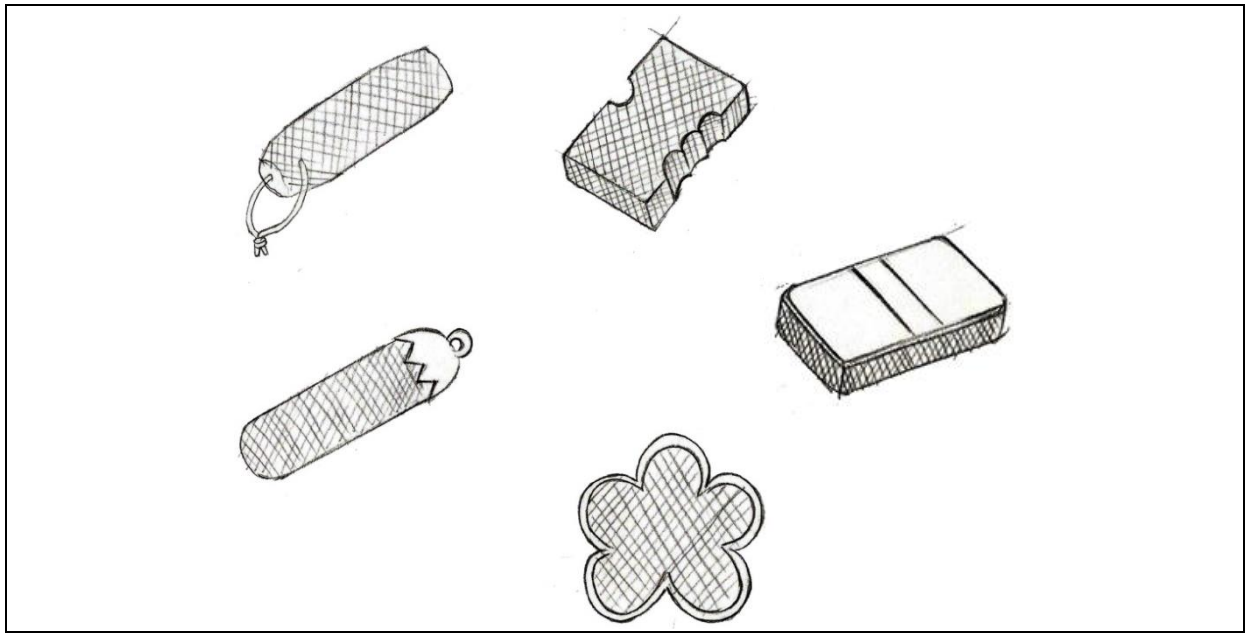


Figure 5.8: Luffa dishwashing sponge sketches

The idea development of luffa dishwashing sponge through sketches are inspired from different shapes. Researcher chose the simple design as it could easily be held by hand. The

square shape has been selected for the dishwashing sponge as it is simple and could be efficiently used on different type of product as well.

Figure 5.9 defines the steps of fabrication process of luffa washing sponge. The fabrication process of the product is simple, but the things that need to take into count is the best type of glue to be used for the product.

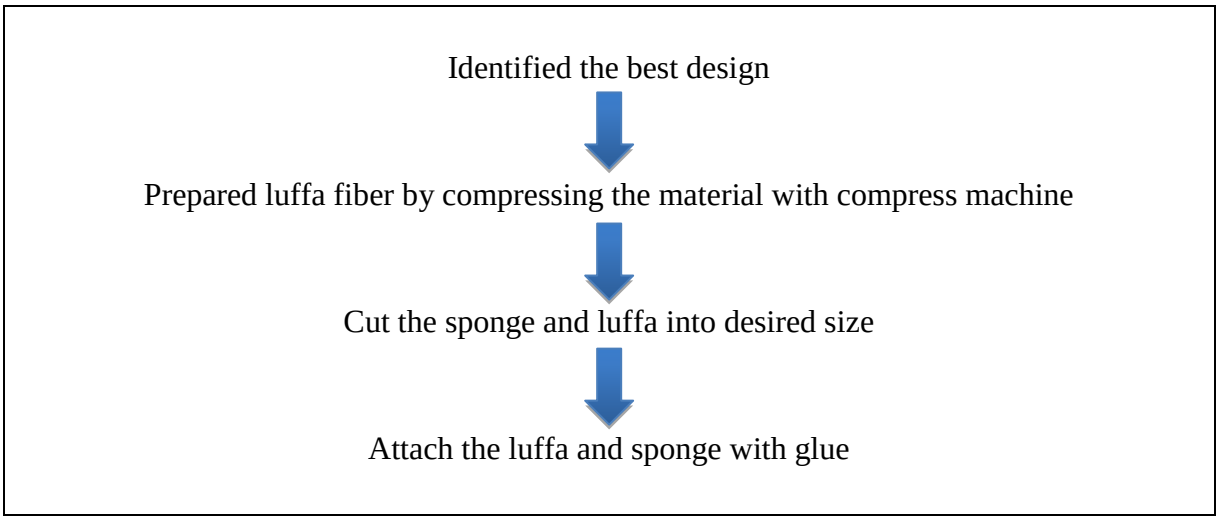


Figure 5.9: Fabrication process of luffa washing sponge

The researcher had conducted he experiment to determine the best glue to bond the luffa fiber with sponge. The suggested type of glue was stated on Table 5.1. The bonded luffa sponge (Figure 5.10) are then soaked on the water (Figure 5.11) for several days to determine the strength of the glue when contact with water.

Table 5.1: Experimentation on the glue to bond the luffa fiber and sponge

No	**Type of Glue**	**Use of Glue**	**Period of Efficiency**
1	Multi Bond Industrial Strength All-Purpose Adhesive	Vinyl pools, glass, fabric, metal, paper, leather	More than a week
2	V-tech Shoe Adhesive (Water &	Shoe & bag	More than a week
3	UHU All Purpose Adhesive	All type of products	3-5 days

Figure 5.10: Luffa fiber atttached to sponge with different type of glue

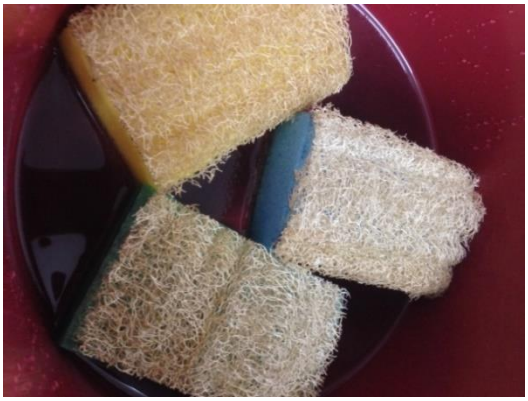


Figure 5.11: Luffa fiber attached to sponge are soak in water for several days

The final product of luffa dish washing sponge was shown on Figure 5.12. The product is easily to be hold and could be used on different kind of dish ware products. The rough structure of the luffa sponge makes the cleaning process become smooth. The luffa dishwashing sponge is easily dried and very light.

Figure 5.12: Luffa dishwashing sponge

5.2.4 Product IV: Luffa Bottle Brush

Luffa bottle brush is used to clean the bottle. The flexible features of luffa fiber make it possible to wash the inside of a bottle. Figure 5.13 showed the sketches for design development of bottle brush. Study on existing bottle brush become the references for ideas. The design is done to contemplate to the features natural feature of luffa fiber. The design of folded luffa sponge had been chosen as the final design for luffa bottle brush.

Figure 5.14 determines the fabrication process of luffa bottle brush.

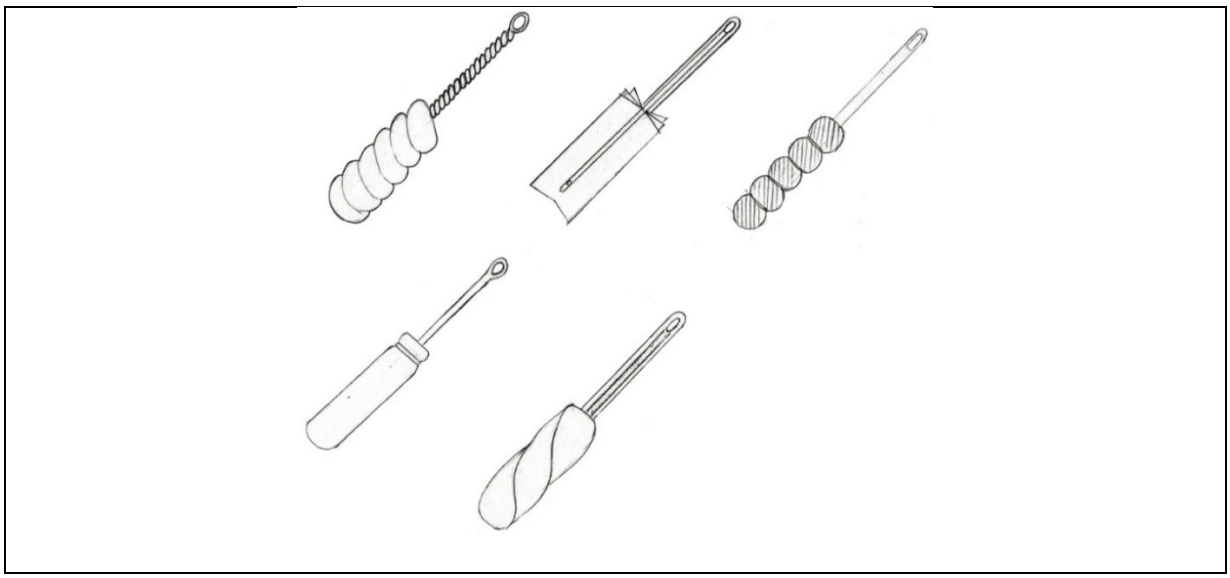


Figure 5.13: Bottle brush sketches

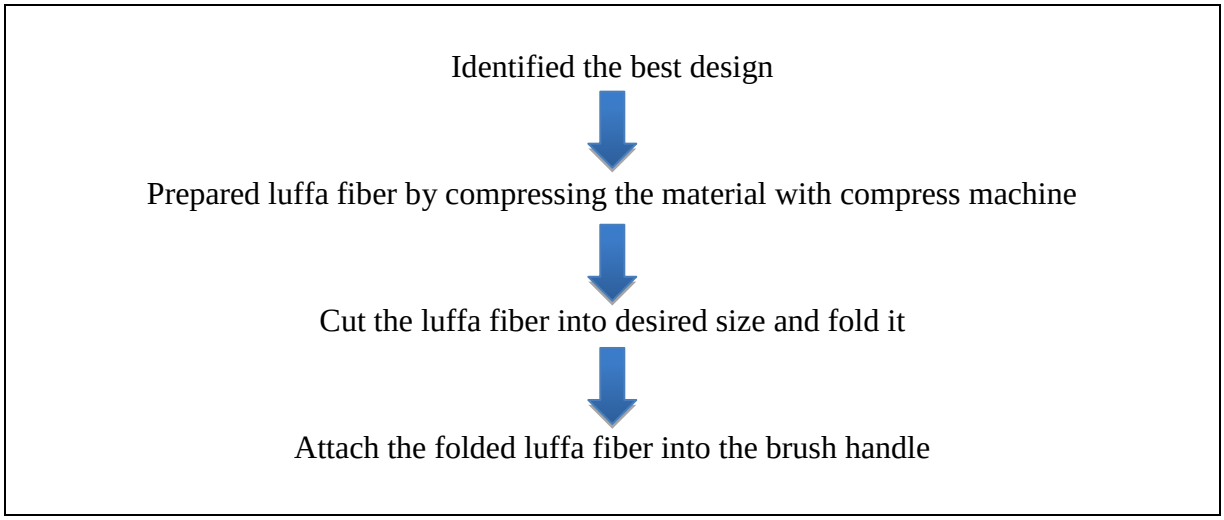


Figure 5.14: Fabrication process of luffa bottle brush

Figure 5.15 is on the final product of the luffa bottle brush. The characteristics of luffa bottle brush that are light and easy to be clean make it possible for any type of bottle. Luffa bottle brush could be easily detached from the handle to change the luffa sponge.

Figure 5.15: Luffa bottle brush

5.3 Strategising Commercialisation Strategy for Management Process of GI Products

5.3.1 Introduction

The data collected from Data Collection Output and Case Study were used to create the commercialisation strategy for GI products. References in the existing commercialisation study give the researcher the clearer approach to strategising the commercialisation process. Collected data from the interview questions on Commercialisation Strategy of GI Products are applied too, to design the commercialisation strategy for management process of GI products.

5.3.2 Application of Data from Case Study

The Management Strategy in Commercialising the GI product started with identifying the potential GI product for commercialisation. The existing GI product made by grassroots community is considered as new ideas and serve as problem solving products.

The potential GI product are then selected and become the subject of case study for this research. Products for the case study enter the phase of design development to create a new innovative GI product. The design development process is important in making the product saleable. Throughout this process, research on recent demand in colours, function, unique features and quality of product were adapted to the new GI products. In the product development process the SWOT analysis of strength, weakness, opportunities and threats are considered to develop a good product. For this research, luffa fiber considers as the potential GI products for commercialisation. The products produce for the case study are shower glove, oven mitt, dishwashing sponge and bottle brush made from luffa fiber.

The fabrication process was done after the design development phase. Results from the design development process were considered for the manufacturing process. The best design of each types of product was appointed to be the final design. The real product is manufactured with the consideration of material used and the process of producing the products. The phase of product validation needs to be conducted to identify the performance of products before the product could be considered as a potentially commercialised product. Completed products with commercial potential were ready for commercialisation process.

5.3.3 Application of Data Collected from Interview (Appendix 14)

The items that need to be considered in commercialisation of products are the 4P's marketing mix strategy. The 4P's marketing mix strategy are the product, place, price and promotion. The 4P's marketing strategy for luffa fiber GI product are stated in Table 6.1.

Table 5.2: Marketing Mix for luffa fiber products

Marketing Mix	Focus	Strategy
Product	Selling point or Uniqueness of product	Luffa Fiber a kind of eco-friendly products
Place	Marketing Location	Through social media to introduce the product eg: Facebook, Instagram, Twitter etc.
		Direct selling to people demanding for the product
Price	Cost of manufacturing	Selling price covers the cost of worker salary, material used, production machine and etc.
Promotion	Promotion strategy	Doing sale in target market; user of the product eg: Female does house chore

The next commercialisation strategy in commercialising the GI products is building brands. Building brands are important as a ways for the products to compete in the market. Brands could create the identity of the products as people always associate the product with brands. When buying products, people are buying the brands too.

To build trust from others on the product, the business needs to be registered (Mahani, 2016). Registering business could make the business look stronger and others company is more trusted in dealing with registered business. The registration of business could also be the preparation to enter wider market. The Companies Commission of Malaysia or Suruhanjaya Syarikat Malaysia (SSM) is a body that formed from the merger between the Registrar of Companies (ROC) and the Registrar of Business (ROB) in Malaysia. SSM function as an agency to incorporate companies and register business as well as providing information about company and business to public (SSM website). Registration of new business with SSM could bring a lot of benefits to maintain the positive developments in small business or cottage entrepreneurial sectors. For this research, the registration of business and company are not undertaken as these become the limitation of research.

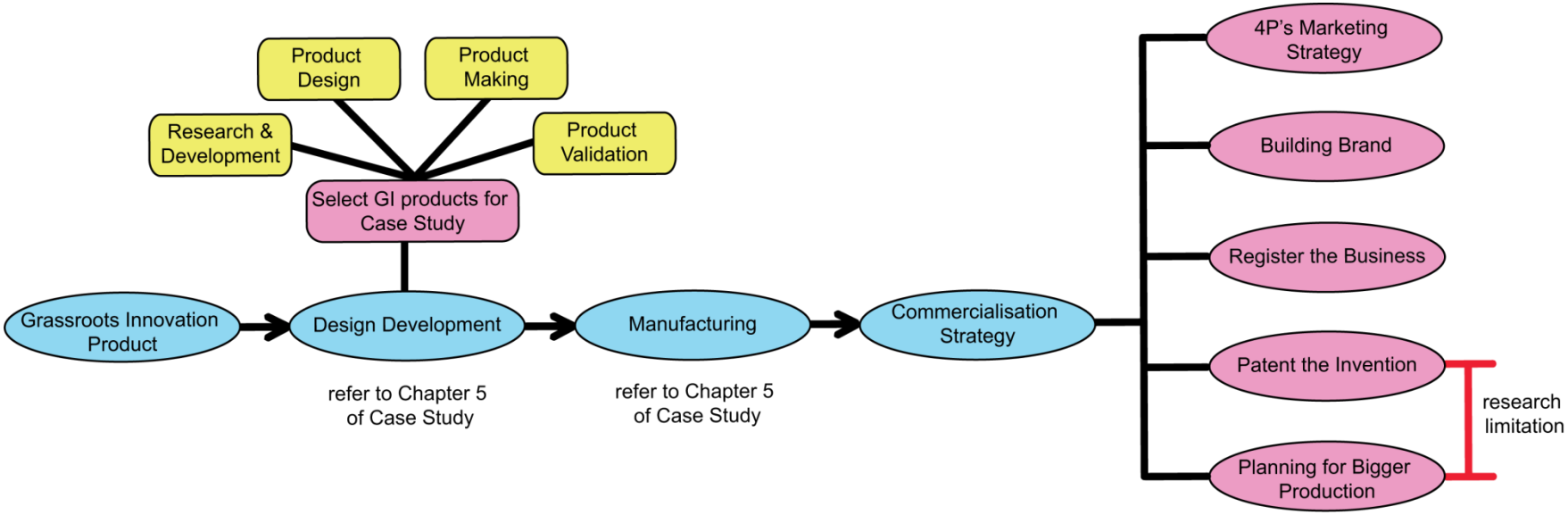


Figure 5.16: Mangement Strategy in Commercialising the Grassroots Innovation Product

5.3.4 Proposed Commercialisation Strategy

The results from the interviews conducted on the Commercialisation Strategy of GI products was concluded on Figure 5.16 (Refer to Figure 5.16 on Management Strategy in Commercialising the Grassroots Innovation Product). The figure was based on the case study product from luffa fiber.

The management process of GI start by identifying the GI product that has potential for commercialisation. The design process for GI product need to accomplish certain purpose and based on the PDS as required by user too. According to Kosim Miardi, the most important process that needs to be considered in before the commercialisation of the produsts are to ensure that the products are in good quality by confirming that the design of products is acceptable and in accurate measurements (Appendix 13).

For the phase of design development, inventors need to be equipped with the guideline in creating the best design. As stated by Dr Mahani, to make the products saleable it is important to inventor to study the user needs or requirement for the products (Appendix 13). Design process needs to take into account on recent design and colours, doing sketches to find out the best suitable design and applied the ergonomic characteristics of the design.

The phase after completing the design development is phase of manufacturing product. Accurate measurement and size are applied to the real product. Proper tools and machine were used to build the final product. Usually end products were built based on the prototype. Through building prototype process, the appearance of the end product could be identified. The final process of manufacturing product was the process of doing finishing to add aesthetic value to the product.

Inventors were encouraged to introduce their product into market through social media. Social media has become the great market place recently. The Facebook and Instagram

is the type of apps that could be used to promote the product without any investment of money.

To enter the market, design manager needs to equip their business with the 4P's marketing strategy. 4P's marketing strategy comprise of product, place, price, and promotion. The first P's is known as product. The GI product needs to stress out the uniqueness of the product to compete with existing products. The second P's is the consideration on place to market the product. Nowadays, selling through online could be the best way to inform consumers of the product. The example of suitable social media are Instagram and Facebook. The third P's is considering the price for the product. Pricing strategies comprise of the cost of material, machine and the cost of hiring workers. The forth P's is doing promotion through advertisement, social media and distributing flyers to give a customer brief idea about the product.

When the product are stable, design manager or inventor needs to build brands for their product to give identity to their product. Customers could build trust on the product quality through branding of the product. Powerful brand equity could effect in the fulfilment of above-normal product-market returns (Zemlickiene & Maditinos, 2012)

The next strategy in developing the cottage entrepreneurial of GI product is to register their business under the ROB (Registrar of Business). Through registration under ROB, the business could be fully recognise and are able to spread to wider areas of potential market.

5.4 Summary

Through the product development for case study, researcher could experience the design management process for GI products. The case study done in producing four types of products made from luffa fiber comprise of shower sponge, oven mitt, dish washing sponge

and bottle brush. The management process of GI products are further explain. The product from case study had been used for further research on commercialisation strategy of GI products.

CHAPTER 6

CONCLUSION

Overview

This chapter summarises the whole research by including the research achievement, the limitation of this research and the recommendations for further research.

6.0 Discussion

Discussion is the phase of verifying the limitation of this research and the suggestion that should be done for further research. Limitation of research discussed the accomplishment state of research area. The limitation occurred due to the restricted knowledge and the fixed period of doing the research. The planning for further research will determine the further possible study that could be taken into consideration for the improvement of the study.

6.1 Research Output

The data analysis for validation on Commercialisation Strategy of Grassroots Innovation that has Potentials for Commercialisation (Appendix 15) has proven that grassroots inventors has lack of knowledge in managing and commercialising their products. The research on GI products with potential for commercialisation create a new knowledge on commercialisation management strategy of GI products. The people that might gain benefits from this research are the people dealing with GI activities such as the grassroots communities, grassroots inventor and GI manager. The lack of knowledge in managing design for commercialisation and in creating a good design could be regenerated through the guideline achieve from this research.

6.2 Research Achievement

The four objectives that have been achieved through this research are:

1. The current commercialisation management process of GI has been verified. The grassroots communities do not have a proper management process on managing their GI products. Their main purpose of inventing the GI products is just to nurture inventor creative ideas as well as to fulfil their needs, but most of their invention is done without considering the main approach of doing design.
2. The commercial potential of selected GI products had been identified. The GI has been a demand for many people due to the simple and easy approach to solve existing problems. The GI products are proven to have a lot of potential to be commercialised.
3. The design of potential GI product for commercialisation have been developed through case study. The new commercialisation management process for managing GI product have been created.
4. The new commercialisation management strategy for GI products have been validated through the validation study. Grassroots communities and inventor had verified their approval to adapt the new commercialisation strategy for their products.

6.2 Limitations of Research

Research are limited to two phases of commercialisation strategies of patenting the invention and planning for bigger production of GI products. A patent is a limited needs given by the country to inventing and allowing the inventor to prevent others from producing, using or market the individual invention in that country during the period of the patent (Hadzima, 1994-2005). Patent are only supplied to the individual inventor (Hadzima, 1994-2005). Patent of invention is important to claim originality of the design. Meanwhile, the planning for

bigger production are the ways of introducing the business into a wider market. Things that need to be considered in planning for bigger market are the source of material, list of suppliers to build products, factory to conduct the manufacturing process, continuous research on improving the design and the scan of macro and micro environment. Research are limited to these two areas due to the limitation on financial of the grassroots communities as the application for patent and preparing for bigger production needs a large amounts of money. Moreover, knowledgeable approach is needed to for the application of the patent.

6.4 Recommendations for Future Research

There are many GI products that had the potential to be commercialised. The knowledge and skill of the grassroots community need to be improved and utilised. Suggestion for future research strategy was to organise a workshop to educate grassroots communities with commercialisation strategy of GI. Verification of product costing, giving educative approach on intellectual property, and preparation for the bigger business approach are consider to be the part of future of research. GI is a large topic to be studied as there are a lot of knowledge could be discovered on GI.

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APPENDICES

Appendix 1: Definition of Grassroots Innovation

1. GI emerge when existing systems and practices fail to serve people's needs (Gupta, 2013).

2. GI arise through serendipity, systematic experimentation, trial and error, or combining solutions in new ways (Gupta, 2013).

3. GI are innovative products or process created at the bottom of the pyramid, usually due to necessity, hardship and challenges (Mohd Faiz, 2012).

4. Innovative activities of improving products, techniques and crafts in a random and extensive way by the grassroots people who have grasped the corresponding techniques and skills. (Hua, Jiang, & Lin, 2011).

5. GI includes not only the individual innovation among the individual folks, but also the collective innovation by private research institutions and private enterprises (Li et al, n.d.).

6. Analogue innovation – Innovation emerge when an idea in one field is applied in a totally different field (Gupta, 2013).

7. Most of these innovations are from the hands of workers and farmers who are directly engaged in production activity (Hua, Jiang, & Lin, 2011).

8. What behind GI is cultural atmosphere of innovation, the soil for innovation, the exploratory spirit and the enthusiasm for creation. (Hua, Jiang, & Lin, 2011).

9. Grassroots innovations are community-led solutions for sustainability. They can offer promising new ideas and practices, but often struggle to scale up and spread beyond small niches. (Smith & Seyfang, 2012).

10. We understand 'grassroots innovations' as follows : ('Yayasan Inovasi Malaysia/ Malaysian foundation for innovation – explore innovation in industries', n.d.).

I) Grassroots initiatives are innovative networks of activists and organisations that lead bottom-up solutions for sustainable development; solutions that respond to the local situation

and the interests and values of the communities involved. In contrast to conventional, incremental green reforms, grassroots initiatives seek to practice deeper, alternative forms of sustainable development.

II) The initiatives involve committed activists who often seek to experiment with social innovations as well as using greener technologies and techniques in areas such as housing, renewable energy, food, and alternative money. They frequently seek to create new social institutions and 'systems of provision' based upon different values to those of the mainstream. Examples include community renewable energy initiatives, eco-housing, local organic food schemes, and community currencies such as time banks.

11. GI is an explicitly normative agenda, which seeks to mobilise distinctly political processes, such as claims to social justice, and often questions organisational and economic assumptions in conventional innovation policies (Smith et al., 2014).

12. Grassroots innovations develop through networks of activists, practitioners and organisations generating novel, bottom-up solutions for sustainable development solutions that respond to the local situation and communities' knowledge, interests and values. Grassroots innovation can be viewed from three distinct perspectives, each focusing on a different part of the process.

The local ingenuity perspective focuses on innovations from local groups or individual inventors. They might be farmers developing irrigation systems [1], or drivers developing gear trains for their cycle rickshaws [2]. The emphasis is on people innovating for themselves and their community, perhaps drawing upon traditional and indigenous knowledge, and occasionally turning it into social enterprise, sometimes with outside help (*http://www.scidev.net/global/icts/feature/supporting-grassroots-innovation-facts-and-figures-1.html*).

13. The term "grassroot" here refers to the masses, and it includes villagers and rural folks. As a matter of fact, there is a wealth of innovation at this level, if one cares to observe carefully. If properly nurtured, there can be an explosion of innovation by the people, of the people and for the people! ('Yayasan Inovasi Malaysia/ Malaysian foundation for innovation – explore innovation in industries', n.d.).

Conclusion and new definition :

GI is the process of improving grassroots products to be enhanced in functionality and appearance.

Grassroots Innovations occurred due to study on problems of existing products and the needs for new innovation. The process and activities of developing new products are done by grassroots community.

Appendix 2: List of GI by Lekem Anak Toseng
Inventor: Lekem Anak Toseng
Type of Products: Product made from wood

No	Product	Function
1	 Ashtrays 1	To keep cigarette ash
2	 Ashtrays 2	To keep cigarette ash
3	 Wood Mortar (big)	Cooking tool
4	 Chopping Board	To chop meat, fruits and vegetables
5	 Wood Mortar (small)	Cooking tool

Material

No	Product	Function
1	 Tree Trunk	Product material
2	 Wood	Product material

Working Tool

No	Products	Function
1	 Hand tools	Tool
2	 Carving Tools	To carve out wood

Appendix 3: List on GI by Sidek Anak Toseng
Inventor: Sidek Anak Toseng

No	Product	Function
1	 Hen Shape Decorative Basket	To keep small items
2	 Round Shape Storage	To keep small items
3	 Square Shape Storage	To keep small items

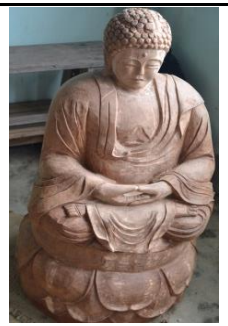
No	Product	Function
4	 Collection of Small Storage	To keep small items
5	 Vase	Flower vase
6	 Wooden Plate 1	Decorative plate

Inventor: Sidek Anak Toseng

No	Product	Function
7	 Wooden Plate 2	Decorative plate
8	 *Kompang* Structure	Musical instrument
9	 Decorative Tools	For decoration

No	Product	Function
10	 *Tongkat*	For people with walking diasability
11	 Ladle	Cooking utensil
12	 Decorative Ceiling Plaster	Ceiling decoration

Inventor: Sidek Anak Toseng

No	Product	Function
13	 Mini Guitar	Decoration
14	 Buddha Statue	Prayer Statue for the Buddhist
15	 Table	Use as a table

No	Product	Function
16	 Prayer Altar	Prayer tool for the Catholic
17	 Bidayuh's Man Traditional Costume	Traditional Costume
18	 Picture Frame	To keep picture

Material

No	Product	Function
1	 Plaster Powder	Product material
2	 Woods	Product material

Working Tool

No	Product	Function
1	 Wood Working Tools	Tool
2	 Plaster Working Tools	Tool

Appendix 4: Product sold by Kosim Miardi
Entrepreneur: Mr Kosim Miardi

No	Product	Function
1	 Ladle 1	Cooking utensil
2	 Ladle 2	Cooking utensil
3	 Ladle 3	Cooking utensil

No	Product	Function
4	 *Rehal*	Quran stand
5	 Boat Rower	To rower the boat on water
6	 Stick / *Tongkat*	Tool for disable people

No	Product	Function
7	 Wood Mortar	Cooking tool
8	 ***Senduk / Sudip Kayu***	Cooking utensil

Appendix 5: Product Sold by Tasiana

Entrpreneur: Madam Tasiana

No	Product	Function
1	 Baby Chair	Chair

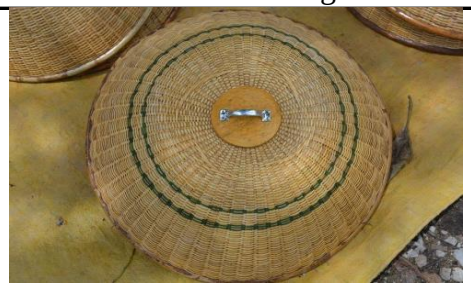
No	Product	Function
2	 Rattan Mat	Mat
3	 Clay Mortar (small)	Cooking tool
4	 Basket	To keep items

Appendix 6: Serikin Market Products

No	Product	Function
1	 Winnow 1	Tool
2	 Winnow 2	Tool
3	 Luffa Fiber	Washing Sponge

No	Product	Function
4	 Stone Mortar (small)	Cooking tool
5	 Fish Trap	To trap fish
6	 Rattan Rack	To keep items

No	Product	Function
7	 Easy Chair	Chair
8	 Basket	To keep items
9	 Baby Cot	Bed

No	Product	Function
10	 Seramic Vase	Flower vase
11	 Seramic Casing	Item casing
12	 Food Cover	Cooking tool

Appendix 7: Product on Malaysia Handicraft Promotion

No	Product	Function
1	 Basket	To keep items
2	 Card Holder	To keep card
3	 Table Lamp	Lamp

No	Product	Function
4	 Tissue Casing	To keep items
5	 Basket	To keep items
6	 Purse & Handbag	Woman accessories

No	Product	Function
7	 Tissue Casing	To keep tissue
8	 Food Cover	To cover the food

Appendix 8: Questionnaire on Grassroots Innovation (BI version)

Research Title: **The Management Process of Grassroots Innovation that has Potentials for Commercialisation**

The questionnaire was distributed for the purpose of collecting data and respondents view on Grassroots Innovation (GI). Grassroots Innovation products are new or developing products. Every analysis will be used to identify the management process of grassroots innovation that had potential for commercialization. Every information gain through the research will be used only for the purpose of the research and should never be used for other purpose. We appreciate your cooperation.

TERMINOLOGY

I) Management process – Managing the process of creating designs or planning the process of creating designs

II) Grassroots Innovation (GI) – Grassroots Innovations occurred due to study on problems of existing products and the needs for new innovation. The process and activities of developing new products are done by the community and expertise.

Example of existing GI products is wearable product, daily use product, material, food and services

Product: Clutch Made From Used Footwear
Category: Wearable Product

Product: Recycled Tire Rubber Footwear
Category: Wearable Product

Product: Multipurpose Load Carrier for Laborer
Category: Daily Use Product

Product: Sago Bark Boxes
Category: Material

Product: 'Dabai' Fruit Paste
Category: Food

Product: Ingenious Method to Move a Boat
Category: Service

Researcher: Barbara Dieo
Matric No: 14020089
Institution: Institute of Design and Innovation (INDI), UNIMAS
Supervisor: Dr Muhammad Firdaus Abong Abdullah

These questionnaires are divided into 4 parts.
Part A: Respondent's Background
Part B: Understanding on Grassroots Innovation
Part C: Respondent's Opinion
Part D: The Importance of Processes that Need to be Considered in the Context of Managing Grassroots Innovations

Part A: Respondent's Background
Instructi: : Please tick (/) your answer

Are you a user of any Grassroots Innovation products? ☐ Yes ☐ No

Part B: Understanding on Grassroots Innovation
Instruction: Please circle (O) your best answer

	Strongly Agree	Agree	Neutral	Disagree	Totally Disagree
1. Grassroots innovation products are invented to solve the problems faced by people	5	4	3	2	1
2. The use of technology is important in the process of making the grassroots innovation products	5	4	3	2	1
3. Invention of grassroots innovation products done by grassroots community has a lot of potential to be commercialized	5	4	3	2	1

Part C: Respondent's Opinion
Instruction: Please circle (O) your best answer

	Strongly Agree	Agree	Neutral	Disagree	Totally Disagree
1. Improving on the existing grassroots innovation products	5	4	3	2	1
2. Grassroots Innovation product updated with technologies	5	4	3	2	1
3. Grassroots Innovation product, multifunctional / multipurpose	5	4	3	2	1
4. Grassroots Innovation product aesthetically pleasing	5	4	3	2	1
5. The participation of professional and expert (eg: designer, engineer, businessman) in the development of grassroots innovation to give extra knowledge and enhancement of value added features	5	4	3	2	1
6. The training, workshop and activities done by organizations to help the grassroots communities	5	4	3	2	1

Part D: The importance of processes that need to be considered in the context of managing Grassroots Innovation
Instruction: Please circle (O) your best answer

	Very Important	Important	Neutral	Not Important	Totally Not Important
1. Comprehensive fundamental research to innovate grassroots innovation products	5	4	3	2	1
2. The process of identifying the others needs of the existing product	5	4	3	2	1
3. The process of identifying the needs of the new grassroots innovation product	5	4	3	2	1
4. The process of designing the new grassroots innovation product	5	4	3	2	1
5. The process of developing and improving the prototype of the new grassroots innovation product	5	4	3	2	1
6. Process of manufacturing the grassroots innovation product	5	4	3	2	1
7. The process of validate / testing the grassroots innovation product	5	4	3	2	1
8. Commercialization study of grassroots innovation	5	4	3	2	1

Appendix 9: Questionnaire on Grassroots Innovation (BM version)

Tajuk Penyelidikan : **Pengurusan Inovasi Akar Umbi yang Berpotensi untuk Dikomersialkan**

Pengedaran borang soal selidik ini adalah untuk mengumpul data-data dan pandangan pengguna mengenai inovasi akar umbi. Produk inovasi akar umbi merupakan produk tradisional yang menjalani proses pengubahsuaian dan penambahbaikan. Hasil dapatan kajian akan digunakan untuk mengenal pasti proses pengurusan inovasi akar umbi bagi produk akar umbi yang mempunyai potensi untuk dikomersialkan. Segala maklumat yang diperoleh daripada kajian ini hanya digunakan untuk tujuan kajian dan tidak seharusnya digunakan untuk tujuan lain. Segala kerjasama yang diberikan sangat dihargai.

Terminologi

Proses Pengurusan – Proses pengurusan bagi menghasilkan reka bentuk atau proses merancang dalam menghasilkan reka bentuk

Inovasi Akar Umbi – Inovasi Akar Umbi wujud hasil daripada penyelidikan berkenaan masalah produk sedia ada dan keperluan untuk sesuatu inovasi. Proses dan aktiviti penghasilan produk baru dijalankan oleh komuniti dan pakar dalam bidang berkenaan.

Produk inovasi akar umbi terdiri daripada produk boleh dipakai, produk kegunaan harian, material, makanan dan servis.

Produk : Produk Kraftangan dari Kasut Terbuang
Kategori : Produk Boleh Dipakai

Produk : Kasut Daripada Tayar Kitar Semula
Kategori : Produk Boleh Dipakai

Produk : Alat Mengangkat Bebanan Serbaguna untuk Pekerja
Kategori : Produk Kegunaan Harian

Produk : Bungkusan daripada Pokok Sagu
Kategori : Material

Produk : Perasa Dabai Sarawak
Kategori : Makanan

Produk : Kaedah Mudah Angkat Kapal
Kategori : Servis

Penyelidik : Barbara Dieo
No Matrik : 14020089
Institusi : Institut Reka Bentuk dan Inovasi (INDI), UNIMAS
Penyelia : Dr Muhammad Firdaus Abong Abdullah

Soal selidik ini dibahagikan kepada 4 bahagian
Bahagian A : Latar Belakang Responden
Bahagian B : Kefahaman Mengenai Inovasi Akar Umbi
Bahagian C : Pandangan Responden
Bahagian D : Kepentingan proses-proses yang perlu diambil kira dalam menguruskan Inovasi Akar Umbi

Bahagian A : Latar Belakang Responden
Arahan : Sila tandakan (*/*) pada jawapan anda

Pengguna produk inovasi akar umbi ☐ Ya ☐ Tidak

Bahagian B : Kefahaman Mengenai Inovasi Akar Umbi
Arahan : Sila bulatkan (O) jawapan anda

	Sangat Setuju	Setuju	Natural	Tidak Setuju	Sangat Tidak setuju
1. Produk inovasi akar umbi dicipta bagi menyelesaikan masalah harian yang dihadapi masyarakat	5	4	3	2	1
2. Penggunaan peralatan berteknologi tinggi dalam proses menghasilkan produk inovasi akar umbi	5	4	3	2	1
3. Inovasi akar umbi ciptaan komuniti akar umbi mempunyai potensi untuk dikomersialkan	5	4	3	2	1

Bahagian C : Pandangan Responden
Arahan : Sila bulatkan (O) jawapan anda

	Sangat Setuju	Setuju	Natural	Tidak Setuju	Sangat Tidak setuju
1. Penambahbaikan dilakukan pada produk inovasi akar umbi sedia ada	5	4	3	2	1
2. Produk inovasi akar umbi diperbaharui dengan teknologi	5	4	3	2	1
3. Produk inovasi akar umbi dilengkapi dengan fungsi / kegunaan yang pelbagai	5	4	3	2	1
4. Produk inovasi akar umbi dengan rupa bentuk (estatik) yang menarik	5	4	3	2	1
5. Penglibatan pakar dan golongan professional (pereka, jurutera produk, usahawan) dalam memberikan pengetahuan bagi menghasilkan produk inovasi akar umbi	5	4	3	2	1
6. Latihan, bengkel inovasi, dan pelbagai aktiviti yang dianjurkan oleh organisasi tempatan berguna kepada komuniti akar umbi.	5	4	3	2	1

Bahagian D : Kepentingan proses-proses yang perlu diambil kira dalam menguruskan Inovasi Akar Umbi
Arahan : Sila bulatkan (O) jawapan anda

	Sangat Penting	Penting	Natural	Tidak Penting	Sangat Tidak Penting
1. Penyelidikan / kajian komprehensif dalam penghasilan produk inovasi akar umbi yang berpotensi untuk dikomersialkan.	5	4	3	2	1
2. Proses mengenal pasti penambahbaikan yang perlu dilakukan pada produk akar umbi sedia ada	5	4	3	2	1
3. Proses mengenal pasti keperluan pada produk inovasi akar umbi	5	4	3	2	1
4. Proses mereka bentuk produk inovasi akar umbi	5	4	3	2	1
5. Proses mengembangkan dan menambahbaik prototaip produk inovasi akar umbi	5	4	3	2	1
6. Proses menghasilkan produk inovasi akar umbi	5	4	3	2	1
7. Proses membuat validasi / menguji produk inovasi akar umbi	5	4	3	2	1
8. Kajian komersial mengenai produk inovasi akar umbi	5	4	3	2	1

Appendix 10: Interview Questions on Grassroots Innovation

1. The purpose of creating the Grassroots Innovation (GI) products?
2. Does the GI products has high demand for commercialisation?
3. Does the existing GI products need to be improved?
4. What are the processes involved in developing the GI products?
5. What is the most important process that needs to be considered before the commercialisation of the products?
6. What are the problems that occur in dealing with the GI products?

Appendix 11: Questions on Commercialisation Strategy of Grassroots Innovation

Researcher : Barbara Anak Dieo
(Institute of Design and Innovation, UNIMAS)
Supervisor : Dr Mohd Firdaus Abong Abdullah

Research Title : The Management Process of Grassroots Innovation that has Potentials for Commercialisation

Grassroots Innovation Definition: Grassroots Innovations (GI) occurred due to study on problems of existing products and the needs for new innovation. The process and activities of developing new products are made by the community and expertise.

The research is done for the purpose of creating the best management process of Grassroots Innovation. The management process involves are identified the potential GI products for commercialisation, develop the potential GI products, manufacturing the potential GI products, introducing the potential GI products into the market and gain income through the selling of the potential products.

Type of grassroots material developed into new products

Raw Luffa

Compress Raw Luffa

Type of GI products to be commercialised: Products from raw Luffa Fiber

Strategy Idea:
Developing / Innovate the raw Luffa (grassroots product) into a new product

I. Shower Sponge
II. Oven Mitt / Glove
III. Dishwashing Sponge
IV. Bottle Cleaning Brush

Source of Material: Farmer, villagers people

Potential Customer: Women or man doing house chores, people who used shower sponge

Types of products made from luffa fiber

I 	II 
III 	IV 

Questions

From the Expert point of view

1. What is the appropriate commercialisation strategy for the GI products? (Shower Sponge, Oven Mitt / Glove, Dishwashing Sponge & Bottle Cleaning Brush)?

2. How to introduce the new GI product into market / market entry strategy?

i) Target market

ii) Pricing Strategy

3. How to confirm that the product fills the need and has a competitive advantages?

4. What are the knowledge required to formulate the commercialisation plans?

Thank You

Appendix 12: Questions on Validation of The Management Process of Grassroots Innovation that Has Potentials for Commercialisation (based on case study).

GI product for case study: Luffa fiber

Type of innovative products: Product based on luffa fiber

I) Shower Sponge

II) Oven Mitt

III) Dishwashing Sponge

IV) Bottle Brush

1. Does the new products made from luffa fiber saleable?

2. If the luffa fiber is made into various kind of product for example the shower sponge, oven mitt, dishwashing sponge and bottle brush would you willing to bought and used it or would you prefer the luffa fiber in its original form?

3. Would you willing to pioneer the commercialisation of the new luffa products?

Questions on Commercialisation Strategy

(based on the new commercialisation strategy of GI)

1. Application of 4P's marketing strategy
   - Product
   - Place
   - Price
   - Promotion

2. Did you have any plan in building brands for the products?

3. Have you planned to register your business?

4. Further commercialisation suggestion
   - Patent the invention
   - Planning for bigger production

Appendix 13: Interview on Grassroots Innovation Data

Respondent 1

Name: Kosim Miardi

Home town: Jakarta, Indonesia

Experience: 7 years

Career: Entrepreneur of products made from coconut shell at Serikin, Sarawak

1. The purpose of creating the Grassroots Innovation (GI) products?

   To fulfill the household needs.

2. Does the GI products has high demand for commercialisation?

   There is a demand for GI products, but not so much. The demand are on different kind of GI products.

3. Does the existing GI products need to be improved?

   No, because they are perfectly created. There is no change needed on the present product.

4. What are the processes involved in developing the GI products?

   Drawing or sketching process, the measuring process, choosing material, product making, validation process for the product, and marketing process.

5. What is the most important process that needs to be considered before the commercialisation of the products?

   To ensure that the products are good in quality by confirming that the design of the products is acceptable and the measurement is qualified.

6. What are the problems that occur in dealing with the GI products?

   No suitable machine to build products.

Respondent 2

Name: Tasiana

Home town: Bau, Sarawak

Experience: 8 years

Career: Selling traditional products

1. The purpose of creating the Grassroots Innovation (GI) products?

   To fulfill the needs.

2. Does the GI products has high demand for commercialisation?

   Yes. For example the *bemban* mat.

3. Does the existing GI products need to be improved?

   Bemban mat- No, because of the good quality. The other product need to be improved based on customer requirement.

4. What are the processes involved in developing the GI products?

   The measurement of the product needs to be accurate, based on the desired size.

5. What is the most important process that needs to be considered before the commercialisation of the products?

   Bemban mat- the quality of the material; quality of rattan, tree bark and the thickness of the material need to be more long lasting and more expensive in price.

6. What are the problems that occur in dealing with the GI products?

   Difficulties in finding the best material, for example the mountain rattan is difficult to be found and rope for making mat has been rarely found.

Respondent 3

Name: Nur Ain Atikah bt Mohd Razaludin

Status: Design student of UNIMAS

Product: GI product designer (Clutch made from Used Footwear)

1. The purpose of creating the Grassroots Innovation (GI) products?

   To reuse and gain benefits of the used items.

2. Does the GI products has high demand for commercialisation?

   Yes. As it is unique, limited or difficult to be found and the colours are attractive.

3. Does the existing GI products need to be improved?

   No, because of the good quality. The product need to fulfill the requirement of customer and user.

4. What are the processes involved in developing the GI products?

   Looking for material, cleaning the material, developing the design based on references (types of bag and shoes, drawing and sketches, measuring), sewing process and material validation process (find out the durability of the shoes material through customer opinion).

5. What is the most important process that needs to be considered before the commercialisation of the products?

   Cleaning or washing process of the product material, using Dettol and anti-bacterial liquid, and the sewing process to ensure the quality of stitches for the end product.

6. What are the problems that occur in dealing with the GI products?

   Limited material of the shoes, as not all parts of the shoes could be reused to make as a new product.

Respondent 4

Respondent's Name: Mr Lekem Anak Toseng

Address: Kg Tematu, Kuching, Sarawak

Experience: 4-5 years

Occupation: Farmer

His interest in making the product come from his own desire to nurture his creative ideas. He has interest in doing it after watching his brother doing the crafts work. He has made the invention activity as a part of his hobby.

Problems Face:

1. Having time limitation as he's working as a farmer
2. Lack of knowledge on fixing the price, long period of time needed to build the product and finding the suitable type of material for making the product.

Material Source:

1. Buying the material from other people
2. Material from jungle; forest wood

Type of Material used

1. *Belian*
2. *Jelutong* – carving
3. *Tebedak*

Respondent 5

Respondent's Name: Wilson Sidek ak Toseng

Address : Kg Tematu, Kuching Sarawak

Experience: 22 years (gain a lot of experience through his job as a carver)

Occupation: General Worker for Kawi Enterprise

The most important part in building grassroots innovation products is doing accurate measurement

The problem occurs when building the product:

Product Material – certain type of woods easily broken, would easily change in size

Type of Material used

1. Loan
2. *Nyatuh*
3. *Pelait*
4. *Jelutong* (very light wood)

Appendix 14: Interview on Commercialisation Strategy of Grassroots Innovation

Respondent: Dr Mahani Mohamad Abdu Shakur

Lecturer at Department of Business and Management

Faculty of Economic and Business

Universiti Malaysia Sarawak

1. What is the appropriate commercialisation strategy for the new GI products?

(Shower Sponge, Oven Mitt/Glove, Dishwashing Sponge & Bottle Cleaning Brush)

a) Know the target market – People in needs; for example female, tourist, people who are looking for organic products & wanted to go greener and ordinary people that choose other alternative to use the product.

b) Pricing Strategy – 4P's Marketing Mix Strategy

I) Product: uniqueness of products as selling point

- Highlight the goodness of the product, for example made from organic material and helping the farmers by buying their products

II) Place: market to distribute the product

- Start to experiment with commercialisation strategy through selling on Instagram; sell it ourself or through intermediaries and sell to the foreigners (demand for the higher quality of the products increase)

III) People: people as target market

- Product for kitchen used mostly by woman, target group are female and male who used to be in the kitchen

IV) Promotion: ways to promote using existing media or by spending money for promotion

c) Costing of producing the product

- Cost for asset including machine to be consider in financial management (variable cost, fix cost). Pricing strategy by consider the cost of making product, hiring workers and shop commission.
- Organic product normally expensive due to the benefits gain from using it and the uniqueness of the material.
- For bigger production, product price are charge by considering the cost for materials, compress machine, heavy duty sewing machine and maintanance on getting the consistent supply for the material used. For bigger production, ways to meet the demand are consider.

2. How to introduce the product into market/ market entry strategy?

   Using technology to market the product through Facebook and Instagram. Learn photography techniques to promote online. For postage purpose, state the price clearly. Registered the business as company will feel safer to deal with the business. Produce the products based on demand. When the demand increase, consider to have factory and manpower.

3. How to confirm the products fix the needs and had competitive advantages?

   - Highlight the competitive advantage; how to maintain and perform above the average of other products? How people look at the products?
   - Make the products saleable by finding out the most recent colours that consumer prefer. Highlight the unique features of the products. Focus on the quality by identified the feature that make the product different from other product.

- Competitive advantages can only be confirm when the product enter the market. Important ways to retain the competitive advantage are by branding the product with generic brand and patent the product. Registration of brand to claim the ownership of the brand and patent the product to protect the copyright of the product design.

4. What are the knowledge required to formulate the commercialisation plan?
    - Doing market survey for planning of production. Plan how to get the material and give people choices of colours. Consideration of the colour used to suit the purpose or use of the products.
    - Scan the environment - macro environment and micro environment. Test the market for the products by selling the products to look for the demand. Keep doing research on designing and identify the process of producing the products.
    - Get some ideas and tips on how to sale the product online. Identified how do they get their supplier and how do they manage with customer order. Branding the product to associate the product with the brand. When people buy, they buy the brands too. Promotion for products need to be properly plan. Promote according to psychological needs of the particular group that may bring psychological impact to them.

Respondent: Mr Razip Asaruddin

Researcher of Virgin Coconut Oil (VCO) product for 10 years

Senior Lecturer of Faculty of Resource Science and Technology, UNIMAS

Mr Razip was doing a research on formulation of VCO product. VCO process of extraction not involve any heat. VCO is also extracted by cold compression of fresh dried coconut meat. As ordinary oil is refined and left with the content of fatty acids in it, VCO are as clear as water. Its colour vary slightly depending on its processing. VCO had been known thousand of years ago on ayurvedic (since before century) and had been used for medication in India. UNIMAS researcher had create a VCO product with no more oil characteristic. Lauryn VCO emulsion by Mr Razip could be consume by added it into our drink, such as coffee, milo, tea and etc. The series of Lauryn VCO products are emulsion, solid VCO for skin remedy with the anti-bac characteristic, scrub to cure skin problems, hair tonic, lip balm and etc.

1. What is your main purpose of doing the study on grassroots product of VCO?

   To apply the well-known benefits of VCO. VCO has a lot of benefits for health and leaves no negative side effect. Intake of VCO could increase the immunisation, IQ level, the metabolism rate and High Density Liver protein (HDL) on the body. VCO could cure the skin problem such as irritation and burnt as it formulates to soothe the skin and could reduce the weight. VCO has a lot of benefits if consumed every day.

2. What are the processes involved in managing the commercialisation process of Virgin Coconut Oil products?

   Existing VCO is used to create product by formulate the existing VCO. Formulation process is the process of mixing something to create an emulsion, scrub, anointment, cosmetic and etc. The oily based of VCO are changing into non oily based No complicated

devices are used through the process. Packaging are done to bring each VCO products into market. Good and attractive packaging are done to meets the market standard.

3. What are the important process that needs to be considered in achieving the target?

   Focusing on developing a VCO product that are soluble in water (product feature that attract people to consume it). VCO are processes into product that could bring benefits for our health.

4. In commercialisation process, what is your first approach in commercialising the products?

   Promote the product via social media such as Facebook. Introduce the product to any interested firm that ask for formulation of the products. Creating good packaging as people might be attracted to the appearance of the product packaging. Ask for testimony to get feedback from the customer / user.

5. What are the problems occurs in managing the commercialisation of the VCO?

   People have lack of knowledge on VCO and having no idea of benefits gain from consuming the VCO. Malaysia produce coconut and the product could be developed into something new as VCO. The problem also occur on educate people to use VCO as a remedy and the wrong perception about VCO as a product that contain a lot of cholesterol.

Appendix 15: Data analysis on questions about Commercialisation Strategy of Grassroots Innovation that has Potentials for Commercialisation

Respondent Name: Catherine Senia Anak Jugi

Career: Entrepreneur at Perbadanan Kemajuan Kraftangan Malaysia (PPKM) Cawangan Sarawak or Malaysia Handicraft Development Corporation Sarawak Branch.

Experience: 31 years

Case Study Product Commercialisation Strategy Analysis

1. Agree that new products made from Luffa fiber are saleable. There are pros and cons of buying the product, but other product had their own pros and cons too

2. Application of marketing strategy most depend on PPKM.

Craft entrepreneur is not doing the marketing strategy

Product- Bemban done traditionally, Idea comes from a PKKM design expert

Place- PPKM Centre

Price- Depend on the material used

Promotion- Through promotion done by PKKM, through online,

3. The ideas of design come from the entrepreneur

Promotion Section doing marketing, Design Section does design, PKMM doing research on peoples tradition & lifestyle, Entrepreneur Development Section does product development, Entrepreneur making the product. Doing commercial through PKKM, grassroots communities are trained to use a machine, choosing suitable fabric, theme of products, the colour combination of products. PKMM entrepreneur usually making product from the forest resource material.

4. Discussion with designer are needed as not every design is able to be built as products

Type of product done at PKKM, tree bark, bamboo weaving, rattan basket and batik

But they had no idea on how to market it.

5. Every entrepreneur was exposed and given advice by PKKM on branding. But, entrepreneur not doing what they supposed to do. Giving identity to product through branding. Because an entrepreneur taught that the branding are not their work. Their work is making the products. Madan Senia collaboration with Lim Kok Wing student in choosing logo and brand to give trademark for his product. Experience in doing crafts through course in weaving and the important focus is gaining income from selling the products. In the year of 1985 start training with PKMM and in the year of 2004, start involving in crafts making seriously.

6. Madam Senia had registered her business with ROB (under the Bag Making Workshop category. Registering business not through PKMM. Start registering business to more deal more better. Doing payment through the account and etc.

7. Interested in giving a pattern for her design. Craft are not limited design, so difficult to be patterned. By giving pattern, the product design becomes limited. Varieties of product.

Have ideas to market the product but could not go much far by this time. Through PKKM, could promote the product into international market. If giving knowledge, through MATRADE. No expose on the market. PKKM never seen their creativity and ability. Entrepreneurs need knowledge on who to deal with. Knowledge needed by people with ability, interest and serious in doing it.

8. Planning for bigger production

Yes. Expose to widen the market. Now just doing selling through trade fair. See how the market acceptance of the product. Looking at what other country products offer. Promotion is important to expose our product and they expose our product to them. Entrepreneurship different from trading. Not enough staff, less product produce. Grassroots community no knowledge in design, colour, and skill as no knowledge given to them.

9. Pricing is taught by people

The experience taught them to be better and greater. Need to practice to experience. The technique, types of material.

About the Luffa Fiber

1. Having potential to be sold. The material needs to suit the used

2. Prefer the products going through innovation. The entrepreneur, the designer is needed. A modern innovation is needed for the market. When the people see, and the product could be going far. Further the business, material. Eg: tree bark makes into a bag for conference kit attended by a thousand people, come into the hand of a lot of people, people see and feel it. Then they know the material could be utilised into something better and they know the benefits of the material.

3. Grassroots communities have no ideas to innovate the resource, because of lack of knowledge, thinking outside the box. Sell at market to gain request. Market price depending on the design. Their focus is just to solve problems.

4. Specialise of each criteria is needed. To look for resources, product maker and marketer. Understand but not doing are not utilising the knowledge. Need someone to open the ways to enter the market. The entrepreneur sells too. Designer marketing the design. Staff to market the product needed. One company under SEDC are Sarakraf. The machine provided by PKKM. Need to have own machine too. Need people to observe, giving knowledge on doing product, active people to be serious, people giving training in doing design, escort them to the market. Free course is given by PKKM too. The talent needs to be utilised. People see their talent and they could utilise it.

Respondent’s Name: Wasadi

Age: 27 years old

Experience: 10 years

Career: Rattan Chair Maker and Seller

Rattan chair taken two days to be completed. No design is done before the making process of rattan chair. Doing validation or try the use of it before sell. Size 48-50cm wide with high 40-35cm. Looking for material by own self. No branding strategy done. No plan to branding the products. Have a plan to create bigger business. Need money. No people to deal with in furthering the business. Making product makes from rattan. No registration in doing business. Full time making rattan chair. Start from family business. Start doing since the age of 16-17 years old. Making a product based on customer request. Different design of rattan chair is produced once a year. People bought the limited design and idea too. Rattan easy to be build as products. Rattan not easily to be found. Rattan needs to look far away in the jungle. Bought from people who looking for those rattan.

Respondent’s Name: Masni, Dedi, Andika

Experience: 3 years

Career: Doing mat made from rattan and tree bark

Learn to make the product from the elders and they are the generation. Design ideas of own self. No proper drawings are done. Looking for material in the forest. Cook the bark with leaves. Making basket, rattan chair and etc. No promotion done to sell products. People come and bought. Request/ order by people. Experience around 5-6 years. Rent place to sell at Serikin. Making the design upon request by customer. Idea for design 100% from own. Price given according to the quality and design. Having planned for bigger businesses, open own place to sell. People order and help to sell. Never plan for doing pattern.

Respondent’s Name: Arif

Experience: start from 2002 (14 years)

Career: Making and selling mat

An idea comes because a lot of rattan and bark to be used. Easily to get the material. Looking own self and sometimes bought. Design idea just by looking and making it. No proper drawing. Normal size depends on the size of standard house; example living room size 6x9 feet. Smaller 5x7, 6x9, 7x10, 6x10 feet. No promotion doing to promote the product. People just look and buy. People sell until Bali. 1 mat takes a few days to be completed. Big size RM 270, 6X9 RM230. Price depends on cost to make the products and the value between ringgit and rupiah. Depend on quality of product. Quality is stress. Not registered business. No giving brand to the mat. Design the mat differently. Everyone had a different design. Plan for a bigger business, looking for workers but need money to start it. The product could lasting for 10 years. Motivated by a lot of natural sources to be utilised.

Respondent’s Name: Madam Gehem Anak Pulo

Carreer: Vegetables and Luffa products seller

Planting Luffa to be eat, but the ripe Luffa are sell to be utilise. Ripe Luffa made to shower sponge and for dishwashing use. Sell from RM5-RM7. The innovative luffa products could be sell, prefer the innovative products. Prefer to sell for people who needs it for bathing and dishwashing. Never done any proper promotion. Price depend on the market, consider other people selling price. No plan to innovate the product. just plant to be eaten. Utilise the ripe raw Luffa for business.