MALAYSIAN FOOD INDUSTRY ACCEPTANCE OF GENETICALLY MODIFIED FOOD

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Universiti Utara Malaysia
August 2016

MALAYSIAN FOOD INDUSTRY ACCEPTANCE OF GENETICALLY MODIFIED FOOD

By

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Thesis submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
in Partial Fulfillment of The Requirement for The Degree of Master

Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

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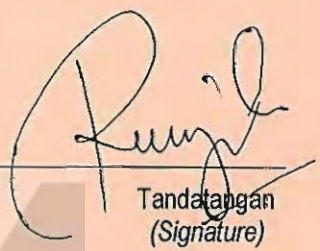
Program Pengajian *(Programme of Study)*	:	**Master of Science**
Nama Penyelia/Penyelia-penyelia *(Name of Supervisor/Supervisors)*	:	**Dr. Risyawati Mohamed Ismail**



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Abstract

The acceptance of an industry towards new technology would help them to be remained in the current competitive global market. For instance, Genetically Modified Food (GMF) is a new technology in Malaysia, also known as food biotechnology which has been produced through the modern genetic engineering method. Through the acceptance for commercializing GMF in the food production, comes many advantages for the food industry. Unfortunately, acceptance of GMF itself is an issue as portion of the food industry still prefer to accept and use non-GMF rather than GMF in their food production process. This circumstance happens due to several elements such as the strategy of the industry itself, complexity or stringency of government's regulation as well as attitude shown by the stakeholders towards the usage of GMF. Although past studies indicated industry strategy, regulation and attitude are significant in influencing industry acceptance of GMF, there has been comparatively little research which examines the relationship between these variables. In order to fill this gap, a survey was conducted on 248 processed food industries throughout Malaysia in order to examine the relationship of industry strategy, regulation and attitude on industry acceptance of GMF. In regards to Pearson correlation, the acceptance of GMF in the Malaysian food industries inherently increased due to the implementation or support of proper strategy, systematic regulatory system and positive attitude's feedback or response gained from the food manufacturers. Consequently, GMF acceptance among food industries contributed to the enhancement and development of Malaysia's economy and performance.

Keywords: Genetically Modified Food, Genetic Engineering, Food Industry, Acceptance, Malaysia

Abstrak

Penerimaan teknologi baru merupakan pemangkin kepada sesebuah industri untuk terus kekal dalam pasaran global yang kompetitif pada masa kini. Sebagai tamsilnya, makanan terubahsuai genetik (GMF) merupakan teknologi baru di Malaysia. GMF ini juga dikenali sebagai makanan bioteknologi yang telah dihasilkan melalui kaedah kejuruteraan genetik moden. Terdapat pelbagai kelebihan terhadap industri makanan yang menunjukkan penerimaan untuk mengkomersilkan GMO dalam pengeluaran makanannya. Malangnya, penerimaan GMF itu sendiri telah mencetuskan isu kerana terdapat sebahagian industri makanan yang lebih cenderung untuk menerima dan menggunakan bahan bukan GMF berbanding GMF dalam proses pengeluaran makanan industri mereka. Situasi ini berlaku disebabkan oleh beberapa elemen. Antaranya, strategi industri itu sendiri, kerumitan atau kesulitan undang-undang kerajaan dan juga sikap yang ditunjukkan oleh pihak pengeluar makanan terhadap penggunaan GMF. Walaupun kajian lepas menunjukkan strategi industri, undang-undang dan sikap merupakan perkara penting yang mempengaruhi penerimaan GMF dalam sesebuah industri, namun jumlah penyelidikan yang mengkaji hubungan antara pemboleh ubah ini masih lagi terhad. Dalam usaha untuk mengisi jurang tersebut, kajian ini telah dilaksanakan terhadap 248 industri pemprosesan makanan di seluruh Malaysia yang bertujuan mengkaji hubungan antara strategi industri, undang-undang dan sikap terhadap penerimaan GMF dalam sesebuah industri. Berdasarkan analisis korelasi Pearson, keputusan menunjukkan bahawa peningkatan penerimaan GMF dalam industri makanan di Malaysia adalah didorong oleh pelaksanaan atau sokongan daripada strategi yang bersesuaian, sistem perundangan secara sistematik dan maklum balas atau tindak balas positif yang diperolehi daripada pengeluar makanan. Oleh itu, penerimaan GMF dalam kalangan industri makanan menyumbang kepada peningkatan dan pembangunan ekonomi dan prestasi Malaysia.

Kata Kunci: Makanan Terubahsuai Genetik, Kejuruteraan Genetik, Industri Makanan, Penerimaan, Malaysia

Acknowledgement

In the name of Allah SWT, the Most Gracious and the Most Merciful, I am grateful for giving me the strength to complete this thesis. This thesis would not have been completed without the support and assistance of many people. First and foremost, my sincere gratitude and appreciation goes to my supervisor, Dr. Risyawati Mohamed Ismail for her constructive ideas, criticisms, guidance and patience throughout the duration of preparing this thesis. She has successfully guided me through some stressful times and were always willing to sharpen my understanding of this thesis and other academic writings. It was a great privilege to work under her supervision due to her professional expertise and many insightful comments had contributed tremendously in focusing my thoughts and ideas.

I would also like to thank the respondents from food companies for their invaluable help during data collection. Special thanks are extended to all the respondents who have given their cooperation in completing the survey. A note of thanks also goes to all my beloved friends : Sitti Aminah Baharudin, Lim Chang Hong, Hadiati Fitri and Monther Mohamed Youseff Aljarrah for their moral support, encouragement and great words of motivation when I seriously need someone to eat, laugh and listen on my story.

Finally and most importantly, I would like to extend my gratitude, appreciation and affection to my lovely father, Hussin Babu and my mother, Jamilah Said as well as my younger sisters, Angah, Kakak and Adik who have given me their prayers, encouragement, unfailing support, overwhelming patience and inspiration for me to go through this journey especially during the time when my health was in horrible and fully relied on my family. I am forever indebted to their never-ending love towards myself.

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List of Abbreviation

GMF	Genetically Modified Food
GMO	Genetically Modified Organism
MOH	Ministry Of Health
JAKIM	Department of Islamic Development Malaysia
HACCP	Hazard Analysis Critical Control Point
GMP	Good Manufacturing Practice
MATRADE	Malaysian External Trade Development Corporation
MARDI	Malaysian Agricultural Research and Development Institute
NRE	Natural Resources and Environment
GMAC	Genetic Modification Advisory Committee
FSQD	Food Safety and Quality Division
WHO	World Health Organization
FAO	Food & Agriculture Organization
UN	United Nations
EU	European Union
HSE	Health and Safety Executive
FSANZ	Standard Australia New Zealand
GEAC	Genetic Engineering Approval Committee
AQIS	Australian Quarantine and Inspection Service
MAFF	Ministry of Agriculture, Forestry and Fisheries
ACNFP	Advisory Committee on Novel Food and Processors
HSNO	Hazardous Substance and New Organism

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The acceptance of new technology in Malaysian industry could lead them to be remained in the current competitive global market due to complexity and continually changing environment in those industries, market liberalization, globalization, dynamic and diverse customers demand as well as increased competition pressure among the industries (Rudder, 2001; Saguy & Sirotinskaya, 2014; Stronen, 2011). In the context of this research, the focus concerns on the industry acceptance towards Genetically Modified food (GMF) as portion of new technology in the Malaysian industry's sector for the purpose to retain the loyalty of the existing customers and creating differentiation of product.

Simultaneously, the acceptance of new GMF technology among the industries would contribute to the development of Malaysia in several ways. Firstly, the industry acceptance towards GMF would help to increase the income of this nation. This circumstance happens because the industry is referred to the manufacturing sector which is being classified under one of the industry sectors that would contribute to boost up the Malaysia's income (Federation of Malaysian Manufacturers (FMM), 2014). As stated by the Economic Planning Unit of Prime Minister Department Malaysia and Department of Statistics Malaysia (2015), the manufacturing industry contributes 53.5 billion of sales revenue or 4 % annual percentage changes to Malaysia's gross domestic product (GDP) in 2014. In the same year, total merchandise export stated 58.9 billion and index of

industrial production Malaysia increased 5.2 percent. Secondly, as indicated by the Malaysian Biotechnology Information System, the industry acceptance of this new technology of GMF is not only crucial in improving Malaysia's sector of strength such as manufacturing industry. Yet, it would also enhance the new growth sector in term of medicine and food agriculture. To exemplify that, it is an ambition of Malaysia to ensure the manufacturing industry and petrochemical could be labelled as a domestic industrial base in 2015, which is directly becoming a stepping stone for Malaysia to develop the Malaysian health care sector that is aligned with the global healthcare standard (Ministry of Science Technology and Innovation (MOSTI), 2010; The National Biotechnology Division (BIOTEK), 2010). In fact, an industry acceptance towards this new technology of GMF would also beneficial to the food agriculture sector to adopt a high technology farming system and agronomic practice; which consist of proper fertilization management as well as reduce pest control utilization that may increase yield with a high of quality and profitability of the farm in food agriculture industry. Indirectly, this clearly shows that industry acceptance towards new technology of GMF will contribute to the development of various sectors in Malaysia.

In accordance with the aforementioned, an industry acceptance of GMF technology creates an opportunity for Malaysian food agriculture industry to be a potential dependence for future food security. Hence, this is matched to the aspiration of Malaysian Agriculture Ministry to enhance the food production into larger scale in order to cater with the domestic food demand and exportation purpose. Thus, this is also aligned with the vision of Prime Minister, Datuk Seri Najib Tun Razak as reported in Budget 2013. He was concerned about the manufacturing of food agriculture industry to

produce local food products without heavily relied on imported food from foreign countries (Azadi & Ho, 2010; Ernst & Young, 2011; Indrani, Siwar, Hossain, & Vijian, 2001; Kruft, 2001; Tengku Ahmad, 2015). Consequently, GMF acceptance among the food industries would help to reduce Malaysia's dependence towards external trade which will result in a decline in Malaysia's industrial production and manufacturing export.

Due to such a vital role, the industry acceptance remains as the major and imperative mechanism towards the Malaysian economy. In order to achieve a successful industry, many industries accept the new technology in their operation once they have seen the perceived benefits such as potential to be first-to-market or new-to-market in introducing the new technology instead of disseminate the value-added of new technology to the market. Hence, this circumstance could assist those industries to gain a high profit and able to survive in a long term period with another challenging industries. However, accepting new technology of GMF among the industries especially small and medium industry (SMI) tend to create a trouble due to the appearance of perceived risk such as lack of skilled-worker, insufficient financial as well as worrying about the possibility of low profit return in industry's business (Avermaete & Morgan, 2003; Avermaete, Viaene, Morgan, & Mahon, 2004; Nooteboom, 1994; Spielman, Kolady, Cavaleiri, & Rao, 2014). Thus, in order to avoid the failure cost of industry, the knowledge regarding new GMF technology should be obtained before it is being accepted by industry's operation itself. The industry should acquire the knowledge regarding customers' need, requirement and feedback, current situation and status of supplier and competitor, the capability of the

existing technology and equipment as well as profit, growth plan and production method of the industry. Besides, the acceptance of industry becomes complex due to all industries are not resemble in the aspect of ability to accept and exploit new technology in their industries (Hagedoorn, 2003; Henchion, McCarthy, Greehy, Williams, & Kavanagh, 2013; Rogers, 1995).

Moreover, the industry acceptance towards new technology such as GMF would also be complicated because of the industry itself does not have trust or belief to another related institutions. For instance, the industry hesitate or reluctant to accept and listen to the research or suggestion related to modern biotechnology of GMF provided by the university. Furthermore, while forming or conducting business through joint ventures or collaboration with other industries, the industry will not have a high level of trust and confidence to the new management, industry's operation and the practice or training provided for the existing employee by their new business partner. Nonetheless, the industry tend to show their low level of trust towards government and regulatory agencies about the source of information of accepting new technology because they did not know or notice to what extent those agencies have competency to make a right decision (Hobbs & Goddard, 2015; Lang, 2013; Sjoberg, 1999). The industry will question what is the positive respond towards their industry's value and benefit if they accept new technology of GMF?

Although there are lots of barriers would have to be faced by the industry in accepting new technology of GMF, many consensus exposed the industry acceptance could significantly associated and influenced by market dynamism which includes changes of technology, customer demand, practice of business, product advantage such as

uniqueness, capability to meet market need, variety as well as positive reputation towards industry and also channel support such as cooperation from the supplier and related retailer. Nonetheless, by accepting new technology such GMF, the industry could be long lasting with another competitive market, increased market share and new customer (Cooper & Kleinschmidt, 1987; Cui, Griffith, & Cavusgil, 2005; Haines, 2007; Lin & Chang, 2012). Hence, a research focuses on industry acceptance of GMF is deemed necessary to be carried out.

1.2 Problem Statement

The acceptance of new GMF technology contains many benefits and known as an imperative application towards food industry such as enhancing nutritional and processing features of food, providing an extensive type of product in the food production, raising up an efficiency of the food supplies and producing lower cost product as well as establishing lower production cost and product development (Bredahl, 1999; Ceccoli & Hixon, 2011; Chi-Ham, Bennett, Barrows, Sexton, & Ziberman, 2013; Ellahi, 1994; Wesseler, Scatasta, & Fall, 2011; Zilberman & Wesseler, 2014). Unfortunately, an acceptance of GMF has triggered controversy among the food industries which lead them to be reluctant and unsure whether to accept or reject the GMF usage in their food production. Therefore, this study explores the acceptance of GMF among Malaysian food manufacturers.

Simultaneously, in the context of Malaysian stakeholders which is emphasized through food manufacturers, an acceptance of GMF is still in the early stage of introduction and development to the current Malaysian market where the Food Act and regulation of GMF

were just amended and enforced by the Malaysian Ministry of Health (MOH) in the past few years (Fauziah, 2011; Lim, 2015). Scholars observing these challenges as caused by several reasons. First and foremost, the food industries prefer and are more acceptable to non-GMF rather than GMF due to negative attitude shown by the main player sectors such as food companies owners and top management. The acceptance of GMF among the food industries are also depending on the regulatory system such as obtaining licensing agreement and obey to the GMF procedures which has been regulated by the government. However, in order to meet those GMF regulations, the food manufacturers are facing with several risks and financial problem in formulating and restructuring their industry's strategy (Sung & Hwang, 2013). Thus, in accordance with that, it is apparent that there is a need for empirical research pertaining to GMF and Industry acceptance. To the best knowledge of the researcher, previous research on the subject, such as the acceptance behavior of an organization in regards to GMF usage is hardly ever to explore. This study looks to fill that gap in order to better explain the decision make by manufacturers in regards to GMF acceptance and usage.

1.3 Research Questions

As presented on the research background and problem statement, the main interest of this research is focused on " Is GMF accepted by the Malaysian food industry? Based on this statement, the following four research questions were enclosed to guide this research :

RQ1 – Does industry strategy have a relationship with the Malaysian food industry in accepting GMF?

RQ2 – Does regulation have a relationship with the Malaysian food industry in accepting GMF?

RQ3 – Does attitude have a relationship with the Malaysian food industry in accepting GMF?

1.4 Research Objectives

The intent of this research is to understand whether GMF is accepted by the Malaysian food industry, which is followed by aims to examine the relationship of the independent variables which consist of the attitude, industry strategy and regulation of GMF. In the context of the Malaysian industry sector, this research is conducted in order to achieve the following objectives:

i. To examine the relationship of industry strategy with industry acceptance towards GMF.
ii. To examine the relationship of regulation with industry acceptance towards GMF.
iii. To examine the relationship of attitude with industry acceptance towards GMF.

The information obtained from the Malaysian food industries was used to explain the research objectives in order to gain a deeper understanding of the research being investigated. Thus, respondents of this study were given a structured questionnaire to get their responses towards all the variables in this research.

1.5 Significance of the study

This research may have an impact on the society, economy and nation. One of the significances derived from the finding of this study is to provide in depth understanding of current manufacturers acceptance that may guide policy makers involvement related to the usage and commercialization of GMF in Malaysia. This is supported by Frewer et al. and Vermeulen (2004) which elucidated that research pertaining to GMF enables the decision makers of the industry and policy makers in the government institution in achieving the standards and requirements for introducing and commercializing GMF. Directly, this circumstance will lead the food industry and government authority to achieve an appropriate GMF market and strong strategies in the development of GMF.

Another significance that would appear from the finding of this research is to assist manufacturers which are involved in the food production to obtain proper understanding regarding the benefits in the production of GMF rather than simply apply it into the food industry (Rogers-Hayden, Mohr, & Pidgeon, 2007). Thus, based on the accurate information provided from this research, the food manufacturers could plan, execute, control and make a proper decision making related to the management of GMF in their industries. Thus, the food manufacturers will be able to handle GMF production systematically.

Furthermore, this research would also help manufacturers in the food industry to be concerned on the rules and guidelines related to GMF production that has been set up, especially for the foreign or local GMF commercialization activities (Rollin, Kennedy, & Wills, 2011). Consequently, the manufacturers manage to run the importation and

exportation activities of GMF smoothly based on the rules and regulation which have been fixed; and this circumstance will lead to a better commercializing process of GMF in their industry.

By conducting this research, the actual knowledge regarding industry acceptance feedback related to GMF could be visualized. This will provide an information on how many food industries are willing to accept and reject GMF in their business operation. In fact, by conducting this research, information regarding the actual phenomenon or status of GMF in Malaysian food industry could be obtained. Lastly, this study contributed to the literature by :

i. Providing an empirical evidence regarding the relationship between GMF and industry acceptance.

ii. Examining the perspective and acceptance of Malaysian food industry towards GMF.

1.6 Scope of the Study

The research analyzed the relationship of industry strategy, attitude and regulation on industry acceptance. Simultaneously, this research is confined in a developing country which is Malaysia. In addition, this research focused on the manufacturing sector which is emphasized on the food industries throughout Peninsular Malaysia due to its capability in providing a huge impact towards nation's economy. The chosen food industries in the context of this study comprised of all processed food industries in Malaysia. Moreover, this research also involved the manufacturers which include the managers of the food production for each of these food industries.

1.7 Definitions of Key Terms

The following terminology is adopted for this research :

1. **Genetically Modified Food (GMF)** in this research referred to any food which contained or produced through genetically engineered organism process by inserting a specific gene such as virus, bacteria, animal, or plant.

2. **Industry Acceptance (IA)** in the context of this research referred to the situation which is giving a feedback on how far the potential stakeholders are willing to adopt, accept or reject something or any new technology. The industry acceptance will be measured based on the perceived benefit, perceived risk, trust and knowledge.

3. **Industry Strategy (IS)** is described as a determination of industry's future direction by setting out the long term method or plan to ensure the production of GMF may be able to achieve the target and goal of the industry.

4. **Regulation** for this study is referred to the laws, rules, procedures and guidelines regulated by the government and related authorities to ensure either the operation of business is carried out or stopped.

5. **Attitude** is defined as an inner assumption which elucidated based on the evaluation towards particular things, ideas, objects or situations with the degree level either positive or negative, supportive or opponent response such as approve or disapprove, like or dislike, approach or avoid, attract or averse.

1.8 Organization of the Thesis

This study focused on the acceptance of GMF among the food industries in Malaysia. Subsequently, this thesis comprised of 5 chapters. First chapter explains the background of the study, problem statement, research questions, research objectives, significance of the study, scope of the study and definition of key terms. Next, chapter two emphasized on the previous literature review which explained all variables, gap and also the underpinning theory involved in this study. Thoroughly explanation of research method exhibited in chapter 3, which separated into research framework, hypotheses development, design of research, operationalization of variable, measurement of variable, procedure of data collection, sampling frame, pre-test as well as data analysis techniques. This is followed by chapter 4 which comprises of steps taken in analyzing data and complete with the result of demographic data instead of statistical result derived from the collected data. At the end, a brief review related to findings of this study presented in chapter 5. It includes discussion of the objectives in this study, theoretical and practical contributions, limitations, recommendation for future study and conclusion of this study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This research is aimed to investigate an acceptance among the Malaysian food industries towards GMF which is giving an opportunity for the food industry to be remain in the competitive market. This chapter presents a review of the relevant literature and leading to the development of the conceptual framework for this research. The focus of this review is on industry acceptance (IA), which is influenced by attitude, industry strategy (IS) as well as regulation of GMF. Moreover, previous empirical findings related to each variable will also be presented. Lastly, this chapter is concluded by the underpinning theory that matched as a foundation for this research.

2.2 Importance of GMF to the Food Supply Chain

GMF plays an imperative role in the food supply chain. The introduction of GMF helps industries related in the food supply such as manufacturers, producers, processors, caterers and other food handlers to catch up with an ever increasing food demand especially from modern consumers that looking for specific health and nutritious foods (Christoph, Bruhn & Roosen, 2008; Opara, 2003). GMF was identified as the tool that enable the alleviation of inadequate food supply system which directly create the food crisis phenomena (Jaramillo, 2009). GMF not only increases the amount of food supplied to population, but at the same time introduce better crops which are not only resistant to

crop diseases but also has more enduring shelf life. One of GMF key characteristics is it resistance to longer time which directly highlighted the importance of GMF to the food supply chain (Habibi-Najafi, 2006). In addition to that, the price offers through GMF are always lower compared to the conventionally produced food varieties (Chen, 2011).

GMF brings imperative innovation in the food sector which is directly driving the importance of food supply chain, resulting in the rapid growing of GM crops all over the world (Rodríguez-Entrena & Salazar-Ordóñez, 2013). Such trend could be seen through the increase of planting area for GM crop all over the world. James (2010) reported since 1996, the area of GM crops plantation has widely increased by 87-fold from 1.7 to 148 million hectares inclusive of 29 countries which host half of the world's entire population. Such vastness of crop plantation further implied how GMF is taking a substantial portion in the food supply chain around the world. Food derived from GM crops has increased very fast. Therefore, many industries through their governments, biotechnology companies, scientists and 14 million farmers from 25 countries support the benefits rather than the risks of GMF (James, 2010b; Starr, 1969; Mather et al., 2012). .

2.3 GMF And Malaysia's Context

GMF is a one of the products derived from the food biotechnology sector. In Malaysia, emphasized on GMF is in line with the establishment of National Biotechnology Policy (NBP) in 2005 which came in three different time related phases namely phase I (2005-2010), phase II (2011-2015) and phase III (2016-2020). In general, NBP covered nine thrusts namely healthcare, industrial, research and development (R&D), human capital development, financial infrastructure, legal and regulatory framework, strategic

development government support and commitment as well as agricultural. In the agriculture sector the main focus is on the introduction and consumption of GMF. The main aim is to ensure that the agriculture sector in Malaysia especially related to the food production and food processing would improve significantly through advance biotechnology process. In addition, through such technology, lies also the enormous potential of food exportation to other countries, seen as a prime tool in boosting up the ambition of Malaysia to become an economically accomplished nation by the year 2020 (Malaysian Science and Technology Information Centre, 2014; Ahmad et al., 2008).

Why is GMF important for Malaysia? This is mainly due to the fact that GMF is one component which emerged from the agriculture sector. The Malaysian government has put a strong emphasized on biotechnology by allocating a huge financial support for the sector. Under the Ninth Malaysia Plan (9MP), more than RM 20000 million has been allocated in the biotechnology sector by the Malaysian government. Half of the total investment was placed on amenities and another RM 463 million was allocated for research and development activities. A further RM530 million was for the business development of biotechnology. The National Biotechnology Division (BIOTEK) under the Ministry of Science, Technology and Innovation (MOSTI) has been given important responsibility of monitoring and leading all agenda related to the biotechnology sector inclusion of technology development as well as promotion of biotechnology program. This massive investment is in parallel with the direction of the New Economic Model (NEM) in which the main aim was to turn Malaysia into a high-income nation with the capability to be market leader, equipped with well-governed agencies, regionally integrated, with high level of entrepreneurial and innovative abilities.

Moreover, in illustrating the status of GMF in Malaysia, the advancement of GMF in Malaysia and worldwide have been introduced since 1998 (Amin, Jahi, & Nor, 2010). Currently, although Malaysia does not developing the nutritional value enhancement of GM rice namely golden rice as developed by the Philippines, Vietnam, India, Bangladesh, China and Indonesia, but Malaysian Agricultural Research and Development Institute (MARDI) was paying attention on developing virus-resistant transgenic rice (Amin, Azlan, Ahmad, & Ibrahim, 2011; Mayer, 2005). Furthermore, since 2000, Malaysia enthusiastically focused on developing delayed ripening papaya, GM chilli, virus-resistant chilli pepper, passion fruits, GM pomelo, GM palm oil and GM pineapple with enhanced quality (Ellis, 2006). Unfortunately, most of the GMF is still under R&D process. For instance, until today the commercialization of GMF is confined to the delayed ripening papaya and rice that have been approved by Genetic Modification Advisory Committee (GMAC) (Abu Bakar, 2007; Amin, Hashim, Sidik, Zainol, & Nurina, 2011; Christoph et al., 2008; Ellis, 2006; Ismail et al., 2012). In addition, Malaysia has received importation of GMF from other countries such as GM soybean and GM corn since 2004 to be appeared into Malaysian market (Amin, Jahi, Nor, Osman, & Mahadi, 2008; Escaler, Teng, & Powel, 2011). This clearly shows that Malaysia is extensively struggling in introducing and developing GMF at this moment.

2.4 Food Industry In Malaysia

The Malaysian food industry can be broken down into two groups of manufacturers namely manufacturing or MNC and Small and Medium Industries (SMI) (Ministry of International Trade and Industry Malaysia, 2006). The total of SMI has dominated MNC which provide RM 25 million of annual sales turnover in Malaysia (Malaysian Investment Development Authority, 2014; MyGovernment, 2015). As strengthened by Jinap (2008), there are 5,565 food manufacturers available in the Malaysian food industries at this moment.

Furthermore, the food industry providing dynamic internal and external environment as well as beneficial nation's economy. For example, Malaysian Investment Development Authority (2014) revealed that processed foods from Malaysia is exported to more than 200 countries such producing an annual export value of more than RM 13 billion. Major export destinations were Singapore, Indonesia, the United States of America (USA), Thailand and Republic of China. This giving an impact that the contribution of the food industry to the total manufacturing output has increased 7.3 percent in this year as planned during the Third Industrial Master Plan (IMP3), 2006 to 2020 (Ministry of International Trade and Industry Malaysia, 2014). Moreover, the food industry augmented 8.4 percent and caused manufacturing sector contributed 5.2 percent to Malaysia's gross domestic product (GDP) in the third quarter of 2014 (Malaysian Department of Statistic, 2014). Meanwhile, total employment in food manufacturing sector stated 644,267 persons which directly contribute 9.4 percent to the total employment towards manufacturing sector in Malaysia due to the increment employment number of food technologist, chemists and skilled workers purposely to ensure food

safety and quality is in line with the international requirement (Federation of Malaysian Manufacturers, 2014). Thus, this shows that the growth of food industry contributed to the income and development of this nation. Besides, the growth of the food production, together with an expansion of the global food industry leading to greater synergy, in terms of value-added creation, product diversification and market expansion in Malaysia.

2.5 Definition of Industry Acceptance (IA)

There are various definitions to define the acceptance as shown in table 2.1. However, previous researchers (namely Adell, 2010; Regan, Mitsopoulos, Haworth, & Young, 2002) argued that there is no standardization and clear meaning of what acceptance is otherwise, it represents different meaning across the various studies. This circumstance resembles to the IA which is being exposed that there's no exact definition to describe or interpret the meaning of IA. For the purpose of this research, the IA is defined based on the previous works of scholars such as Ausserer and Risser (2005) as well as Chang, Hwang, and Li (2007). Thus, IA is defined as the situation which is giving a feedback on how far the potential stakeholders are willing to adopt, accept or reject something or any new technology.

Table 2.1
Various definitions of IA

Author	Year	Definition
Pilgrim	1956	The consumption of object or thing which is influenced by the behaviour, criteria, reaction and assumption or perception.
Sheth	1973	The reaction or action of accepting either by passive reaction or real action to accept or reject.
Nielsen	1993	An acceptance described as a something or new technology which is adequate to fulfil the demand of the potential stakeholders.
Hosford-Dunn, Hush, & Sandlin,	2000	An acceptance derived from the term of 'accept' which is referred as a something to be accepted or rejected based on the satisfaction.
Ausserer & Risser; Chang, Hwang & Li	2005 & 2007	The situation which is giving a feedback on how far the potential stakeholders are willing to adopt, accept or reject something or any new technology.

2.5.1 Measurement of IA

As depicted in Table 2.2 below, there are many ways to measure IA of GMF. While some researchers such as Frewer et al. (1997), Verdurme and Viaene (2003), Mucci et al. (2004), and Tait and Chataway (2007) measured IA by focusing on benefit and risk of GMF, there are also some researchers such as Chen and Li (2007), Rodríguez-Entrena and Salazar-Ordóñez, (2013), and Bredahl et al. (1998) were focused on perceived benefit and perceived risk whereas, Frewer et al. (2014), as well as Frewer, Howard, and Shepherd, (1996) exposed that IA could be measured based on the perception towards risk and benefit of GMF. Thus, in the context of this study, the perceived risk and

perceived benefit will be utilized as an element of industry acceptance. Perceived benefit and perceived risk are categorized as a strongest element to measure acceptance such being indicated by Siegrist (1999, 2000) and Tanaka (2004). This is supported by Sheth (1973) and Sternquist (1994) which stated that, in order to minimize the risk for the use of GMF in food production, the expert or people whom involved in the food industries such as food manufacturers are required to concentrate on perceived benefit such as quality and desirability of product while implementing an importation of GMF.

As explained by Morris ands Adley (2000), trust is known as a vital parameter in this research measurement. The main characteristic of trust namely truthfulness. In the industry, trust is divided into two categories such as the information and the sources of that particular information (Hunt & Frewer, 2001). Hence, the information and sources shall be valid and believable. However, trust requires to be obtained not to expect or ask for (Frewer, Scholderer, & Bredahl, 2003). For example, the manager of food industry is prohibited to hide something about the risks and problems of GMF products purposely to avoid any controversies emerge upon detected by internet and other social medium which directly may lead the industry's performance to fall down (Wartburg & Julian, 1999).

Besides, this research has utilized trust due to there is a numerous evidences proved in the previous empirical study which exposed that trust is correlated and found as a strong element to the acceptability of GMF (Bord & O'Connor, 1992; Flynn, Burns, Mertz, & Slovic, 1992; Freudenburg, 1993; Kasperson, Golding, & Kasperson, 1996; Pijawka & Mushkatel, 1991; Siegrist, Cvetkovic, & Roth, 2000; Siegrist, 1999).

In addition, IA is also measured by knowledge as revealed by the precedent studies whereby an acceptance of GMF is affected and determined based on the strongest knowledge element about science or specific technology such as being supported by the previous researchers namely Prati, Pietrantoni, and Zani (2012). Thus, knowledge is an imperative element to gain an acceptance of GMF among the food industries. Hence, in the context of this study, an IA is best measured by perceived benefit, perceived risk, trust and knowledge.

Table 2.2
Previous research on IA

Author	Year	Measurement	Content
Kuznesof & Ritson	1996	1.GMF Attributes : Price, Quality and Food Purity 2.Type of Product 3.Production Methods	The research was done to identify the acceptability of GMF.
Bredahl, Grunert, & Frewer	1998	1.Use of products 2.Perceived producer related benefit 3.Price Consciousness 4. Perceived increase product quality 5.Perceived purity of product 6.Perceived wholesomeness of the product 7.Type of Product	The research was conducted to trace various factors on GMF acceptance.

Amin, Jahi, Nor, Osman, & Mahadi	2008	1.Awareness of benefits 2.Knowledge level 3.Confidence & Trust	The research exposed that the detection of benefits and risks will determine an acceptance of GMF.
Stone, Stone-romero, & Lukaszewski,	2006	1.Organization's value 2.Organization's goal 3.Organization's resource 4. organizational system and process	The research was Concentrated on factors affecting IA.
Connor & Siegrist,	2010	1. Role of Knowledge 2.Health Expectation 3.Naturalness 4.Social Trust	The research exposed factors influencing an acceptance of gene technology (GMF).
Frewer, Howard, & Shepherd	1996	Risk-Benefit perception	The research explained that the risks and benefits influenced the acceptance of GMF.
Frewer, Howard, & Shepherd	1997	1.Benefit 2.Risk 3.Ethics	An acceptance of genetic engineering related to the food, medicine and agricultural application.
Verdurme & Viaene	2003	1.Benefit 2.Risk 3.Trust 4.Knowledge	The research was implemented to trace the acceptance of GMF among enthusiasts, green opponents, balancers and half-hearted.
Knight & Paradkar	2008	Perceived Risk and Perceived benefit	The research was done to identify factors influencing an acceptance of GMF.
Tanaka	2004	1.Perceived Risk 2.Perceived Benefit 3.Trust 4.Sense of bioethics	The research focuses on major psychological factors affecting acceptance of GMF.

Rodríguez-entrena & Salazar-ordóñez	2013	1. Perceived Risk and Perceived benefit 2.Knowledge	Research was done to clarify factors influence an acceptance of GMF.
Siipi & Launis	2009	1. Production Procedure 2. Trust	Research was carried out to explain the opposition and acceptance between GMF and GM medicine.
Chen & Li	2007	1. Trust 2. Knowledge 3. Perceived benefit 4. Perceived Risk	The research was highlighted that perception and acceptance of gene technology varied according to the type of its application.
Mucci, Hough, & Ziliani	2004	Benefits	An acceptance of GMF varies across the countries.
Tait & Chataway, 2007	2007	1. Governance of corporations, 2.Technological change 3. Risk	Identifying factors motivated Multinational company to accept GMF in their market.
Frewer, Coles, Houdebine, & Kleter	2014	1. Benefits perception 2. Risk Perception 3. Trust	The research exposed plant-related to the application of GMF is more acceptable rather than animal-related application of GMF.

2.6 Definitions of Industry Strategy (IS)

The following (Table 2.3) lists some definitions of IS by several distinguished researchers in the field. The synthesize definition of IS for this research is defined based on the precedent works by Ackoff (1990) and Zahra and Covin (1993) which interpreted the IS as setting out the long term method or plan, establishing policy and regulation to ensure the production of GMF may be able to achieve the target and goal of the industry in order to determine the future direction of the industry.

Table 2.3
Various definitions of IS

Author	Year	Definition
Mintzberg & McHugh	1985	The trend of the decisions and activities that have been planned.
Hofer & Schendel	1978	The trend of the decisions and list of activities that have been planned along with the features that enable the industry to cope with the environment and achieve its goal.
Ackoff	1990	Setting strategic decision of the overall industry's objective which is involving a long term goal, establishing policy and principle to regulate the goal that should be achieved.
Zahra & Covin	1993	Achieving goals and objectives of the industry is based on the long term action plan.
Rhodes	2012	The industry is supported and established by the intervention of government to enhance the performance of the industry.

2.6.1 Types of Strategy Used By GMF Manufacturers or Producers

The strategies chosen by food manufacturers or producers can be grouped as follows :

i. Strategy of prior market research.

The market research is a major strategy which is need to be done by the food manufacturers or producers (Finucane & Holup, 2005; Moses, 1999). This strategy would help the company which having a small budget of financial to monitor and gain the information pertaining to the current situation of market before introducing GMF into the food industry (Baker & Burnham, 2001). This is for the purpose of making a differentiation between the characteristics of industry with GMF and without GMF in the existing market. Directly, this phenomenon would aid market research to be conducted within a budget and proper way (Shalhevet, Sason, Sherbo, & Sendler, 1988). Thus, this clearly indicates that prior market research is known as one of the strategies used by the food manufacturers in order to accept, use and commercialize GMF in their industry.

ii. Concentration on consumers who accept GMF.

Due to many consumers had rejected GMF, the food manufacturers need to detect the consumer with different characteristics such as identifying which consumers accept, consume and willing to pay for GMF because of its various benefits (Li, Curtis, McCluskey, & Wahl, 2002). In this connection, Mendenhall (2000) done the survey towards consumer who has rejected the GMF and the result showed that they were afraid of the

health effects. Thus, the food manufacturers need to produce GMF which contains additional nutrients to overcome their fear of health effect (Grunert, Bredahl, & Scholderer, 2003). By way of contrast, this situation will benefit the consumers who inherently accept GMF because they could be attracted and interested to the new GMF products. For example, based on the Gallup survey which has been implemented, the consumers with a high income and education level as well as young age will have a high tendency to accept and consume GMF (Saad, 1999). Thus, this phenomenon creates a strategy to the food manufacturers which is directly help the industry to estimate the size of the market for GMF being accepted.

iii. Partnership with intermediaries.

In order to boost up the profit of the industry which is adopting and practicing GMF, the food industry need to collaborate with the competitors to ensure the standardization of the industry. Therefore, the food industry can make a choice to collaborate with other third party such as non-government organizations (NGOs) for the purpose to acquire the certification as well as endorsement practice as stated and compulsory for the operation of industry (Ross, Pandey, & Ross, 2012). In addition, this strategy also stressing on partnership among multi-stakeholders such as combination of NGO and the government agencies in the industry's chain (Dentoni, Bitzer, & Pascucci, 2012). Besides, El Feki (2000) indicated that

cooperation between food industry and biotechnology industry could help the development of product to meet specification of the industry. For instance, in Germany, the food industry controls the two-third large supermarket by making direct agreement via food producers (Latacz-Lohmann & Foster, 1997; Vorley, 2007). Therefore, an adoption of partnership may be able to improve performance of the industry which is accepting the use of GMF in their production.

iv. Developing a large number of low-volume products and small market niches.

The strategy such establishing small and medium industry (SMI) will result in the excellent of industry at international level due to its ability to concentrate on focus, products, marketing as well as vast changes rather than straightly incepting a giant industries (Porter, 1990). For instance, Purcell (1999) & Turner (1999) indicated that an adoption the strategy of developing small industries only requires small budget to invest and also able to reduce the risk towards industry's business and operation rather that establishing the giant industries at the first stage. Simultaneously, GMF industry known as a heavy and risky business (Lusk & Coble, 2005; Vilella-Vila & Costa-Font, 2008; Wales & Mythen, 2002). Therefore, by developing and focusing to the SMI, it is easier to gain the investor attention because they prefer for the low-volume product (Edginton, 1999). Thus, this clearly shows that an establishment of SMI is much

better compared to the appearance of giant industry in order to improve the utilization and commercialization of GMF in the food industry's production.

v. Government support

The support from government is a strategy that caused an increasing development of GMF industry as occurred in Germany (Withold, 1999). An example of government support may derived from university and other institutions regarding scientific research such as providing well-trained scientist (Jennings, 1998) as well as preparing the knowledge and major problem solving related to GMF such as GM process and regulatory system (Shoemaker, 2001). Nonetheless, another government support such as providing long-term financial investment and the necessary amenities are the best strategy could be employed by the food manufacturers (Lawler, Meer, & Viseur, 1998). In essence, government support also categorized as a strategy for GMF manufacturers to expand its industry's operation.

2.6.2 IS and GMF

Strategy is an indicator and tool for the industry clarifies opportunity and success of its business value, operation as well as performance (Normann & Ramirez, 1993). The competitive global industry at this moment has insisted industry to properly design its business strategy (Kaplan & Norton, 2001). Even though the strategy is a paramount

aspect in the industry, there will be a tough moment for industry while formulating or developing the strategy (Stalk & Evans-Clark, 1992). This is supported by Batie (2008) and Baudouin (2012) which explained that the industry needs to pay closer attention while establishing the strategy of business for GMF; due to several constraints such as dynamic complexity and the controversy among the stakeholders which comprised of food manufacturers in the industry. On the other hand, in order to formulate strategy for the industry's business, it is an inevitable for the industry to face the challenges such as maintaining the quality of its product, creating and update idea for the development of product innovation as well as ensuring that industry would be able to step further into new business instead of having an ability to compete with the existing market (Chin, Chan, & Lam, 2008; Dangayach & Deshmukh, 2001; Tummala, 2000). Definitely, this statement shows that, the GMF industry resembles as other industry which requires strategy for its business and facing with the various challenges while establishing the industry's strategy.

Besides, Porter (1990) explained that industry structure and strategy are the main factors to determine the success of the industry. This is in line with the previous researchers namely Brandys (1988) and Withold (1999) indicated that the use of GMF in food production requires financial aids, amenities, well-experienced employees, and R&D from the early until end of production processes. For instance, during 1996, the GMF industry which located in America had consumed money approximately $16 million meanwhile, in Europe, $ 6 million of financial has been utilized for the R&D of GM industries (Lavoie & Sheldon, 2000). Moreover, another strategy that supposed to be adopted in the GMF industry is through collaboration between GMF industry with the

academicians and scientists from the university (Henney, 1998; Jennings, 1998; Young, 2001). Hence, the GMF industry requires proper strategy implementation to survive among other competitive industries.

2.6.3 Measurement of IS

Based on the rigorous review of the previous literatures, an IS is measured by the managerial interpretation and risk propensity as presented in table 2.4. The strategy and action of industry are affected by the managerial interpretation (Daft & Weick, 1984). Managerial interpretation known as a process taken by the leader of an industry by ensuring the event and other information of its environmental industry is in relevant (Dutton, Fahey, & Narayanan, 1987). However, managerial interpretation consists of environmental perspective namely threat and opportunity (Dutton & Duncan, 1987; Jackson & Dutton, 1988; Sharma, Pablo, & Vredenburg, 1999; Sharma, 1997). In the context of this research, managerial interpretation is a strong element of measurement for IS as supported by Dentoni et al. (2012) which indicated that the potential strengths and weaknesses of the industry can be detected based on the evaluation towards threat and opportunity (managerial interpretation) element.

Moreover, the risk propensity is clarified as the inclination of industry's decision maker either to take or avoid the risk (Sitkin & Pablo, 1992). The risk propensity of decision maker in the industry will be influenced by the customer demand, current global market, price, quality, technology as well as retailer or supplier's commitment (Pablo, 1997; Sitkin & Pablo, 1992; Stearns, Carter, Reynolds, & Williams, 1995). Therefore, in the context of this research, IS is best measured by the risk propensity such as supported by

the researchers namely Douglas and Wildavsky (1982) stated that the risk propensity is an important element to measure IS and as a prevention step for any incoming danger into industry. Hence, this study employs the managerial interpretation and risk propensity as a measurement for the IS.

Table 2.4
Previous research on IS

Author	Year	Measurement	Content	Method
Libby & Fishburn	1977	1. Risk propensity	The research was highlighted the risk propensity as a strategy that shall be taken care of in the industry for the purpose of making a decision.	Case study
Robert & Brockhaus	1980	1. Risk propensity	Risk propensity is a major determinant of strategies in small industry which emphasized on the entrepreneur.	Group study
Douglas & Wildavsky	1982	1. Risk propensity 2. Culture	Risk propensity and culture of industry are the contribution in the new technological industry (GMF) to examine the hazard which may be appeared.	Case study

Daft & Weick	1984	Managerial interpretation : 1. Threat 2. Opportunity	The research was carried out to explain how the industry makes a decision by formulating the strategies whereby the external environment will affect the strategy of the industry.	Case study
March & Shapira	1987	1. Risk propensity	The research was done to detect the phenomenon of risk taking as a one element in the strategy of industry for a manager or leader make a proper decision.	Questionnaire
Jackson & Dutton	1988	1. Threat 2. Opportunity	Threat and opportunity known as strategy while implementing activities such as scanning of environmental issue for the purpose of decision making.	Interview
Pablo	1997	1. Risk Propensity comprised of risk averse and risk taking which should be faced by manager of the industry.	The leader of industry pays closer attention towards risk before proceed to the decision making stage.	Phone-interview

Sharmas	1997	1. Managerial interpretation	The research was implemented to establish and test the framework of the strategy that has been adopted by the industry and the factors influenced it.	Questionnaire based-mail survey
Sharma & Nguan	1999	An environmental perspective : 1. Managerial interpretation comprised of threat and opportunity 2. Risk propensity of the manager	The research was determined the factors influence the strategy of industry while making a good decision.	Questionnaire
Sung & Hwang	2013	Environment perspective (external stakeholder) : 1. Managerial interpretation which consists of threat and opportunity 2. Economic incentive 3. Political pressure	The research was done to explain the external stakeholders factor plays an imperative tool as the IS in GM field.	Questionnaire
Wesseler	2014	1. Threat 2. Opportunity	The research was carried out to discuss the strategies were conducted by the food manufacturers and retailers.	Case study
Inghelbrecht, Dessein, & Huylenbroeck	2014	Environmental : 1. GMF as a marketing threat and opportunity	The research was done to expose the GM business strategy to handle the problem of business.	Semi-structured interview

Inghelbrecht, Dessein, & Huylenbroe	2015	1. Perceived structuring arena 2. Business environment : i. Social ii. Economic iii. Culture iv. Threat v. Value vi. Specific perceived rules (formal/informal)	The research was carried out to explain the business strategy involve in GM business.	Interview

2.7 Definition of Regulation

Regulation is defined as a rule, guideline, law or process of daily operation which is regulated, monitored and controlled by the Authority (Oxford Dictionaries, 2015). Moreover, the regulation is an official procedure or guideline regulated by the government and related authorities; such defined by the authors namely (Mclntosh & Turnbull, 2006). Meanwhile, the synthesize definition to represent regulation in the context of this study is based on Braitwaite and Peter (2000) which defined the regulation as a law, rules, concept and a basic tool to ensure either the operation of business can be carried out or stopped (pg. 9).

2.7.1 Regulation of Food Manufacturers in Malaysia

The food manufacturers play an imperative role in providing the food demand but at the same time, they are required to adhere with the regulation that has been set up by the government authorities (Stephensons & Arujanan, 2011). In Malaysia, the food manufacturing activities must be complied with the guideline stated by the Food Act

1983 and Food Regulation 1985 which enforced by the MOH and the Local Authorities whereby; the food manufacturers are urged to ensure that the foods are free from prohibited food additive and contamination, implementation of labeling for visualize the actual picture and content of food as well as adhering to the regulation and law that has been fixed during importation and exportation transaction. (The Canadian Trade Commissioner Service, 2015; Food Safety & Quality Division (MOH), 2015).

In fact, Malaysian food manufacturers have to obey with the standard requirement while implementing food processing which is known as an obligation imposed by the Malaysian External Trade Development Corporation (MATRADE) (Malaysian Biotechnology Corporation, 2010; Talib, Ali, & Jamaludin, 2008). In accordance with that, those standard requirements that must be complied by the food manufacturers in Malaysia are Good Manufacturing Practice (GMP) and Hazard Analysis Critical Control Point (HACCP) (MATRADE, 2015). GMP is a medium that provides regulation, code and guideline which properly handling the operational activity while producing food to ensure the whole food production is safe, ensuring the cleanliness and safety of the food at each stage of food production. Whereas, HACCP is under the purview of GMP which is functioned as a system that identifying, evaluating and controlling hazards to ensure the production of food is safe including processing, packaging, storage and distribution of food. (Department of Standard Malaysia, 2014). Those international standards of food quality practice were implemented to ensure Malaysia would retain as a competitive nation for the development of manufacturing activities as well as benefits the food industry in terms of enhancing the credibility and reputation of the food industry,

improving food manufacturers especially SMI which is very challenging due to intensifying global competitiveness.

2.7.2 Regulation of GMF in Malaysia

Regulatory system of GMF is an imperative mechanism that has to be monitored by the government (Vermeulen, 2004). GMF regulation which is related to the trade, manufacture and license are established and enforced purposely to ensure that the food manufacturers follow the regulation that has been designated (Shrestha & Shrestha, 2002). In Malaysia, modern biotechnology (GMF) is known as the most heavily regulated system that must be adhered by the food industry (Quah, 2007).

Therefore, all the activities which involved commencement, importation and exportation of GMF in Malaysia are placed under Biosafety Act 2007 which executed by the Ministry of Natural Resources and Environment (NRE) (Amin, Jahi, & Nor, 2013). In addition, regulation of GMF in Malaysia has been proposed and introduced by MOH. Any approval of GMF is analyzed based on the risk assessment approach that will be carried out by Genetic Modification Advisory Committee (GMAC). GMF product must be accessed and approved by GMAC before it is released and commercialized in Malaysian local market. However, before GMF being marketed, the Food Safety and Quality Division (FSQD) of the MOH will issue marketing approval once the food safety assessment of GMF has fulfilled the requirement that has been set up (Food Agriculture Organization (FAO), United Nation (UN), & World Health Organization (WHO), 2004).

Moreover, for the transaction related to GMF importation, the food manufacturers are required to obtain import permit from the Director General of Agriculture Department

(Foster, Berry, & Hogan, 2003). Hence, this directly shows that there are specific authorities or departments in charge for each regulation that has been set by Malaysian government to ensure the transaction of GMF manufacturing is running systematically.

Nonetheless, labelling is another important part that was applied into regulation of GMF in Malaysia. However, an implementation of GMF labelling contains several importance as follows : (1) If the contamination of GMF happened, the traceability and efficient prevention step could be taken. (2) Labelling can avoid the prevalence of GMF from enter into nation that does not allow and accept GMF. (3) Labelling will reduce the heavy process while making separation of GMF and non-GMF into the exporting nation. (4) Implementation of labelling shows that Malaysia is supporting the stringent regulation of GMF due to its position at CODEX Committee (Arshad, 2011). Consequently, at the beginning 2004, the mandatory labelling of GMF has been introduced and that GMF labelling was handled by FSQD. Later on that, the MOH has announced the mandatory labelling regulation of GMF on July 8, 2010 and stated that the enforcement of GMF labelling supposed to be started on July 2012. This phenomenon has opened the eyes of food manufacturers and their suppliers from overseas.

Surprisingly, the implementation of labelling regulation towards GMF has been postponed due to several factors. Firstly, uncertainty to enforce the labelling regulation. Secondly, possibility of GMF products list to be excepted from labelling was not confirmed. Thirdly, there is no specific language and place have been determined in oder to run the labelling regulation (Langtree, 2014; Wahab, 2012). However, the situation becoming more surprised when the labelling of GMF that would be imposed in Malaysia is stated and mentioned as not mandatory. In fact, the MOH is still in the process of

reviewing the labelling process as being revealed by the previous researchers namely (Amin et al., 2013). Therefore, the inconsistency implementation of GMF labelling in Malaysia shows that the labelling is classified as a complex and the hardest regulatory system to be implemented by the Malaysian government.

In conclusion, all those aforementioned of GMF regulations were conducted in Malaysia. Thus, until this moment, there is no any new rules have been added pertaining to GMF regulation.

2.7.3 Regulation of GMF in Other Countries

Each country varies in terms of the regulatory system of GMF. This is being supported by precedent researchers which have made a comparison and interpretation regarding GMF from different nation namely (Flint, Gil, Verastegui, Irarrazabal, & Dellacha, 2000; Hokanson & Ferenczi, 2011; Jaffe, 2004; MacKenzie, 2000; McHugen & Smyth, 2008; Mclean, Frederick, Traynor, Cohen, & Komen, 2003; Nap, Metz, Escaler, & Conner, 2003; Ramessar, Capell, Twyman, Quemada, & Christou, 2009; Solleiro & Galvez, 2002).

To exemplify that, any activities related to GMF such as manufacturing, production and importation in Australia are based on the regulation of Australia's Gene Technology Act 2000. However, in the aspect of marketing approval, all GMF must undergoes pre market safety assessment that will be handled by Food Standard Australia New Zealand (FSANZ) to ensure the safety of GMF which being sold in Australian market (FSANZ, 2005) . On the other hand, importation of GMF in Australia is handled by the Australian Quarantine and Inspection Service (AQIS) which requires importers to fully state about

the features of GMF which have been used on the import permit. (Thomas, 1998). Besides, Australia applied mandatory labelling for its GMF regulation.

However, in China, the government of China was concerned and focused on the risk assessment and GMF labelling that will be monitored by the MOH of China (United States Department of Agriculture (USDA), 2015). Besides, in order to obtain an approval of imported GMF from MOH, the certification indicated that the GMF has been tested undoubtedly must be attached while implementing GMF importation. (Malaysian Biotechnology Corporation, 2010). Furthermore, China was imposed stringent GMF regulation for the food industry that export their GMF to China. That export industry must apply an interim certificate from the Agriculture GMO safety Administration Office and must be evaluated and validated by the safety agency of the export industry (Marchant et al., 2004).

Conversely, the government's regulations of GMF in India is not strict and complicated if making comparison between Australia and China. For instance, there is no stringent regulation while importing GMF from Iran and Canada to India (Jayaraman, 1999). This was proved by Knight and Paradkar (2008) which exposed that there is no GMF labelling has been imposed due to the government's misconception that the GMF was difficult to carry out. On the other hand, all commercialization and importation of GMF in India must obtain an approval from the Genetic Engineering Approval Committee (GEAC) which was located under Ministry of Environment and Forests (Chopra & Kamma, 2013; Food Safety & Standards Authority of India, 2008).

However, this is totally different with the European Union (EU) and United States (US) whereby the regulation of GMF for both parties are remain complex. EU known as the most strict of GMF regulation. In EU, the GMF regulation has been regulated by EC Regulation 258/97 namely Novel Food Regulation which requires an expert (committee member) opinion to establish guideline of GMF instead of there was an exemption towards GMF labelling (Hodgson, 1999; Whitman, 2000). In fact, all commercialization and importation of GMF must be approved by the committee members of Novel Food Regulation before it is being placed into market (Vazquez-Salat, Salter, Smets, & Houdebine, 2012). In the same vein, the GMF regulation in USA was not stressed on the labelling system due to their law requirement only providing info about the details of GMF to the food manufacturers and not to consumers (Hamilton, 2001). The utilization and commercializing of GMF in the food industry must get an approval from the Food and Drug Administration to carry out the safety assessment towards GMF before it is being marketed (Nap et al., 2003). Consequently, this circumstance shows that although EU and US do not adopt labelling regulation towards GMF, but GMF regulation has remained complicated in both of that countries and will affect industry from other countries while doing the exportation or importation of their GMF into EU and US.

In addition, the regulation of GMF in UK requires industry to get the permission from the Health and Safety Executive (HSE) before using GM products or even ingredient contains GM (Halford & Shewry, 2000). In addition, the safety evaluation of GMF will be carried out by the UK Advisory Committee on Novel Food and Processors (ACNFP), specialists from other committee members, higher institutional such as the universities and research organizations. Thus, these committees will give permission before the use

and commercialization of GMF emerge in the chain of food industries due to their government extensively stressing on impractical method proposed by the World Health Organization that concern on the health and environment effect (Jonas & Kaferstein, 1995).

On the other hand, New Zealand does not apply the stringent regulation of GMF whereby there is no specific act or law has been fixed. New Zealand has followed the biosafety approach and placed the GMF under Hazardous Substance and New Organism Act (HSNO Act) (NEW ZELAND, 1993, 1996; Gardini, 2013). Meanwhile, Chile is another country that does not left behind in the aspect of strict regulation towards GMF usage and commercializing activities. All the foodstuffs consist of ingredients list, additives, date of product manufacturing and expiration, producer and importer's name as well as nutrition content must be labelled in Spanish before step into market of Chile while conducting GMF importation and exportation. (MATRADE, 2014). Thus, the mentioned GMF regulation in both New Zealand and Chile will cause other industries to get the actual picture regarding GMF regulation in making a preparation before execute the GMF importation and exportation with another country.

Furthermore, in Japan, before commercializing GMF into local market, the food manufacturers are required to obtain an approval from the Ministry of Agriculture, Forestry and Fisheries (MAFF) after the safety evaluation has been conducted by the Food Sanitation Law which is located under MOH, Labour and Welfare (MHLW) in order to achieve the requirement standards of the GMF safety (Uozum, 1999). The safety of imported GMF product will be tested by MAFF and MHLW. From the perspective of GMF labelling, Japan implemented mandatory labelling if GM ingredients are detected at

the finished product about 5 percent (Saegusa, 2000). This visualized that the labelling of GMF in Japan is based on the percentage of GM contain in the GMF product.

Last but not least, the regulation of GMF in Saudi Arabia is regulated, monitored and controlled by the Ministry of Commerce (MOC). The importation of GMF into Arab Saudi requires health certificate which indicated that an ingredient of GMF must be approved by the exported country (Hartmann, Khali, Bernet, Ghamdi, & Ruhland, 2012). Despite that, the Ministry of Agriculture has regulated that all imported and local GMF product requires labelling only upon the existence of GM into GMF product is 1 percent threshold otherwise, the labelling will not be imposed (Al-Saffy & Mousa, 2012; Australian Trade Commision, 2015).

2.7.4 Measurement of Regulation

As attached on the following (table 2.5), the regulation of GMF in the context of this study is best measured by approval process, risk assessment, labelling, traceability as proposed by Vigani and Olper (2013). These dimensions are measured to obtain the level restriction of GMF regulation (Vigani, 2010). Therefore, the approval process is a crucial in the GMF regulation because the introduction of GMF into countries may not happens without approval process (Vigani & Olper, 2013; Vigani, Raimond, & Opler, 2012). Hence, the approval process is a paramount element in measuring regulation because unapproved GMF in the market will lead to the difficulty of the industry to survive as revealed by researchers namely Kothamasi and Vermeylen (2011). On the other hand, the reason why risk assessment has been chosen as a dimension to measure the GMF regulation is because it holds a position as a strong element to measure regulation as

supported by Vigani and Olper (2013), Vigani et al. (2012), as well as Hood, Requensen, and Eversole (2012).

Moreover, as explained by Gruere, Carrer, and Farzin (2009) labelling is a strong element that suppose to be used as a measurement for GMF regulation. This is supported by Costanigro and Lusk (2014) which indicated the labelling plays an imperative role for the production, development and trade process of GMF in the industry to measure the stringency level of GMF. Besides, traceability is a vital element used by the industry to measure the stringency regulation of GMF as being elucidated by Schilter and Constable (2002), Vigani and Olper (2013), and Vigani et al. (2012) which had answered the question why traceability has been utilized to measure the GMF regulation. In conclusion, this study employed approval process, risk assessment, labelling, and traceability as an element to measure the regulation of GMF.

Table 2.5
Previous research on regulation

Authors	**Year**	**Measurement**	**Description**
Caswell	1998	1. Labelling	Focusing on the safety of product by taking labelling approaches in the process of regulatory system.
Whitman	2000	1. Labelling 2. Risk Assessment	Research was conducted to explain the regulation aspect involved in GMF such as safety of regulation and issue related to the labelling.
Halford & Shewry	2000	1. Risk Assessment	Elucidation on how the safety evaluation being done following step by step to fulfil the regulation that has been fixed.
Schilter & Constable	2002	1. Risk Assessment 2. Labelling 3. Traceability	Explaining the safety procedures of GMF.

Freese & Schubert	2004	1. Risk Assessment	The research was implemented to determine the factor influencing regulation of GMF in term of risk and safety assessment which emphasized on allerginicity.
Sanvido, Widmer, Winzeler, & Bigler	2005	1. Approval process 2. Risk Assessment	The regulation of GMF consists of rigidity approval process.
Pelletier	2006	1. Risk Assessment	The risk assessment was carried out to ensure the safety control and regulatory system of GMF are following the procedures that has been fixed.
Martinez, Fearne, Caswell, & Henson	2007	1. Risk Assessment	Discussing the regulatory process of safety for the food by implementing an assessment of risk.
Kothamasi & Vermeyle	2011	1. Approval process	The research explained that one of difficulties in market is caused by unapproved GMF.
Adenle et al.	2013	1. Risk Assessment	The cost of regulation is a main factor leads to the delay in the process of regulatory approval.
Vigani, Raimond, & Opler	2012	1. Approval process 2. Risk Assessment 3. Labelling 4. Traceability 5. Membership in the international	International trade of import and export transaction contains stringent regulation of GMOs according to the countries of the particular GMF industry.
Vigani & Olper	2013	1. Approval process 2. Risk Assessment 3. Labelling 4. Traceability 5. Membership in the international	Research was implemented to determine the factors influence GMF regulatory according to 55 countries.
Jaupi, Marku, & Bajraktari	2014	1. Risk assessment	Explaining on the element involved in the regulation of GMF instead of focusing to the safety of food and food labelling.

Choudhary, Gheysen, Buysse, Meer, & Burssens	2014	1. Risk Assessment	An assessment which is involved in the regulation comprised of manufacturing, use, import, storage and research of GMF.

2.8 Definition of Attitude

An attitude is defined as an inner assumption which elucidated based on the evaluation towards particular things, ideas, objects or situations with the degree level either positive or negative, supportive or opponent response such as approve or disapprove, like or dislike, approach or avoid, attract or averse (Eagly & Chaiken, 1993; Liver, Pligt, & Wighboldus, 2005).

2.8.1 Attitude of Stakeholders (Industries) and GMF

GMF attitude is defined as a positive or negative response, either it is seen useful or scary condition (Frewer et al., 1997; Purchase, 2005). This has been strengthened by Cacioppo, Gardner, and Berntson (1997) whereby an attitude of GMF usage and commercialization are powerful to be explained by both positive and negative element separately. Therefore, many stakeholders which emphasized on the food manufacturers or producers in western countries such as Germany, Italy, Netherland and Greece directly involved in the import and export chain of GMF (Knight, Holdsworth, & Mather, 2008). However, when dealing with the commercialization of GMF products, the process involved is complicated which requires skill to ensure other stakeholders are giving a positive attitude towards GMF (Paarlberg, 2002; Subrahmanyan & Cheng, 2000). For instance, as supported by Henderson, Weaver, and Cheney (2007) as well as Kimenju et al. (2011),

the manager or leader in the food industry has a responsible to make an appropriate decision regarding purchasing, selling and utilizing of GMF in the industry's production; will be based on their positive attitude towards GMF by looking at the quality, safety and preferences of GMF.

Simultaneously, the positive and negative GMF attitude among the stakeholders can be visualized. In the aspect of negative GMF attitude, as being exposed by Reg-Garcia (2006), Bett et al. (2010) and Areal et al. (2011), the food manufacturers had negatively rejected GMF due to the technology complexity, unpredictable effect that will take longer period, unforeseeable economic condition, appearance of the health and environmental damage, negative response from the public consumers as well as the status of unnatural GMF which may impede the industry's operation. Consequently, the food manufacturers in UK have shown their negative attitude towards the use and commercialization of GMF once they had removed all the GM products from their market due to GMF were rejected and banned by the consumers (Brossard, Shanahan, & Nesbit, 2007; Salehuddin, Ahmad, & Kadir, 2014). Directly, this circumstance clearly shows that the aforementioned external factors have contributed to the skeptical GMF attitude among the stakeholders.

Meanwhile, in the context of positive GMF attitude, Hoban (2004) revealed that most of the stakeholders (industries) from developing countries will tend to have a positive attitude towards GMF usage and commercialization. To exemplify this, Chinese industry have shown positive attitude towards GMF due to the availability of foods in the urgent situation, appearance of GMF to provide additional nutrient, potential of GMF to be placed into challenging market, confidence on government regulatory system, positive scientific exposure and also positive media factor (McCluskey, Grimsrud, & Wahl, 2006;

Rollin, Kennedy, & Wills, 2011). In addition, Taiwan also shown positive attitude towards GMF usage and commercialization because of the soybean and corn have been classified as a major item that contribute to the huge quantity of food importation in Taiwan (Chen, 2008). In fact, the industry that is coming from Philippines and Mexico have shown supportive attitude towards GMF due to the their stabilization political and culture condition (Sheikkha, Kalantar, & Vahidi, 2006). In summary, the stakeholders which are coming from the developing countries showed their positive attitude towards GMF.

2.8.2 Measurement of Attitude Towards GMF Usage and Commercialization

From the table 2.6, it can be summarized that although there are many variables to measure the attitude towards GMF usage and commercialization, previous researchers have shown highly tendency to use general attitude, familiarity, encouragement and moral or ethical concern as dimension to measure the attitude. As a corollary, this study employed those dimensions to measure the attitude towards GMF usage and commercialization.

This is being supported by Onyango, Govindasamy, Hallman, Jang, and Puduri (2004) as well as Amin, Azlan, Ahmad, and Ibrahim (2011) which justified that the moral concern has been used as a measurement of an attitude because it was found as a vital element or basically classified as a powerful that holds position as a supporter for the attitude of modern biotechnology or GMF. In fact, encouragement and familiarity is the second strongest element for measuring attitude after moral concern as being supported and indicated by Einsiedel (2000). Nonetheless, the general attitude being adapted for

measuring attitude in this research due to the reason explained by Bredahl (2001), Grunert et al. (2003) and Lahteenmaki et al. (2002) which exposed that general attitude known as the best element in measuring GMF attitude. In conclusion, measurement of attitude provided information for this research regarding what kind of attitude holds by the industry towards GMF usage and commercialization in their food production.

Table 2.6
Previous research on attitude to GMF

Author	Year	Measurement	Content	Method
George et al.	2000	1. Moral Concern 2.Encouragement	Moral concern and encouragement are detected as the factors influence attitude in Europe.	Interview
Bredahl	2001	1. Negative Attitude 2. Positive Attitude	The research was done to classified the major determinant of attitude on the GMF acceptance.	Interview
Lahteenmaki et al.	2002	1. Negative Attitude 2. Positive Attitude	An attitude was determined by the positive and negative response.	Interview
Grunert et al.	2003	1. Negative Attitude 2. Positive Attitude	The research was carried out to expose on how attitude affects GMF usage.	Interview

Frewer, Scholderer, & Bredahl	2003	1. Negative Attitude 2. Positive Attitude	The research was conducted to expose the measurement of overall attitude among the stakeholders on the food production.	Experiment
Kimenju, De Groote, Karugia, Mbogoh & Poland	2005	1. Moral Concern 2. Equity concern	The research was done to elucidate an awareness as well as attitude of stakeholders towards GMF production in Kenya.	Personal interview
Chen & Li	2007	1. Negative Attitude 2. Positive Attitude	Based on the research, attitude determines an acceptance of GMF production among the stakeholders in Taiwan.	Questionnaire
Knight, Holdsworth, & Mather	2008	1. General attitude towards the environmental, science and technology 2. Food Neophobia 3. Trust in regulators 4. Price sensitivity	An attitude of stakeholders from Europe, China and India have shown the various responses. Some were positive whereas some showed positive attitude.	Survey

Sorgot & Ambrozic-Dolinseks	2010	1. Negative Attitude 2. Positive Attitude	The research was implemented and exposed that an attitude tend to be viewed as a negative and the stakeholders felt insecurity about the application of GM in various fields such as food, agricultural, education and so forth.	Questionnaire
Bett, Ouma Okura, & De Groote	2010	1. Moral concern	The industry was negatively shown sceptical attitude while embracing the commercialization of GMF	Questionnaire
Amin et al.	2011	1. Encouragement 2. Familiarity 3. Moral concern 4. General concern 5. Engagement 6. Religiosity	The research was done to critically analyze the attitudinal factors towards modern biotechnology and the relationship among each others.	Questionnaire
Areal, Riesgo, & Rodrıguezs	2011	1. Agronomic & economic performance 2. Human health and environmental risk	The research was conducted to clarify the factors influence attitude of the European stakeholders.	Face to face interview
Kikulwe, Wesseler, & Falck-zepedas	2011	1.General attitude	The stakeholders are willing to buy of and shows positive attitude towards GMF due to the price remains same as non-GMF.	Questionnaire

Costa-Font & Jose	2012	1.General attitude	General attitudes toward science and technology influenced the attitude towards GMF.	Questionnaire
Amin et al.	2013	1. Familiarity 2. Moral concern 3. Encouragement	The research was focused on stakeholder's attitude towards food and medicine.	Survey

2.9 Gaps in the Literature

Based on the literature review, several inferences are made regarding the research gap. In regards to all the chosen variables from the conceptual framework, namely IA, IS, regulation and attitude towards GMF production, the following gaps are noticed :

1. As explained by the precedent literature, it is shown that there is a dearth of research on IA. Past studies tend to focus on end consumer acceptance. For example, many scholars exposed that the acceptance or rejection of GMF among the consumers from various countries was tremendously affected by the advantages or pitfalls of GMF consumption (House, Morrow, Lusk, & Moore, 2001). Hence, this is in parallel as indicated by Hornibrook and Fearne (2003) where there is a little research focusing on the food industry's research.

2. Furthermore, previous researchers concluded that the general result of GMF acceptance is complicated and the studies pertaining to GMF varied in the aspect of methodology and level of abstraction. For example, the specific perception

related to acceptance, attitude, and concentration of GMF have remained unclear and lack. (Bredahl et al., 1998).

3. Attitude is a one of the variables shown to have a relationship with the industry acceptance. Even though previous researchers suggesting the importance of attitude in influencing the acceptance of GMF among the industries, an empirical finding from the Kimenju, De Groote, Bett, and Wanyama (2011), Bett et al. (2010) and Woodside et al. (2005) stated that there is a dearth in research pertaining to attitude of stakeholders in determining the acceptance of GMF. This circumstance is supported by Areal, Riesgo, and Rodrıguez (2011), and Bett, Ouma Okura, and De Groote, (2010) that critiqued research pertaining to the attitude gives a high concentration to the preference of public consumers rather than focusing on the attitude of stakeholders. Thus, in the context of this research, the industry as a stakeholders has fulfilled the gap.

4. In addition, an empirical research on how GMF regulation affects industry acceptance is relatively less discussed in Malaysia. Previous researchers only tend to focus and explain what are the government and some other authorities involvement in establishing and enforcing the GMF regulation as well as what are the GMF procedures need to be adhered of (Adenle et al., 2013; Aerni, 2005; Bett et al., 2010; (Amin et al., 2013; Vermeulan, Kirsten, Doyer, & Schonfeldt, 2005). Therefore, the gap in this research has been fulfilled by discussing on how

regulations influence the acceptance of GMF among the Malaysian food industries.

5. Moreover, most of the GMF researches are being carried out in developed countries such as US, Europe, China, Australia, UK as compared to Malaysia; whereby GMF study is a new topic in Malaysia and present at a low level but it is very important to be discussed (Daud, 2002; Ibrahim et al., 2013; Kamariah Ismail et al., 2012). Hence, an empirical research on GMF is deemed necessary to be carried out in Malaysia.

2.10 Underpinning Theory

There are number of different theories have been used to explain the industry acceptance of GMF. The literature indicates that previous scholars have used theory such as Technology Acceptance Model (TAM) (Davis, 1989), Theory Reason Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and Theory of Planned Behavior (TBP) (Ajzen, 1985, 1991) and some scholars have combined those theories to explain the relationship in their research. Even though previous researchers have used different theories, this research is matched and best explained by using the Institutional Theory.

2.10.1 Institutional Theory

The institutional theory is an eminent elaboration for the action of individual and industry (Tatania Kostova, Roth, & Dacin, 2008). Thus, this is matched to the IS of GMF in this research; whereby the IS is influenced by the external forces to determine the decision

making or action that shall be taken in the industry (Sung & Hwang, 2013). Exemplifying that, in European United (EU), the industry will take action to maintain its success based on the strategies and methods employed by the food producers and retailers in their industry's operation. One of the strategies or methods implemented by the food industry which using or commercializing GMF is 'virtually-GM free'. That strategy enables the food industry to use and commercialize GMF in their production without requiring labelling implementation. In addition, for the food industries that unwilling to take risk for their business operation will take an action by adopting the strategy namely GM-labelling-free or GM-free; which does not contain any GM ingredient while producing and selling foods or products in the industry (Inghelbrecht et al., 2015).

Nevertheless, institutional theory consists of industry practice which giving an impact toward the shared knowledge as well as industry competence whereby they tend to be accepted and approved by the management and employee on the method employed by the industry to run its business (Kogut, 1991; Kostava, 1999; Kostova et al., 2008; Kostova & Roth, 2002; Szulanski, 1996). Thus, in the context of this research, there are many industries especially giant industries have accepted GMF due to its benefits such as providing additional nutritional for foods, pest-resistant, longer shelf-life while placing in the market instead of providing cheaper price of GMF and it is inherently contrast with other conventional foods (Chen, 2011). On the other hand, about 31 percent of industries willing to use a GM product due to its related to their operation and 20 percent of industries willing to use GM ingredients based on the cost involved whereas, 47 percent of food industry accepts GMF product based on regulatory requirement that relevant to industry's environment (Woodside et al., 2005; Ellahi, 1996). Nonetheless, the industry

practice which has been adopted from the institutional theory comprised of the procedure pertaining to the benefit and method that should be employed to ensure it will be accepted by other stakeholders (Hofstede, 1991). Therefore, this is aligned with the benefits derived from GMF that is seen to influence GMF acceptance among the industries which is being discussed in this research.

Many of the previous scholars have utilized an institutional theory in the industry especially in the multinational companies (Dacin, Goodstein, & Scott, 2002) due to one of its abilities is to refine the regulation that fall apart in the operation and business of industry (Eden & Miller, 2004; Kostava, 1999; Kostova, 1997; Kostova & Roth, 2002; Xu & Shenker, 2002). In accordance with this circumstance, there are regulations that suppose to be adhered by the GMF industry such happened in Iran and Canada whereby there are no strict and complicated regulation of GMF have been imposed by their government while exporting GMF to India (Knight & Paradkar, 2008) meanwhile in China, certificate must be issued for all products contain GM Chinese rice to prove and ensure that those products has been tested according to the regulatory system of GMF that has been fixed by the committee of China's regulation (Malaysian Biotechnology Corporation, 2010).

As indicated by Oliver (1991), institutional theory also considered the perspective of active agency that will cause many responses from the subsidiaries of industry once the parent industry employed that particular practice. Therefore, Kostova and Roth (2002) explained that response could be divided into behavior and attitude aspects which are being discussed in the context of this study. To exemplify that, the food industry in the UK, France, Canada and US showed their negative attitude by approving and

commercializing their non-GMF products only (Giannakas & Fulton, 2002) whereas, the industries which located in the division of the North America have shown their positive attitude towards GMF by accepting and commercializing it into market (Chua, 2001).

Hence, this study employs institutional theory as a basis for explaining the relationship between the variables in this study, namely IS, regulation of GMF, IA and attitude towards GMF usage and commercialization.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter contains the research methodology used in this research. It provides details of the research design and method used for collection of data as well as statistical data analysis. The following section is devoted to explain the research framework, hypotheses development, research approach and research subjects. A questionnaire was utilized and the method of data collection was briefly explained.

3.2 Research Framework

The conceptual framework of this study was developed based on the views presented in the past literature review concerning on the IA of GMF. In essence, the framework postulates that IS has been suggested by previous researchers to be directly and positively associated with industry acceptance (Sung & Hwang, 2013). Further, the framework also postulated that regulation of GMF having a positive relationship with the industry acceptance (Mitra, Tait, & Wield, 2011). On the other hand, Costa-Font and Jose (2012) indicated that an attitude has positively affects IA.

The conceptual framework presented in the study comprised of the independent variables which consist of IS, regulation and attitude. An IS is a dependent variable of this study. A framework illustrating the relationship between IS, regulation and attitude on IA is presented schematically in figure 3.1 as follow :

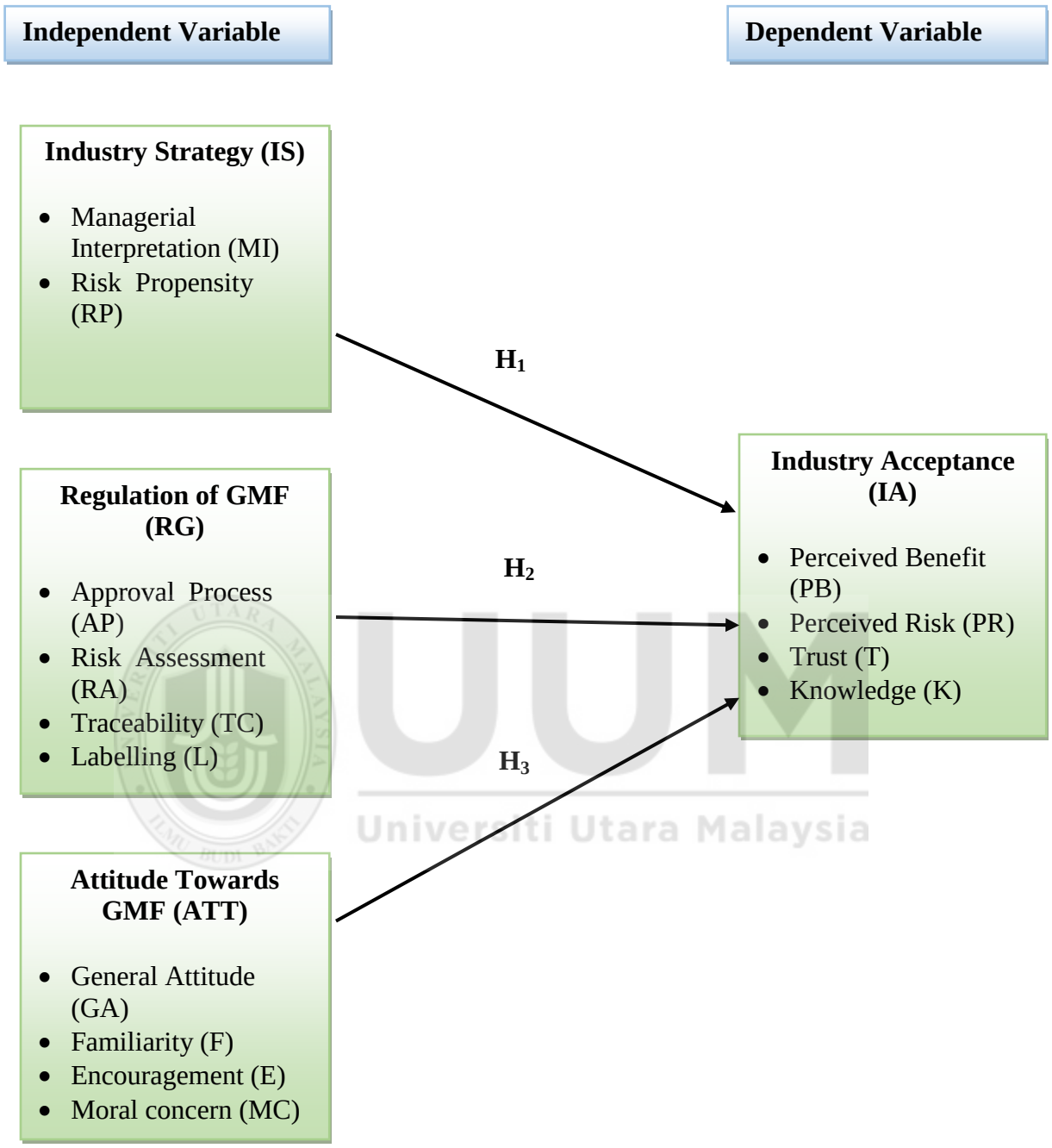

Figure 3.1
Conceptual framework

3.3 Hypotheses/Propositions Development

Below subsection mapped out the hypotheses development which has been tested in this research.

3.3.1 The Relationship Between IS and IA

Previous studies revealed that there is a relationship between IS and IA. The industry action and strategy are affected by the powerful antecedents namely managerial interpretation (Dutton & Duncan, 1987; Thomas & McDaniel, 1990). Therefore, there is a relationship between IS and IA. To exemplify in the context of this study, the higher tendency manager or leader of industry classified the GMF as an opportunity to the strategy of industry's business, there will be a higher acceptance of GMF in the industry (Sung & Hwang, 2013). This is also being supported by Mitra, Tait, and Wield, (2011) which exposed that an acceptance of GMF will be determined by the IS. Therefore, this study proposed that IS would directly and positively influence the IA. Accordingly, hypotheses 1 is presented.

H_1 : *There's an increase acceptance among the food industries through the implementation or support of proper strategy.*

3.3.2 The Relationship Between Regulation and IA

Past studies have indicated that there is a relationship between regulation and IA. Finding from past studies suggested that regulation determines the acceptance of GMF in

industries (Mitra et al., 2011). Hence, regulation framework in the aspect of approval process will influence an acceptance or rejection of GMF (Kothamasi & Vermeylen, 2011; Sanvido et al., 2005). For instance, during the approval process, if the GMF does not meet the standards and requirements in terms of quality, safety and efficacy as being set up by the regulatory system, that particular GMF will create a very long lead time of product development and cannot be marketed (Tait & Chataway, 2007; Tait & Williams, 1999). Hence, those complex and stringent regulations will inherently influence IA towards GMF. Therefore, the hypotheses 2 is presented :

H_2 : *There's an increase acceptance among the food industries through the implementation or support of systematic regulatory system.*

3.3.3 The Relationship Between Attitude and IA

Differentiation of attitude leads to the unpredictable acceptance of GM technology around the world (Kimenju et al., 2005). The relationship of attitude and acceptance could be detected from this study. As an illustration, an attitude and acceptance shows strong correlation based on the derivation result from the precedent studies (Sorgot & Ambrozic-Dolinseks, 2010). Besides, Costa-Font and Jose (2012) indicated that general attitude of GMF may positively affect an acceptance of GM technology. Hence, with this elucidations hypotheses 3 is proposed :

H_3 : *There's an increase acceptance among the food industries through the feedback or response of positive attitude.*

3.4 Research Design

The research design for this study shows that data was collected cross-sectional which employed survey methodology and all variables were measured at a one or same point of time (Cooper & Schindler, 2003). This research is correlational due to the primary objective was to identify the variables that might affect the industry acceptance. Correlational analysis is used when attempts are made to study causal relationship between important variables (Sekaran & Bougie, 2009). For this study, the relationship between each dimensions of industry strategy, attitude, regulation and industry acceptance among Malaysia's food manufacturers are examined.

The following subsections are devoted to detailed elucidation of the research design, population, sampling procedure, data collection method, research instrument, pilot study and the statistical analysis used to test the hypotheses. The field study for this research was conducted by using self-administered questionnaire in collecting data on studied variables.

3.5 Operational Definition

The operational definition for this study is devoted into two subsections which comprised of dependent variable and independent variables. A thorough elucidation pertaining to these operational definitions can be viewed on the following subsection (3.5.1 and 3.5.2).

3.5.1 Dependent Variable

The dependent variable for this study is IA. Industry acceptance is defined as the situation which is giving a feedback on how far the potential stakeholders are willing to

adopt, accept or reject something or any new technology. This definition of IA is adopted based on the previous scholars (namely Ausserer & Risser, 2005; Chang et al., 2007). Therefore, the operationalization of IA was measured by perceived risk, perceived benefit, trust and knowledge. Thus, perceived risk in this research is defined as the degree of the industry views GMF as a risky and endangered condition towards production and operation of the industry.

Nonetheless, perceived benefit is clarified as the degree of the industry positively views GMF as a valuable, safe and beneficial for the operation and production of the industry. Meanwhile, trust is defined as the capability of the industry truly believe about the source of information pertaining to GMF which has been provided by other stakeholders or institutions.

In fact, an IA was also evaluated by the knowledge. In this research, knowledge is defined as a level of the industry in gaining facts, information, skill acquires through experience and theoretical or practical understanding of GMF.

3.5.2 Independent Variables

The independent variables of the present study are comprised of IS, regulation and attitude. The operationalization of IS in this study was based on the earlier work by Ackoff (1990) and Zahra and Covin (1993). These researchers defined IS as a determination of industry's future direction by setting out the long term method or plan to ensure the use and commercializing of GMF in the food production may able to achieve the target and goal of the industry.

Meanwhile, the operationalization of regulation for this study referred to the previous researchers (namely Braitwaite & Peter, 2000; Mclntosh & Turnbull, 2006). They defined the regulation as laws, rules, procedures, guidelines regulated by the government and related authorities to ensure either the operation of business is carried out or stopped.

Attitude was further operationalized based on the precedent works done by Eagly and Chaiken (1993) as well as Liver, Pligt, and Wighboldus (2005). Therefore, in this research, attitude is defined as inner assumption which elucidated based on the evaluation towards particular things, ideas, objects or situations with the degree level either positive or negative, supportive or opponent response such as approve or disapprove, like or dislike, approach or avoid, attract or averse.

3.6 Measurement of Variables/Instrumentation

Measurement of independent variables and dependent variable of this research was carried out as follows. Details description of each measurement were discussed in chapter 2. All these measures were adapted from various sources, Table 3.1 summarized the measurement used in this study with its Cronbach Alpha and Coefficient Correlation.

Table 3.1
Measures of variables

Variable	Variable Measured	Source of Scale	No of item	Cronbach Alpha	Coefficient Correlation
DV	**Industry Acceptance (IA)** -Perceived Benefit -Perceived Risk -Trust - Knowledge	Amin et al. (2010) Chen & Li (2007) Prati et al. (2012b).	26	0.75-0.88	
IV	**Industry Strategy (IS)** -Managerial Interpretation -Risk Propensity	Sharma & Nguan (1999) Sung & Hwang (2013)	15	0.60-0.88	
IV	**Attitude Towards GMF Production** -General Attitude -Familiarity -Encouragement -Moral Concern	Amin et al. (2011, 2013) Frewer et al (2003) Grunert et al. (2003) Kimenju et al. (2005)	18	0.72-0.88	
IV	**Regulation of GMF** - Approval Process - Risk Assessment - Labelling - Traceability	Vigani & Olper, (2013) Vigani et al. (2012)	18		0.66-0.89
Demographic and organizational information		Respondent's position, respondent's department or job function, respondent's length of tenure, respondent's level of education, type of ownership, state of industry, number of employees and industry profit level.			

3.6.1 Research Instrument

This section describes the measure used in this study. The dependent variable for this study is industry acceptance. The independent variables proposed are industry strategy, regulation and attitude towards GMF usage. From the conceptual framework, the questionnaire was made up of five sections. Section A consisted of twenty six items measuring industry acceptance. Section B consisted of fifteen items measuring industry strategy, while section C contained eighteen items measuring regulation and follows by section D with seventeen items measuring attitude. Section F contains demographic-related items of respondent and the organizational information. The following subsections explained the items used in this study as a research questionnaire.

3.6.1.1 Industry Acceptance (IA)

The dependant variable for this study is IA. Therefore, in the context of this study, IA is measured by perceived benefit, perceived risk, trust and knowledge. There are twenty six items to measure IA. The four items of perceived benefit are adapted from Amin et al. (2011) whereas the balance of two items were adapted from Prati et al. (2012), using five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree. The items of perceived risk is adapted from Amin et al. (2011), using five-point Likert scales ranging from 1 = very not worried and no harm to 5 = very worried and very harmful. Trust is adopted from Prati et al. (2012) by using five-point Likert scales ranging from 1 = completely distrust to 5 = completely trust. Meanwhile nine items for knowledge is adapted from Chen and Li (2007), were measured through five-point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree to access the actual knowledge

of GMF (Lone Bredahl, 2001). Hence, the respondents were asked to rate their IA within their industry's environment.

Table 3.2
Items constituting IA

Question no	Code	Dimension	Item
1	IAPB 1	Perceived Benefit (PB)	In the long run, the use of GMF in the food industry would be a good contributor for the Malaysian economy and society
2	IAPB 2		The use of GMF in production would help to increase the productivity of food industry and will be a good contributor for the fight against Malaysian hunger
3	IAPB 3		The use of GMF in food production will increase food industry's performance
4	IAPB 4		The use of GMF in food production will enhance the quality of product in the food industry
5	IAPB 5		The use of GMF in food production would help food industry to be remained long lasting with another competitive industry
6	IAPB 6		An acceptance for the use of GMF in the food industry shows that benefits outweigh risks
7	IAPR 7	Perceived Risk (PR)	The use of GMF in food production creates the feeling of anxiety among the manufacturers in the food industry
8	IAPR 8		The use of GMF in food production will harm the performance of food industry
9	IAPR 9		The use of GMF in food production will lead to the long-term bad effect towards food industry
10	IAPR 10		The use of GMF in food production will lower the productivity of food industry
11	IAPR 11		The use of GMF in food production will impact the overall risk magnitude towards daily operation of food industry
12	IAT 12	Trust(T)	I would trust the government authorities or agencies in relation to communicate on the risk for the use of GMF in the food production

13	IAT 13		I would trust the Malaysian Ministry of Health in relation to communicate on the risk for the use of GMF in the food production
14	IAT 14		I would trust the Malaysian Agriculture Research and Development Institute (MARDI) in relation to communicate on the risk for the use of GMF in the food production
15	IAT 15		I would trust the Ministry of Natural Resources and Environment (NRE) in regards to communicate on the risk for the use of GMF in the food production
16	IAT 16		I would trust the Malaysian Islamic Development Department (JAKIM) in regards to communicate on the risk for the use of GMF in the food production
17	IAT 17		I would trust Malaysian Public Universities due to its responsibility to handle new research in regards to communicate on the risk for the use of GMF in the food production
18	IAK 18	Knowledge (K)	In the food industry, GMF is contrary to the conventional food because it contains genes
19	IAK 19		Enzymes are used in all foods
20	IAK 20		All bacteria found in food is harmful
21	IAK 21		Some protein found in foods can be toxic
22	IAK 22		Natural does not necessarily mean healthy
23	IAK 23		All processed foods in the food industry are made by using GM products
24	IAK 24		Most of the customers eat DNA everyday
25	IAK 25		To be healthy, food should be sterile before it is eaten
26	IAK 26		There is no laws or regulations on the use of GM technology in the food industry

Source : Chen and Li (2007); Amin et al. (2010) and Prati, Pietrantoni and Zani (2012).

3.6.1.2 Industry Strategy (IS)

A fifteen items measure taken from Sharma and Nguan (1999) and Sung and Hwang (2013) are used to measure IS. The questions measure two dimensions that contributing to form IS. These dimensions are (1) managerial interpretation and (2) risk propensity. IS is measured using five-point Likert scale, ranging from 1= strongly disagree to 5 = strongly agree. Fifteen measurements of IS are shown in Table 3.3 below. Respondents were asked to rate the IS according to their current management of their industry.

Table 3.3
Items constituting IS

Question no.	Code	Dimension	Items
1	ISMI 1	Managerial Interpretation (MI)	GMF is a key factor for the survival of food industry
2	ISMI 2		GMF represents a new opportunity for the business of food industry
3	ISMI 3		GMF is important to the development of food industry
4	ISMI 4		GMF would jeopardize the profits of food industry
5	ISMI 5		Investing in GMF can lead to competitive advantage in the food industry
6	ISRP 6	Risk Propensity (RP)	The use of GMF in production requires establishment of new strategies even they are risky for the food industry
7	ISRP 7		An implementation new strategies for the use of GMF in food industry are financially risky
8	ISRP 8		GMF usage in food production shows that food industry can quickly respond to the changes in customer demand

9	ISRP 9	GMF usage in food production shows that food industry can quickly expand into latest or global competitive market
10	ISRP 10	GMF represents lower product price in the food industry as a response to changes in competitor's price
11	ISRP 11	GMF usage requires food industry to develop and utilize new or advanced technology to produce faster production process
12	ISRP 12	GMF represents more contemporary and attractive product towards food industry
13	ISRP 13	The use of GMF in the food production shows that food industry can create product variety or differentiation
14	ISRP 14	Our major supplier can easily and positively respond towards GMF usage in increasing production volume in the food industry
15	ISRP 15	GMF represents food industry can quickly and easily switch to new supplier to produce lower production cost, better quality and improved delivery time

Source : Stearns, Reynolds and Williams (1995), Sharma and Nguan (1999), and Sung and Hwang (2013)

3.6.1.3 Regulation of GMF

Regulation is determined by using eighteen items measure, adapted from Vigani and Olper (2013) and Vigani et al. (2012). In this study, measurement of regulation is developed from its dimension namely approval process, risk assessment, labelling and traceability. Regulation is measured using five-point Likert scales, ranging from 1 = strongly disagree to 5 = strongly agree. The eighteen measurement of regulation towards

GMF production are shown in the table below. Respondents were asked to rate their regulation in accordance with their current regulation of industry and country.

Table 3.4
Items constituting regulation

Question no	Code	Dimension	Items
1	RGAP 1	Approval Process (AP)	The approval procedure of GMF regulation is not available in the food industry
2	RGAP 2		The regulation of GMF in the food industry is a mandatory approval process but no enforcement has been imposed until this moment
3	RGAP 3		The regulation of GMF in the food industry is a mandatory approval process that adopting substantial equivalence principle
4	RGAP 4		The regulation of GMF in the food industry is a mandatory approval process that adopting the precautionary principle
5	RGAP 5		The food industry does not involved in the approval process of GMF regulation due to GM free-country
6	RGRA 6	Risk Assessment (RA)	The risk analysis of GMF regulation is not available in the food industry
7	RGRA 7		In the food industry, the risk assessment has been proposed but no enforcement has been made until this moment
8	RGRA 8		In the food industry, the risk assessment is a mandatory
9	RGRA 9		The food industry does not implement risk assessment due to GM free-country
10	RGL 10	Labelling policies (L)	In the food industry, the labelling policies is not available
11	RGL 11		The food industry is adopting the voluntary GMO labelling

12	RGL 12		The food industry is adopting the mandatory GM label with the threshold more than 1 percent
13	RGL 13		The food industry is adopting the mandatory GM label with the threshold equal or less than 1 percent
14	RGL 14		The food industry does not involved with labelling policies due to GM free-country
15	RGTC 15	Traceability (TC)	In the food industry, the traceability of GM is not available
16	RGTC 16		In the food industry, the traceability of GM is far from the enforcement or is in place of an IP
17	RGTC 17		In the food industry, the traceability of GM is a mandatory
18	RGTC 18		The food industry does not implement the traceability due to GM free-country

Source: Vigani and Olper (2013) and Vigani et al. (2012)

3.6.1.4 Attitude Towards GMF Usage

Attitude is determined by using seventeen items measure, adapted from Grunert, Bredahl and Scholderer (2003), Frewer, Scholderer and Bredahl (2003), Kimenju, De Groote, Karugia, Mbogoh and Poland (2005), Amin et al. (2011), and Amin, Jahi and Nor (2013). In this study, measure of attitude was developed from its dimension namely general attitude, familiarity, encouragement and moral concern. Attitude is measured using five-point Likert scales, ranging from 1 = strongly disagree to 5 = strongly agree. The seventeen measurement of attitude towards GMF production are shown in the table 3.5 below. Respondents were asked to rate their attitude within their industry.

Table 3.5
Items constituting attitude to GMF

Question no	Code	Dimension	Items
1	ATGA 1	General Attitude (GA)	The application of genetic modification in the food production is extremely bad
2	ATGA 2		The application of genetic modification in the food production is extremely good
3	ATGA 3		The application of genetic modification in the food production is extremely foolish
4	ATGA 4		The application of genetic modification in the food production is extremely wise
5	ATGA 5		The food industry strongly accept for the application of GMF in the food production
6	ATGA 6		The food industry strongly reject for the application of GMF in the food production
7	ATF 7	Familiarity (F)	GMF is easy to be known by the manufacturer in the food industry
8	ATF 8		GMF is easy to be judged by the manufacturer in the food industry
9	ATF 9		GMF is difficult to be judged by the manufacturer in my industry
10	ATF 10		An effect of applying GMF in the food production was known by the food industry
11	ATF 11		The use of GMF in the food industry is controllable
12	ATE 12	Encouragement (E)	The use of GMF in the food industry requires more rigorous Research & Development (R&D)
13	ATE 13		GMF should be commercialized in the food industry

14	ATE 14		The use of GMF in the food industry should be given monetary support by the government
15	ATMC 15	Moral Concern (MC)	In the food industry, the use of GMF in food production is seen as an artificial or threaten natural order of things
16	ATMC 16		In the food industry, the use of GMF in food production is seen such leads to tamper with the nature
17	ATMC 17		In the food industry, GMF makers are seen as 'playing God'

Source : Grunert, Bredahl & Scholderer (2003); Frewer, Scholderer & Bredahl (2003); Kimenju, De Groote, Karugia, Mbogoh & Poland (2005); Amin et al (2011) and Amin, Jahi & Nor (2013)

3.6.1.5 Demographic Information of The Industry And Respondent

There are several questions regarding the respondents and organizations were collected and included as part of questionnaire in this research. The demographic information related to respondents consist of position, department or job function, level of education. In addition, among the industrial information asked were length of tenure, type of ownership, state of industry, number of employee as well as industry profit level.

3.7 Data Collection Procedures

Data for industry acceptance of GMF was collected using self-administered questionnaires. Postal and mail method were employed for this study. The questionnaire was sent out to the food industries accompanied by a cover letter, stating the purpose of the study and the assurance of confidentiality for the collected data.

Initially, a total of 248 questionnaires were posted to the managers of the food industries which are selected randomly from the list obtained from the FMM Directory, 2014. The rational of choosing these respondents from a manager level is because they are basically known as a person in charge or responsible to make a decision whether to accept or reject the product in their industry's production (Bukszar & Connolly, 1988; March & Shapira, 1987; Vaiman, Scullion, & Collings, 2012). Yet, they are also known as a person who directly related to the food operation of the industry as well as assigned to manage the importation and exportation of the food transaction in the industry. Absolutely, they have an ability to provide the trusted data on the acceptance of GMF instead of giving a correct answer to the questions and reliable feedback on any discrepancies that might be found in the questionnaire.

In order to distribute the questionnaire, respondents were contacted through email, face to face, and also by phone-called. The industries were given fourteen days to complete and return the answered questionnaire. During that period, the follow up was actively done upon distribution of questionnaire has reached on the respondents' hand. However, the second follow up had been done by telephone after four weeks according to the first distribution date of questionnaire as a reminder to unreturned questionnaire until an adequate number of responses had been received.

3.8 Sampling

The unit of analysis for this study was organizational level. The sampling frame is clarified as a list of all elements in a population of the study (Uma Sekaran & Bougie, 2009). The sampling frame for this study was food industries. On the other hand, the

sampling method used in this study was simple random sampling. Applying simple random sampling makes all the elements of population have a high possibility to be chosen into sample (Thiétart & Wauchope, 2001). Thus, this study is matched to use simple random sampling method because the population of this study contains all food industries in Malaysia which is not be divided or categorized into any section or group.

3.8.1 Population

The population of this study consists of the Malaysian food companies which is located throughout Peninsular Malaysia. The population for food industry in this research comprised of all processed food industries in Malaysia taken from the FMM Directory (2014). Based on this FMM directory, the total of food companies in Peninsular Malaysia is 656 industries.

3.8.2 Sample Size

This study used simple random sampling. Based on Krejcie and Morgan (1970) table such indicated in the following table 3.6, for the population size between 650 to 700, the appropriate sample size is 248 food companies.

Table 3.6
Table for determining sample size for a given population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

3.9 Pre-test

The pre-test is the small-scale versions of the study that collects data from respondents similar to the actual study which serves as guide to see whether the selected approach and method will work as intended or otherwise (William G. Zikmund, 2010). Doing a pre-test can expose problems in the research approaches. The problem can be dealt with before

the larger study is performed. The questionnaire used in this study was developed based on previous research and conceptual works. A pre-test was carried out to assess the validity and reliability of the measurement in the questionnaire. In addition, the pre-test was used to determine the clarity of item in the questionnaire.

Therefore, the pre-test of content validity in this research at the first stage was done by three academicians from Universiti Utara Malaysia (UUM). This is in line with Gay and Diehl (1996) suggested before the questionnaire being used in the actual study, pre-testing of the questionnaire by two or three people should be performed to detect any deficiencies and provide suggestion for improvement. Hence, the selection of academicians was based on their industrial experience in the food industry. The respondents were given a complete set of questionnaire to analyzed the items for readability, accuracy of words, clearness of questions as well as adequacy of the items used in the questionnaire. Furthermore, below questions (Table 3.7) were also enclosed and asked during the pre-test.

Table 3.7
Pre- test questions

Questions
1. Which part of any sentence in the questionnaire that you find confusing?
2. Which part of the questionnaire that you felt difficult to understand?
3. Which words in the questionnaire that you do not understand?
4. Which sentences in the questionnaire that you are unsure of the meaning?
5. Which question that you feel like overlapping with one another?
6. For each section, do you clearly understand the focus of the questions?
7. Do you feel comfortable reading the questions in term of clarity of printed words?
8. Are the font used for the words is big enough to read?
9. Do you clearly understand the relationship to each question?
10. Do you find it difficult to move from one section of the questionnaire to another?
11. Is the structuring of the questionnaire convenience to read and to answer?

The above questions were inserted during face validity process. There were several changes made towards wording of questionnaire, structuring and rephrasing few questions as recommended and commented by the experts. Entirely, the experts understood the questionnaire which includes of clarity, readability, clearness of question and items adequacy utilized in measurement. The questionnaires were then allowed to be distributed to the targeted respondents.

3.10 Data Screening

Before statistical analysis implemented, all received questions were thoroughly screened. Questionnaire contains large proportion of missing data were discarded for further

analysis (Hair, Money, Samouel, & Page, 2007). Data screening process plays crucial role in gaining useful, reliable as well as valid data.

3.11 Techniques of Data Analysis

Upon completing data collection process, the data analysis of this study was conducted by utilizing Statistical Package for the Social Science (SPSS) version 23. In providing the finding of this research, the following statistical techniques were implemented :

3.11.1 Descriptive Analysis

At the beginning stage of analysis, descriptive statistics which include background of the respondents, information of surveyed industry and variables of research were implemented in this study. It was then followed by the analysis of mean, range, maximum and minimum to describe the main characteristics of the sample in this study.

3.11.2 Factor Analysis

Factor analysis provides an understanding of the dimension and relationship for each variables in the proposed framework (Nunnally, 1978). Through factor analysis, the interconnection between large number of studied variables could be seen and analyzed. This factor analysis also known as data reduction technique to the dimension of variables (Hair, Black, Babin, & Anderson, 2010)

3.11.3 Reliability Test

This test of reliability was implemented to examine the internal consistency for each item in the questionnaire through Cronbach alpha value. This analysis plays an imperative role in ensuring all the items stated in the questionnaire were measured precisely.

3.11.4 Pearson's Correlation Analysis

Pearson's correlation used to indicate the direction, strength and significance of all studied variables. This analysis was undertaken in the context of this study to examine the relationship and direction linear relation among two variables. Detail explanation related to this Pearson analysis posited in the section 4.8.

3.12 Summary

Last but not least, this chapter emphasizes on the conceptual framework and methodology that will be utilized in this research. It highlighted the hypotheses development, research approach, questionnaire/instrument, data collection method as well as statistical data analysis/method. The result of the analysis and finding were presented in the next chapter, chapter 4.

CHAPTER FOUR
RESEARCH FINDINGS

4.1 Introduction

This chapter describes the vital part of this study which emphasized on the analysis undertaken and discloses the results of data analyses and hypotheses testing. Data were analyzed using SPSS software, version 23. This chapter starts with focusing on the response rate as being acquired based on the returned questionnaires to the researcher. This is followed by the data screening in order to obtain the information such as missing data, outliers as well as normality. Subsequently, this is followed by discussing on the respondents' profile in accordance with their demographic information. Next, the goodness of measurement part, in which the construct validity and internal consistency were tested and established. Later than that, the validation of hypotheses testing for this study were carried out by utilizing Pearson Correlation (r). Finally, a short summary of this chapter is provided.

4.2 Data Description

Referring to the explanation as indicated in the section 3.8.1, all the processed food industries in Malaysia are categorized as a population for this study. In accordance with the food industries listed by FMM directory 2014, stated that 656 food industries were constituted as population for this study. Out of that population sum, 248 food industries were distributed with the questionnaire through various mediums such as online survey (namely : Survey Monkey), email as well as self-administered to each of these food

industries that have been traced out. All those questionnaires were sent to the food industries starting on 2nd July, 2015 and it was over during 8th October 2015. After the duration of these three months of data collection, a total of 98 questionnaires were completed and returned to the researcher. This impacted to the response rate of 39.52 %.

Upon completion of the data collection stage, the obtained data were analysed by examining the data entry as well as handling the missing data. While reviewing or examining the completeness of the returned questionnaires, it was discovered that 20 questionnaires contained missing value, in which exceeding approximately 19.6 percents or more of the construct or variable measurement. As indicated by Hair, Money, Samouel and Page (2007), all questionnaires which comprised of the missing data with the proportion exceeded 10 % of the total response, requires to be eliminated. Thus, these cases of missing data were omitted from the preliminary analysis that will be conducted.

As a consequent, from the deletion or elimination of 20 cases of missing data, it was calculated that only 78 usable questionnaires or samples were remained in the SPSS database for further analysis. Apparently, the requirement of sample size has met the appropriateness to proceed with the analysis of this study. This is matched to the exposure of researcher namely Sekaran (2010) which indicated that the analysis is appropriate to be undertaken when the sample size is amounted larger than 30 and less than 500. Due to the effective or usable sample size for this study is 78, fortunately it is considered valid and satisfactory to implement this quantitative analysis.

Table 4.1 constitutes the response rate for this study.

Table 4.1
Response rate

Response	Frequency
Number of distributed questionnaires	248
Total returned questionnaire	98
Response rate	39.52%
Usable and completed questionnaires	78
Effective response rate	31.45%

In accordance with the respected Table 4.1, 39.52 percent is an effective response rate obtained from this study. As indicated by Anseel, Lievens, and Schollaert (2010), the respondent which being as a representative of the organization especially manager level would only manage to provide response rate below than 50%.

In fact, the food industry achieved response rate more than 50% when the questionnaire distributed more than one to the food industry due to their multiple department. Thus, this study distributed one questionnaire to the one food industry and the effective response rate of 39.52 is satisfactory.

4.3 Data Screening

Data screening involves a number of steps which comprised of the missing data, detection of outliers as well as normality test. This data screening plays an imperative role in order to ensure that any effect derived from the characteristic of data would not adversely affect the findings of this study. However, before implementing data screening process, all the items which contain negative statements in the questionnaires were being reversed coded.

4.3.1 Missing Data

Identifying missing data is an initial step in the data screening process. Unfortunately, obtaining a complete set of data for all cases or questionnaires is quite impossible (Coakes, 2013). This is mainly due to the missing data in any research which is being carried out known as a common phenomenon; whereby the valid values of one or more items in the scale are not available or missed out to be filled for data analysis (Hair, Black, Babin, & Anderson, 2010, p.42). Respondents' failure to answer one or more items in the questionnaire, in which leaving the items blank led to the occurrence of missing data (Uma Sekaran & Bougie, 2009). This circumstance of missing data was happened due to the respondents omitted or refused to answer certain question or lack of knowledge concerning certain questions in the questionnaire. However, in the context of this study, there were 20 cases or questionnaires declared as missing value which have directly reduced the usable cases from 98 to 78.

4.3.2 Detecting Outliers

Detecting outliers were the second step implemented through the data screening process. Outliers known as an extreme case in the set of data that out of normal range and it may affect the findings or results of data analysis (Zikmund, Babin, Carr, & Griffin, 2010). In this study, the examination of outliers in the data set have been undertaken in order to avoid any adverse impact that may derived from the outliers. There are few ways to examine the presence of outliers as the following.

Firstly, the outliers will be screened by using the box plot in SPSS database. The cases will be defined as outliers when there are little circles with the attachment of the cases'

ID number appeared in the box plot (Pallant, 2011). However, in order to ensure these circles are exactly represent the outliers, it could be traced through the following methods. 1) If the cases has any extreme scores whereby it have three or more lengths from the upper or lower edge of the box, it will be indicated with an asterisk. 2) Cases with value between one and half as well as three box lengths from the upper or lower edge of the box are defined as outliers (Coakes & Ong, 2011; Coakes, 2013; Pallant, 2011). Hence, in the context of this study, no extreme scores have been found. Meanwhile, the details of the outliers presented as the following Table 4.2 :

Table 4.2
Summary of outliers (n=78)

Variable	**Outlier Cases**
Industry Acceptance	Q29, Q59, Q74
Industry Strategy	None
Regulation	None
Attitude	Q74

In addition, outliers could also be seen through standard score (z) (Kumar, Talib, & Ramayah, 2013, p.58; Meyers, Gamst, & Guarino, 2006, p.171). Cases exceeding range of +/- 2.5 considered as outliers for the sample size which is smaller or equal to 80 observations. Besides, for the sample size which is larger than 80 observations, cases will be interpreted as outliers when the z score is out of range between +/- 3.00. Thus, in this study, there are 3 cases namely Q29, Q59 and Q74 exceeded the range of +/- 2.5 z score. From the test that has been carried out, 3 out of total 78 cases were considered as outliers such being depicted in the Table 4.2. Therefore, all those outliers have been removed as recommended by Pallant (2011). Any extreme outliers requires deletion from the data

file in order to diminish adverse effect on the empirical findings or results of the analysis (Hair et al., 2010). Subsequently, 3 cases were deleted from the data set and leaving 75 valid cases that were satisfied for further analyses.

4.3.3 Test of Normality

Upon deletion three cases of the outliers, the usable of 75 cases have gone through the normality test by using SPSS software version 23. Normality test was conducted by evaluating the value of skewness, kurtosis as well as Shapiro-Wilk such shown in Appendix B. The acceptable values for both skewness and kurtosis considered be in the range of normal curve are between -1 and +1 (Meyers, Gamst, & Guarino, 2013, p.140-141). The following Table 4.3 exhibits the skewness and kurtosis values for this study.

Table 4.3
Normality test : Skewness and Kurtosis Statistic (n=75)

Variable	Skewness	Kurtosis	Description of Distribution
Industry Acceptance	-0.320	-0.471	Normal Distribution
Industry Strategy	-0.293	-0.325	Normal Distribution
Regulation	0.151	-0.700	Normal Distribution
Attitude	-0.342	0.062	Normal Distribution

With the reference to the above table (Table 4.3), it is indicated that the data was normally distributed. This is mainly due to none of the variables exceeded the values of kurtosis and skewness more than +/- 1. Upon completing the test of skewness and kurtosis value, the test of Shapiro-Wilk was implemented subsequently. This was strengthened by Coakes (2013) which implied that the Shapiro-Wilk test matches with

the small sample size of normality test. Shapiro-Wilk used for the sample size less than 100, which matched to 75 observations of this study. Beside that, this Shapiro-Wilk test tend to be more powerful and the best selection to assess normality's departure (Meyers et al., 2006). A distribution of this study is considered as normal when the significant value is more than 0.05 (sig>0.05). Therefore, the result of Shapiro-Wilk test exhibited as the following table 4.4.

Table 4.4
Normality test : Shapiro-Wilk Values (n=75)

Variable	**Shapiro-Wilk**		**Result**
	Z	**Significant**	
Industry Acceptance	0.980	0.280	Normal
Industry Strategy	0.971	0.080	Normal
Regulation	0.975	0.151	Normal
Attitude	0.970	0.068	Normal

In short, the above table 4.4 indicated that industry acceptance, industry strategy, regulation and attitude comprised of the significance values exceeded 0.05 (p>0.05), in which constituting data was normally distributed. Hence, this circumstance does not violate the assumption of normality and parametric test. Therefore, the hyphotheses test of this study were undertaken through parametric test.

4.4 Demographic Information

This section exposes information pertaining to the background of the respondents as well as details of the companies. However, the amount number of respondents involved in this research was 75. The details of respondents and company profile were analyzed by using

frequency analysis to represent the finding or result. The frequency analysis was visualized through pie chart which has been labelled according to the percentage values. Thus, percentile data of demographic information for this research could be shown clearly. Consequently, the percentage data pertaining to the comparison of lowest and highest number of respondents answering the questions could be obtained.

4.4.1 Job Designation/Position

This section defines the designation of respondents involved in answering the distributed questions. The respondents came from various levels of designation in their companies. Some of them were from top management, middle management and bottom management. As depicted in figure 4.1, respondents who hold the position as senior manager was 29%. This is followed by the first line manager which amounted 27%. Subsequently, middle manager was recorded 24 %, meanwhile Executive was 16%. In addition, the respondents came from the designation of senior executive as well as clerk in the selected companies were 3% and 1%. Thus, this circumstance was matched to the target of researcher, in which expecting the distributed questions would be answered by the company's top management. They were selected because they have knowledge, experience as well as directly involved in the acceptance of GMF in their companies. Furthermore, the highest and lowest percentage responses derived from the respondents' designation were clearly shown as follows :

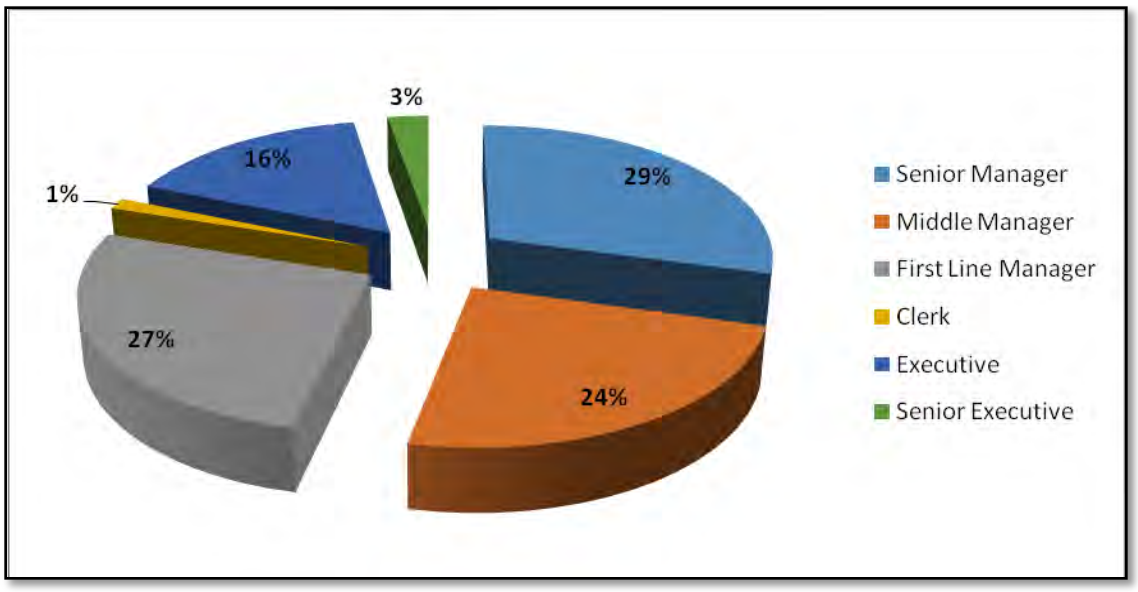

Figure 4.1
Designation of Respondents

4.4.2 Department Attach to the Selected Industries

In accordance with the figure 4.2 in this study, finding showed that the respondents who answer the questionnaires came from different department they being attached to in their companies. For instance, there were department of Information Technology (IT), Sales/Marketing, Finance/Accounting, Customer Service, Human Resources, Administrative, Operation, Quality as well as R &D. From this result, it could be seen that the highest respondent represented by the Operation department was 27%. This was followed by both departments of Sales/Marketing and Administrative/Owner which amounted the same 21% respondents. Besides, respondents came from Quality department was about 12%, in which contradicted only 1% with Human Resource Department (11%). Meanwhile, respondents came from the Department of Finance/Accounting were about 4%. Another 2% of the respondents were from IT

department. However, the lowest feedback provided by the respondents from two departments of Customer Service and R&D were respectively 1%. Obviously, the finding shown in the following pie chart indicated that the sent questions were answered by the respondents from targeted department namely operation department.

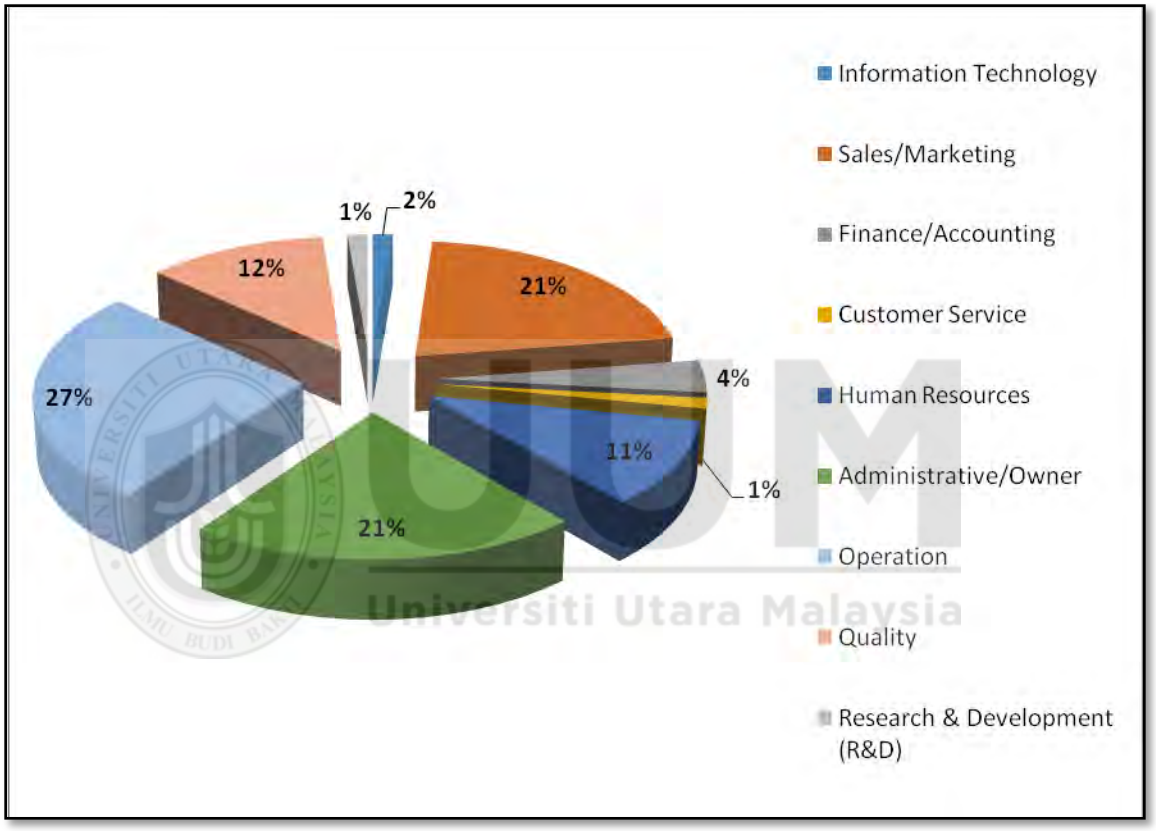

Figure 4.2
Department of Respondents

4.4.3 Tenure of Employment

Based on the findings shown in the figure 4.3, there were five categories of employment tenure among the respondents in this study. Majority of the respondents have been

working with the company more than 1 year and not exceeded than 3 years period which amounted 32%. On the other hand, 25% of the respondents have been working with the selected companies within 4 to 5 years. Next, there were 16% of the respondents worked with the period of 5 to 10 years. Last but not least, only 3% of the respondents were recorded working with the companies more than 10 years. Thus, as enumerated by the biggest percentage of respondents' year retention in the companies, it is revealed that most of the returned questionnaires were answered by the experienced respondents.

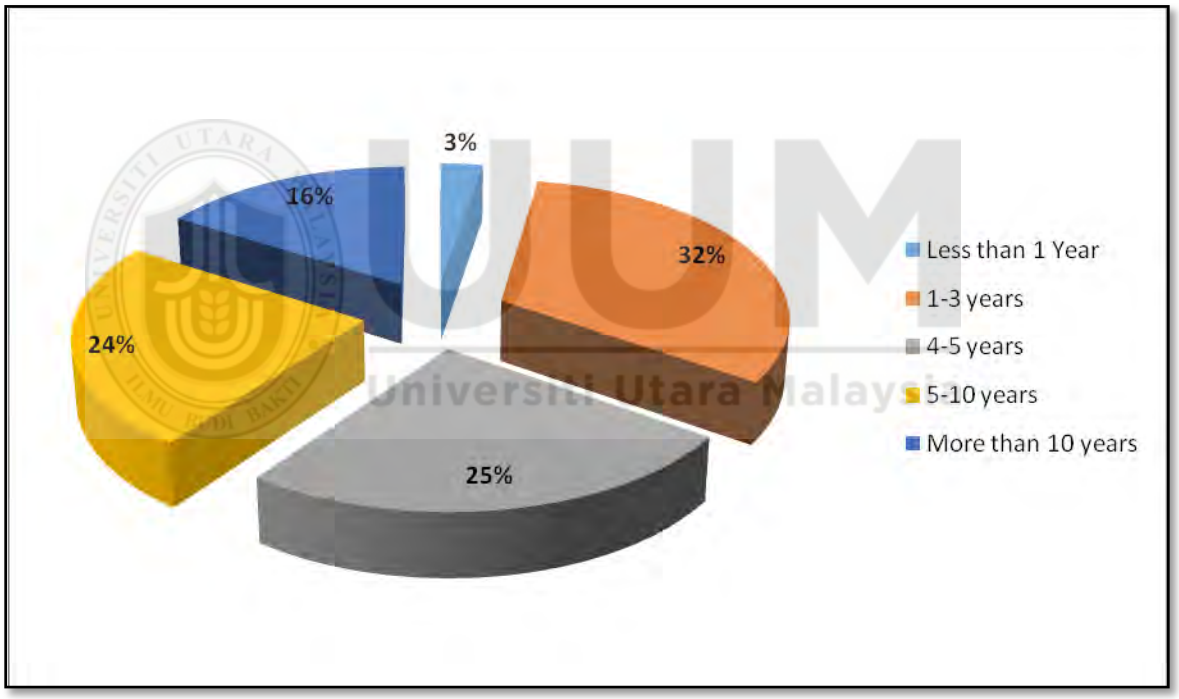

Figure 4.3
Respondents' Tenure of Employment

4.4.4 Education Level

As illustrated from the finding, it could be seen that there were two comparisons in terms of respondents' education background found in this study. For instance, 83% of the respondents who had finished their studies, graduated from the tertiary, college as well as a university, in which known as the highest percentage. This was contrary to the 17% of the respondents that only ended their education level at the secondary school. Therefore, the result derived from the figure 4.4 shown that this result have fulfilled the expectation of researcher, in which requiring questions should be answered by the respondents who have higher academic qualification. However, none of the completed questions for this research were answered by the respondents from primary school and informal education level such shown in the following figure :

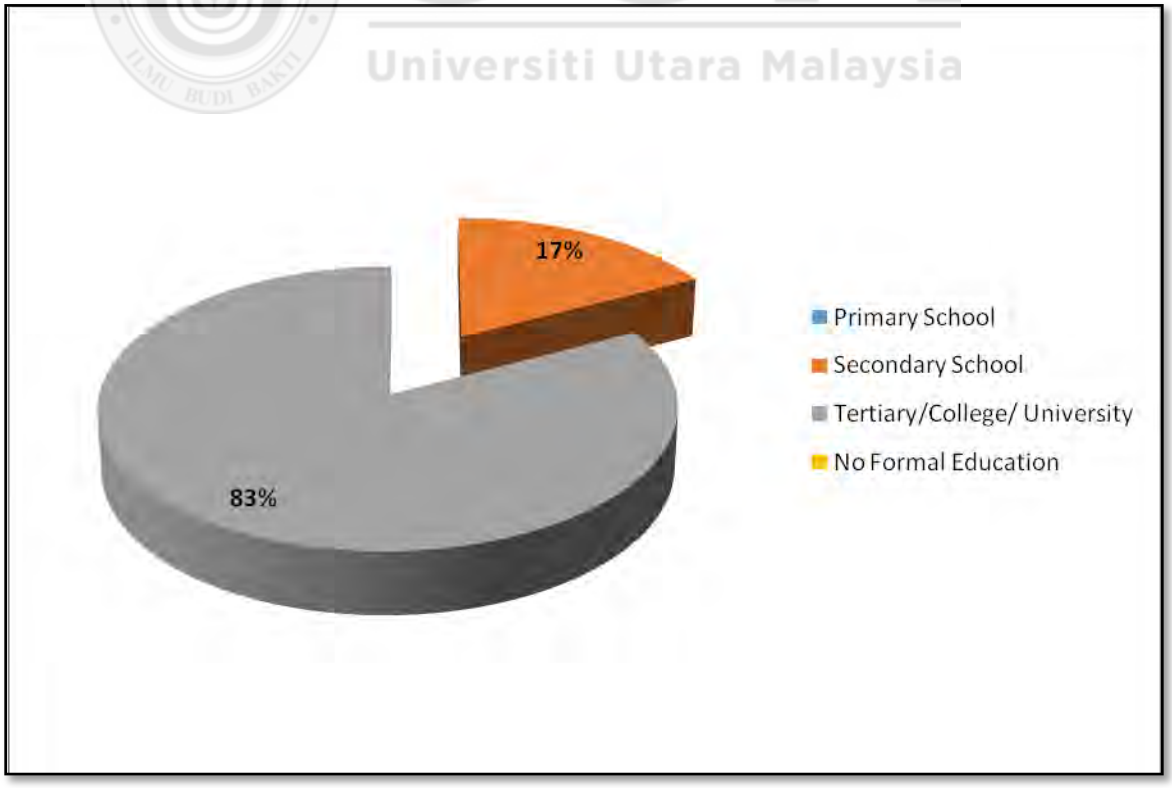

Figure 4.4
Education Background of Respondents

4.4.5 Industries Ownership

The data of the industry ownership are highlighted in this research. Among of them were MNCs, local industry and joint venture companies. As an overall, it is exposed that 67% of the respondents came from the local industry throughout Malaysia. Furthermore, it was followed by the 19% of the respondents allocated in joint venture companies. It is also exposed that the result were contributed by the respondents from MNCs. Simultaneously, the percentage amount of industry ownership from MNCs was about 14%. Hence, the following figure 4.5 shows the frequencies of the industries ownership obtained from this research.

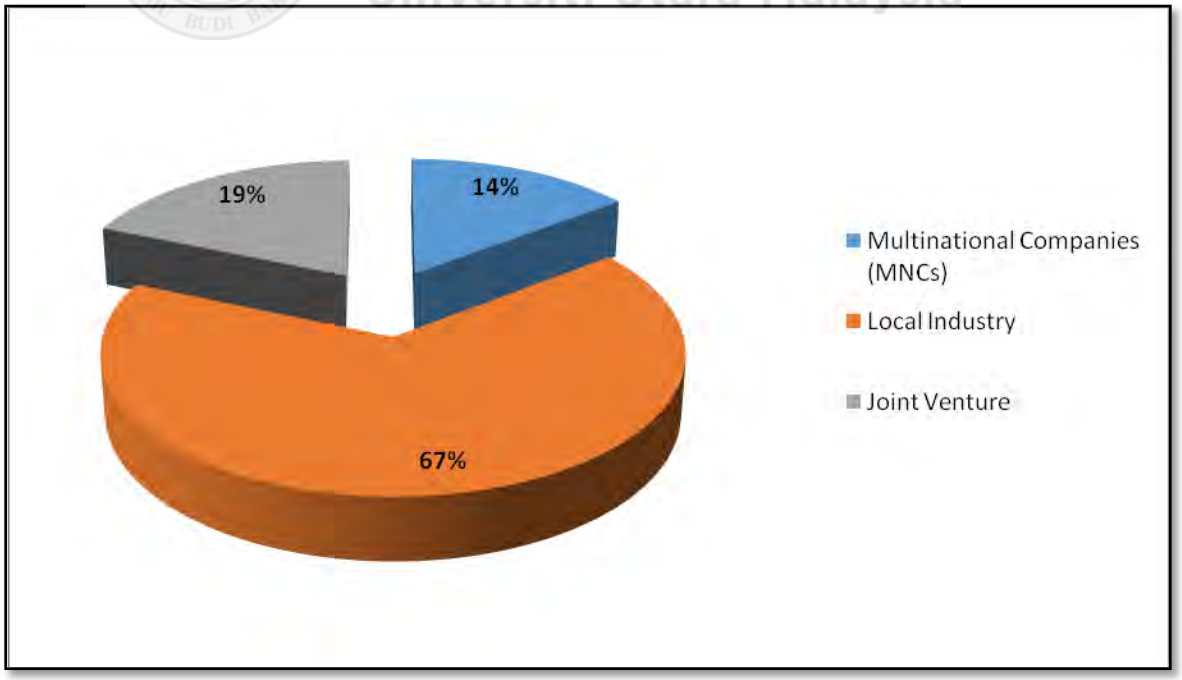

Figure 4.5
Type of Industries ownership

4.4.6 Location of Selected Industries

According to the result provided by the respondents, all of selected food industries throughout 14 states of Malaysia were demanded to complete and return the questionnaire to the researcher. However, from the results scored, it was out of researcher expectation when the food industries from several states such as Pahang, Terengganu, Perlis, Sabah and Sarawak did not respond and return the completed questions. In accordance with the figure 4.6 below, fortunately, 27% of the food industries located in Penang were recognized as the highest state which contribute to this study. This was then followed by the food industries came from Perak which amounted 19% of the total percentage according to the location of selected industries. In addition, Johor was a third state which contributed 17% response or feedback towards this GMF survey. Fourth, 16% of the questions were completed and returned by the food industries from Selangor. Fifth, 9% were from Kuala Lumpur, while another 3% were from Negeri Sembilan. Meanwhile, the balance of 1% represented by both food industries from Kelantan and Melaka.

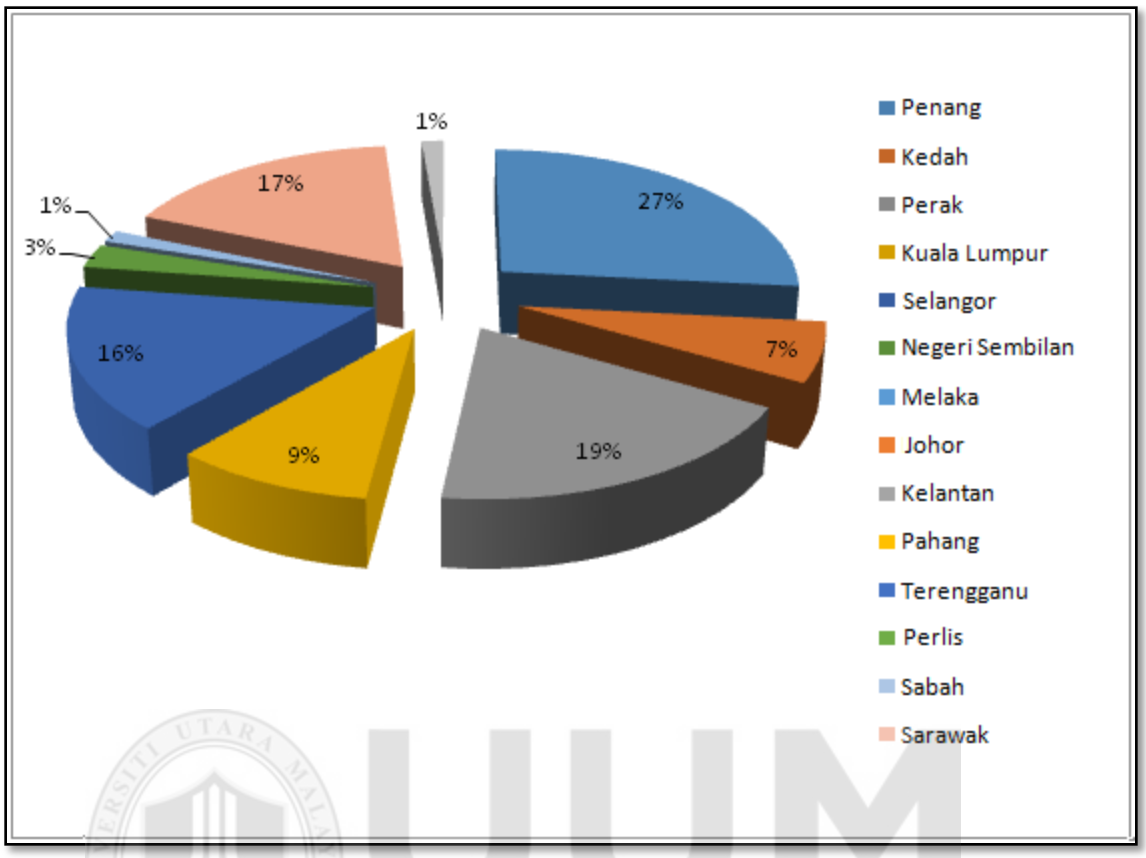

Figure 4.6
Industry's Location

4.4.7 Number of Employees

As summarized by the figure 4.7, the number of employees was based on the selected food industries. Therefore, the size of the selected food industries in this research was determined by the number of employees employed in this research. Most of these food industries (40%) were large companies, employing more than 50 workers. 20% of the food industries employing not more than 20 workers whereas, another 14% industry comprised smaller or equal to 30 workers. In fact, there were 12% of the food industries known as small companies, in which employing less than 10 workers. Another 9% of the

food industries employing less than 41 workers (31-40 workers). The balance of 5% was the amount of food industries employing approximately 41 to 50 workers. Although there were several categories of the employee number in the food industries, the researcher sent only 1 question to each of the selected food industries.

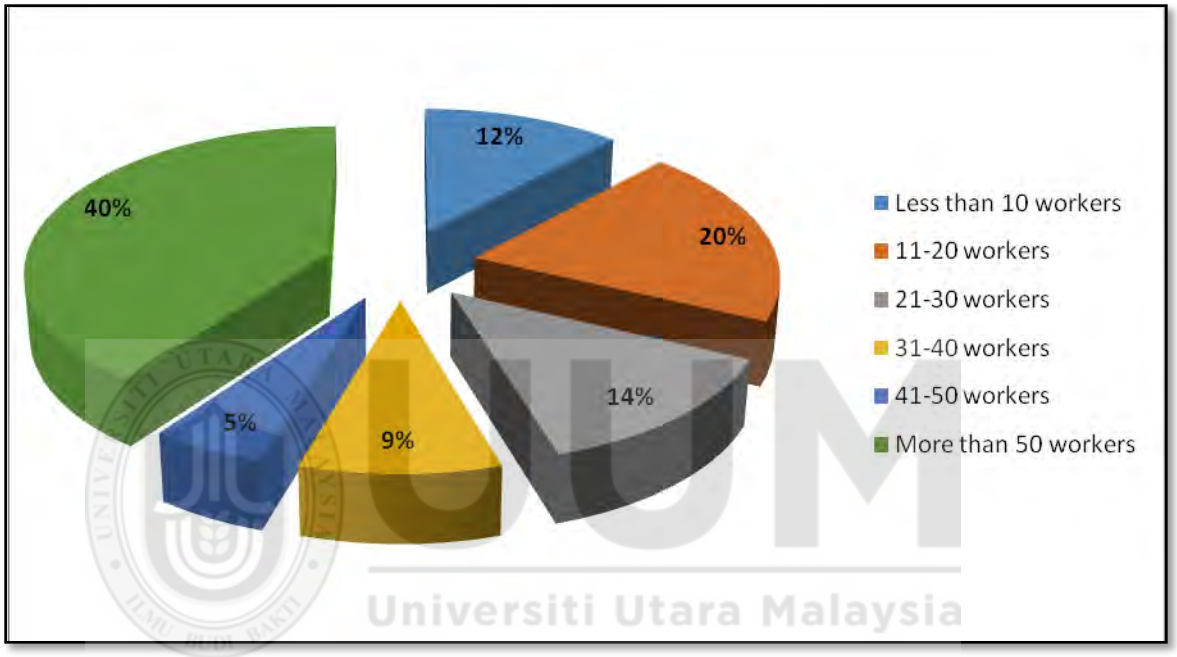

Figure 4.7
Total of Employee According to the Selected Industries

4.4.8 Profit Level

The respondents were also not exempted to reveal the profit level in their food industries. Referring to the figure 4.8, it is denoted that 46% of the selected food industries earning their profit less than 10 million according to their annual report. Furthermore, it was recorded that 27% food industries earning their profit in the range between RM 10 million to 25 million. Coincidentally, another balance of 27% food industries earned their

profit more than RM25 million, in which summarizing these industries was collecting the highest income per annum.

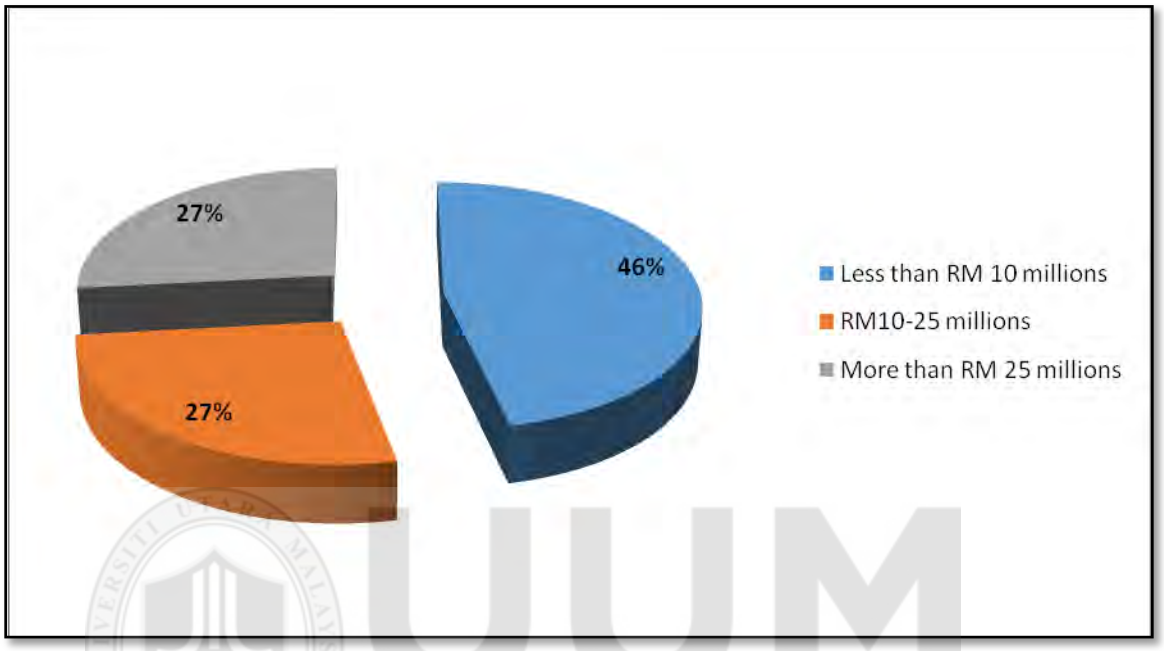

Figure 4.8
Profit Level of Industries

4.5 Descriptive Statistics of Variables

This section explains the descriptive statistics pertaining to all variables of this research. Descriptive statistics are utilized to analyze, summarize and describe the characteristics of the collected data (Coakes, 2013; Pallant, 2011). Besides, this descriptive technique would also be used in measuring and explaining the central tendency and dispersion of those data studies. Since the data for this research was normally distributed, the best technique to explain the central tendency is by using mean. Mean is an average value

from the entire set of data, which is most often utilized in calculating central tendency (Kumar et al., 2013, p.182).

The range was also be utilized in measuring the dispersion for this research. The range is the difference between the highest and lowest values within a set of data or number (Coakes, 2013). In addition, due to the collected data in this study was normally distributed, the inferential statistics could be performed to explain the data. Thus, the generalization of the population of this study from the obtained sample could be assumed. The following subsection portrayed the central tendency, dispersion, maximum and minimum value of the data obtained in this research.

4.5.1 Mean and Range Analysis for Industry Acceptance

Table 4.5 exposed twenty-six items for dependent variable namely industry acceptance, which were measured by using mean and range. Each of these items have different mean values. The highest mean value for industry acceptance was from item number two, with the value of 3.87. This clearly explained that most of the respondents have seen the benefits of GMF acceptance as improving industries' productivity as well as reducing food shortage. The lowest mean value was 2.39; in which emphasized on the item of 'All processed foods in the food industry are made by using GM products'. In the aspect of range, all the items contain the range values between 3 and 4. All the items share the maximum value of 5 except item number twenty-two with the value of 4. Meanwhile the minimum value for this industry acceptance ranging between 1 and 2.

Table 4.5
Mean and Range Analysis for Industry Acceptance

No	Items	Range	Minimum	Maximum	Mean
1	In the long run, the use of GMF in the food industry would be a good contributor for the Malaysian economy and society	4	1	5	3.64
2	The use of GMF in food production would help to increase the productivity of food industry and will be a good contributor for the fight against food shortage	4	1	5	3.87
3	The use of GMF in food production will increase food industry's performance	4	1	5	3.64
4	The use of GMF in food production will enhance the quality of product in the food industry	4	1	5	3.67
5	The use of GMF in food production would help food industry to be remained long lasting with another competitive industry	4	1	5	3.77
6	An acceptance for the use of GMF in the food industry shows that benefits outweigh risks	4	1	5	3.60
7	The use of GMF in food production creates the feeling of anxiety among the manufacturers in the food industry	4	1	5	2.77
8	The use of GMF in food production will harm the performance of food industry	4	1	5	3.35

9	The use of GMF in food production will lead to the long-term bad effect towards food industry	4	1	5	3.19
10	The use of GMF in food production will lower the productivity of food industry	4	1	5	3.51
11	The use of GMF in food production will impact the overall risk magnitude towards daily operation of food industry	4	1	5	3.44
12	I would trust the government authorities or agencies in relation to communicate on the risk for the use of GMF in the food production	3	2	5	3.49
13	I would trust the Malaysian Ministry of Health in relation to communicate on the risk for the use of GMF in the food production	3	2	5	3.43
14	I would trust the Malaysian Agriculture Research and Development Institute (MARDI) in relation to communicate on the risk for the use of GMF in the food production	3	2	5	3.67
15	I would trust the Ministry of Natural Resources and Environment (NRE) in regards to communicate on the risk for the use of GMF in the food production	4	1	5	3.43
16	I would trust the Malaysian Islamic Development Department (JAKIM) in regards to communicate on the risk for the use of GMF in the food production	4	1	5	3.33
17	I would trust Malaysian Public Universities due to its responsibility to handle new research in regards to communicate on the risk for	3	2	5	3.75

	the use of GMF in the food production				
18	In the food industry, GMF is contrary to the conventional food because it contains genes	4	1	5	3.29
19	Enzymes are used in all foods	4	1	5	2.88
20	All bacteria found in food is harmful	4	1	5	3.65
21	Some protein found in foods can be toxic	4	1	5	2.72
22	Natural does not necessarily mean healthy	3	1	4	2.52
23	All processed foods in the food industry are made by using GM products	4	1	5	2.39
24	Most of the customers eat DNA everyday	4	1	5	2.96
25	To be healthy, food should be sterile before it is eaten	4	1	5	3.37
26	There is no laws or regulations on the use of GMF in the food industry	4	1	5	3.48

4.5.2 Mean and Range Analysis for Industry Strategy

Table 4.6 showed the result of mean and range analysis which represented the independent variable namely industry strategy. As indicated from the table below, the mean value of all items were not the same, in which ranging from the lowest value of 2.49 to the highest value of 3.93. In the meantime, each item did not share the same value of range, in which differ between 3 and 4. Besides, it is shown that the maximum value for all items of this independent variable was 5, except for the sixth item was not same with the value of 4. The minimum value of industry strategy was between 1 and 2.

Table 4.6
Mean and Range Analysis for Industry Strategy

No	Items	Range	Minimum	Maximum	Mean
1	GMF is a key factor for the survival of food industry	4	1	5	3.29
2	GMF represents a new opportunity for the business of food industry	4	1	5	3.85
3	GMF is important to the development of food industry	4	1	5	3.73
4	GMF would jeopardize the profits of food industry	4	1	5	2.52
5	Investing in GMF can lead to competitive advantage in the food industry	4	1	5	3.93
6	The use of GMF in the food production requires establishment of new strategies even they are risky for the food industry	3	1	4	2.49
7	An implementation new strategies for the use of GMF in the food industry are financially risky	4	1	5	2.99
8	GMF usage in the food production shows that food industry can quickly respond to the changes in customer demand	4	1	5	3.33
9	GMF usage in the food production shows that food industry can quickly expand into latest or global competitive market	3	2	5	3.72
10	GMF represents lower product price in the food industry as a response to changes in competitor's price	4	1	5	3.28
11	GMF usage requires food industry to develop and utilize new or advanced technology to produce faster production process	4	1	5	3.49
12	GMF represents more contemporary and attractive product towards food industry	3	2	5	3.77

13	The use of GMF in the food production shows that food industry can create product variety or differentiation	3	2	5	3.80
14	Our major supplier can easily and positively respond towards GMF usage in increasing production volume in the food industry	4	1	5	3.37
15	GMF represents that food industry can quickly and easily switch to new supplier to produce lower production cost, better quality and improved delivery time	4	1	5	3.08

4.5.3 Mean and Range Analysis for Regulation

This section elaborated the mean and range analysis of regulation. There were eighteen items have been analyzed. In accordance with the table 4.7, it can be concluded that the highest mean value came from item number ten, which was 3.65. Otherwise, the lowest mean value was 2.73, which derived from the item number eleven. Moreover, it is reported that all items contained the range value of 4 and this was excepted to the item number 5, which was 3. The maximum value of all items was the same, in which known as 5. It was also articulated that the minimum value for all of this regulation's item ranging between 1 and 2.

Table 4.7
Mean and Range Analysis for Regulation

No	Items	Range	Minimum	Maximum	Mean
1	The approval procedure of GMF regulation is not available in the food industry	4	1	5	3.32

2	The regulation of GMF in the food industry is a mandatory approval process but no enforcement has been imposed until this moment	4	1	5	2.77
3	The regulation of GMF in the food industry is a mandatory approval process that adopting substantial equivalence principle	4	1	5	3.21
4	The regulation of GMF in the food industry is a mandatory approval process that adopting the precautionary principle	4	1	5	2.99
5	The food industry does not involved in the approval process of GMF regulation due to GM free-country	3	2	5	3.60
6	The risk analysis of GMF regulation is not available in the food industry	4	1	5	3.23
7	In the food industry, the risk assessment has been proposed but no enforcement has been made until this moment	4	1	5	2.79
8	In the food industry, the risk assessment is a mandatory	4	1	5	3.47
9	The food industry does not implement risk assessment due to Genetically Modified (GM) free-country	4	1	5	3.25
10	In the food industry, the labelling policies is not available	4	1	5	3.65
11	The food industry is adopting the voluntary GM labelling	4	1	5	2.73
12	The food industry is adopting the mandatory GM label with the threshold more than 1 percent	4	1	5	2.91
13	The food industry is adopting the mandatory GM label with the threshold equal or less than 1 percent	4	1	5	2.88
14	The food industry does not involved with labelling policies due to GM free-country	4	1	5	3.43
15	In the food industry, the traceability of GM is not	4	1	5	3.27

	available				
16	In the food industry, the traceability of GM is far from the enforcement	4	1	5	3.04
17	In the food industry, the traceability of GM is a mandatory	4	1	5	3.21
18	The food industry does not implement the traceability due to GM free-country	4	1	5	3.56

4.5.4 Mean and Range Analysis for Attitude

Accordingly, seventeen items were analyzed for the independent variable of attitude. Each of these items were analyzed through mean and range with the different values. As depicted in Table 4.8, item number twelve known as the highest mean value of 3.91. In contrary, the eleventh item which indicated "the use of GMF in the food industry is controllable" was the lowest mean value of 2.95. Apart from that, nine items comprised the range value of 3 and another balance of eight items were 4. Besides, each item shares the same maximum value of 5 whereas the minimum value differs between 1 and 2.

Table 4.8
Mean and Range Analysis for Attitude

No	Items	Range	Minimum	Maximum	Mean
1	The application of GM in the food production is extremely bad	4	1	5	3.60
2	The application of GM in the food production is extremely good	4	1	5	3.40
3	The application of GM in the food production is extremely foolish	3	2	5	3.71
4	The application of GM in the food production is extremely wise	3	2	5	3.51
5	The food industry strongly accept for the application of GMF in the	4	1	5	3.48

	food production				
6	The food industry strongly rejects for the application of GMF in the food production	3	2	5	3.48
7	GMF is easy to be known by the manufacturer in the food industry	3	2	5	3.32
8	GMF is easy to be judged by the manufacturer in the food industry	3	2	5	3.19
9	GMF is difficult to be judged by the manufacturer in the food industry	4	1	5	3.20
10	An effect of applying GMF in the food production was known by the food industry	3	2	5	3.12
11	The use of GMF in the food industry is controllable	4	1	5	2.95
12	The use of GMF in the food industry requires more rigorous Research & Development (R&D)	3	2	5	3.91
13	GMF should be commercialized in the food industry	3	2	5	3.53
14	The use of GMF in the food industry should be given monetary support by the government	3	2	5	3.65
15	In the food industry, the use of GMF in the food production is seen as an artificial or threaten natural order of things	4	1	5	3.05
16	In the food industry, the use of GMF in the food production is seen such leads to tamper with the nature	4	1	5	3.08
17	In the food industry, GMF makers are seen as 'playing God'	4	1	5	3.03

4.6 Goodness of Measures

As visualized in the chapter 3 in which concerning on the measures of variable, it is exposed that all measures were adapted from the previous researches or scholars.

Although all the adapted measures had been well-validated, the efficiency and effectiveness of those measures towards this GMF study require to be tested and confirmed. Prior to this goodness of measures was an initial and crucial analysis, there were several procedures or steps need to be conducted. Thus, the validity test of construct was the main procedure need to be carried out. This construct validity was performed through factor analysis. This was followed by the reliability test of all items in this research.

4.6.1 Construct Validity

Validity of items known as the extent to which the wellness of the scale's instruments measure all the items as it required to measure (Svensson, 2013). Thus, in the context of this research, the constructs were valid. This was mainly due to all adapted items were thoroughly and rigorously selected either from the empirical researches or from the theoretical aspect. However, all the adapted items were tested in the perspective of western countries, which directly opposite in the context of Malaysian studies. Therefore, in order to ensure all measurements utilized contain construct validity, the exploratory factor analysis (EFA) was undertaken to all items which measuring the construct of industry acceptance, industry strategy, regulation and attitude.

4.6.2 Exploratory Factor Analysis (EFA)

EFA is defined as an investigation of the interconnection of each variables (Pallant, 2011). There are several steps need to be fulfilled before performing EFA. Firstly, the assumptions such as sample size, normality of data, outliers, number of variables and

linearity should be met (Pallant, 2011; Yong & Pearce, 2013). Hence, as indicated by De Winter, Dodou, and Wieringa, (2009) as well as Williams, Brown, and Onsman (2012), the minimum sample size required to conduct EFA is 50. Since the usable sample size of this study was 75, there was no violation of the assumption for the sample size. There was also no violation of the assumption for data normality and outliers due to the data of this study were normally distributed and removed all the outliers. Beside that, in performing EFA, it should have at least 3 variables (Tabachnick & Fidell, 2007). Due to this study was came out with 4 variables, it directly met the assumption of EFA. Moreover, the linearity among cases was shown in the following table :

Table 4.9
Linearity Test

Variable	**Deviation from Linearity**		**Result**
	Z	**Significant**	
Industry Strategy with Industry Acceptance	2.422	0.006	Non-linear
Regulation with Industry Acceptance	1.339	0.197	Linear
Attitude with Industry Acceptance	0.762	0.769	Linear

Based on the result gained through the table of linearity test (Table 4.9), it is shown that there were two variables namely regulation and attitude have linearity with industry acceptance whereby the significant value for each variables exceeded 0.05 ($p>0.05$). Otherwise, industry strategy has not had a linearity with industry acceptance as significant value less than 0.05 ($p<0.05$). This issue caused by two reasons. 1) Sample size affects linearity (Pallant, 2011). As explained by Hussin, Ali, and Noor (2014), the most preferable sample size to conduct EFA was 100 and above. However, in the context

of this study, 75 sample size was achieved the minimum requirement but do not achieve the preferable amount of sample size. Thus, this led to the non-linear relationship between industry strategy and acceptance. 2) Despite all adapted items of industry strategy were validated by the previous researchers, GMF study was a new topic which limits the respondents to provide the exact answer. This was mainly due to the respondents were not have a lot of knowledge about the actual concept and development of modern biotechnology which emphasized on GMF (Amin et al., 2013). Consequently, non-linear relationship of industry strategy and industry acceptance was triggered. Hence, the EFA for this GMF study was proceeded to be performed such shown in the following subsection (4.6.2.1 to 4.4.2.4).

Secondly, instead of those aforementioned assumptions, there were several statistical assumptions in factor analysis taken into consideration before performing EFA in order to ensure the appropriateness of factor analysis. In accordance with that, Hair et al. (2010) exposed several steps involved. First, the value of a Measure of Sampling Adequacy (MSA) of each individual item should be more than 0.50. Second, the minimum acceptable value of Kaiser-Meyer Olkin (KMO) should be 0.50 and above. Third, in presenting the adequacy of correlations between variables as well as providing a reasonable basis of factor analysis, the value of Barlett test should be significant at ($p<0.05$). There were four factor analyses conducted separately for both independent and dependent variables in this study. Fourth, the significant value of Eigenvalue factor should be 1 or higher than 1. Fifth, the percentage of criterion variance shall be counted upon completion determining the Eigenvalue factor. Basically, the acceptable amount of total variance for the social science study is 60% and above. Sixth, in achieving a simple

structure and showing a meaningful factor pattern, the Varimax Rotation required to be performed for the purpose of extracting factor accounts of the variance. Seventh, the acceptable factor loading value to be assigned as significant is 0.50 (Hair, Black, Babin, Anderson, & Tatham, 2006). Therefore, the threshold value of factor loading for this study was 0.50.

4.6.2.1 Factor Analysis of Industry Acceptance

EFA was performed on twenty-six items measuring industry acceptance of this study. KMO value was 0.720, in which exceeding the acceptable value of 0.50. Bartlett Sphericity Test was reported to be significant (p=0.000).

Further, the test of the MSA for each item ranged between 0.506 to 0.890 as illustrated in Appendix D. However, two items (IA17 and IA25) have been deleted due to MSA values were not exceeded 0.50 whereas another two items (IA19 and IA23) have been removed due to factor loading values were less than 0.50. Consequently, as exhibited in table 4.10, the remaining items of significant factor loading ranged from 0.573 to 0.879.

Furthermore, the result of the Varimax Rotated Analysis showed the existence of four factors with Eigenvalue greater than 1, which explained by 74.03% of the variance in this data.

Table 4.10
Factor Analysis for Industry Acceptance

No	Items	Factor Loadings
IAPB 2	The use of GMF in food production would help to increase the productivity of food industry and will be a good contributor for the fight against food shortage	**0.864**
IAPB 5	The use of GMF in food production would help food industry to be remained long lasting with another competitive industry	**0.849**
IAPB 3	The use of GMF in food production will increase food industry's performance	**0.795**
IAPB 1	In the long run, the use of GMF in the food industry would be a good contributor for the Malaysian economy and society	**0.789**
IAPB 4	The use of GMF in food production will enhance the quality of product in the food industry	**0.714**
IAPB 6	An acceptance for the use of GMF in the food industry shows that benefits outweigh risks	**0.699**
IAPR 8	The use of GMF in food production will harm the performance of food industry	**0.879**
IAPR 9	The use of GMF in food production will lead to the long-term bad effect towards food industry	**0.840**
IAPR 10	The use of GMF in food production will lower the productivity of food industry	**0.829**
IAPR 11	The use of GMF in food production will impact the overall risk magnitude towards daily operation of food industry	**0.738**
IAPR 7	The use of GMF in food production creates the feeling of anxiety among the manufacturers in the food industry	**0.735**

IAT 15	I would trust the Ministry of Natural Resources and Environment (NRE) in regards to communicate on the risk for the use of GMF in the food production	**0.873**	
IAT 13	I would trust the Malaysian Ministry of Health in relation to communicate on the risk for the use of GMF in the food production	**0.852**	
IAT 14	I would trust the Malaysian Agriculture Research and Development Institute (MARDI) in relation to communicate on the risk for the use of GMF in the food production	**0.805**	
IAT 12	I would trust the government authorities or agencies in relation to communicate on the risk for the use of GMF in the food production	**0.784**	
IAT 16	I would trust the Malaysian Islamic Development Department (JAKIM) in regards to communicate on the risk for the use of GMF in the food production	**0.640**	
IAK 22	Natural does not necessarily mean healthy		**0.783**
IAK 21	Some protein found in foods can be toxic		**0.729**
IAK 20	All bacteria found in food is harmful		**0.700**
IAK 18	In the food industry, GMF is contrary to the conventional food because it contains genes		**0.747**
IAK 26	There is no laws or regulations on the use of GMF in the food industry		**0.721**
IAK 24	Most of the customers eat DNA everyday		**0.573**
% of variance			74.03
Kaiser-Meyer-Olkin (KMO)			0.720
Bartlett Sphericity Test			1004.799
df			231
Sig			0.000

4.6.2.2 Factor Analysis of Industry Strategy

To examine the validity of industry strategy, an EFA through Principle Component and Varimax Rotation Analysis was carried out to all of 15 items. As visualized in the table 4.11 below, KMO value was 0.779. This was directly significant (p=0.000) to the value of Bartlett Sphericity Test.

In contrary, there were three items of industry strategy removed. This was mainly due to several reasons. Firstly, one item (IS7) was deleted due to MSA value not exceed than 0.50. Secondly, IS4 as well as 1S11 have been removed due to factor loading value lower than 0.50.

As a result, the remaining items comprised of the MSA value ranged between 0.641 to 0.897 as shown in the Appendix E. The result of factor analysis divided in two factors with Eigenvalue greater than 1, which exposed by 72.77% of the variance. In addition, the remaining items of significant factor loading of industry strategy ranged from 0.564 to 0.961.

Table 4.11
Factor Analysis for Industry Strategy

No	Items	Factor Loading	
ISMI 5	Investing in GMF can lead to competitive advantage in the food industry	**0.885**	
ISMI 2	GMF represents a new opportunity for the business of food industry	**0.871**	
ISMI 3	GMF is important to the development of food industry	**0.843**	
ISMI 1	GMF is a key factor for the survival of food industry	**0.961**	
ISRP 12	GMF represents more contemporary and attractive product towards food industry		**0.822**
ISRP 13	The use of GMF in the food production shows that food industry can create product variety or differentiation		**0.808**
ISRP 8	GMF usage in the food production shows that food industry can quickly respond to the changes in customer demand		**0.696**
ISRP 9	GMF usage in the food production shows that food industry can quickly expand into latest or global competitive market		**0.655**
ISRP 15	GMF represents that food industry can quickly and easily switch to new supplier to produce lower production cost, better quality and improved delivery time		**0.869**
ISRP 14	Our major supplier can easily and positively respond towards GMF usage in increasing production volume in the food industry		**0.832**
ISRP 10	GMF represents lower product price in the food industry as a response to changes in competitor's price		**0.564**
ISRP 6	The use of GMF in the food production requires establishment of new strategies even they are risky for the food industry		**0.819**
% of variance			72.77
Kaiser-Meyer-Olkin (KMO)			0.779
Bartlett Sphericity Test			421.243
df			66
Sig			0.000

4.6.2.3 Factor Analysis of Regulation

An EFA was implemented on eighteen items of regulation. Nevertheless, three items of RG11, RG12, RG13 were removed because of the factor loading value lower than 0.50. Therefore, it is shown that out of eighteen items, fifteen items has been retained as significant values.

Hence, the result shown in the following table 4.12 indicated that KMO value was 0.769. The Bartlett Sphericity Test was stated to be significant (p=0.000). Meanwhile, the MSA value for each regulation items was ranged from 0.533 to 0.880. The total variance explained by the construct was 66.01%, in which extracted factor's Eigenvalue of higher than 1.

Moreover, the factor analysis result explained by four factors which supported by the derivation of four factors in rotated components such shown in Appendix F. Besides, the SPSS output of factor loading below constituting the remaining items of regulation which ranging from 0.679 to 0.932.

Table 4.12
Factor Analysis for Regulation

No	Items	Factor Loading
RGAP 4	The regulation of GMF in the food industry is a mandatory approval process that adopting the precautionary principle	**0.932**
RGAP 3	The regulation of GMF in the food industry is a mandatory approval process that adopting substantial equivalence principle	**0.762**
RGAP 5	The food industry does not involved in the approval process of GMF regulation due to GM free-country	**0.818**

RGAP 1	The approval procedure of GMF regulation is not available in the food industry	**0.880**			
RGAP 2	The regulation of GMF in the food industry is a mandatory approval process but no enforcement has been imposed until this moment	**0.847**			
RGRA 9	The food industry does not implement risk assessment due to Genetically Modified (GM)free-country		**0.923**		
RGRA 6	The risk analysis of GMF regulation is not available in the food industry		**0.913**		
RGRA 7	In the food industry, the risk assessment has been proposed but no enforcement has been made until this moment		**0.823**		
RGRA 8	In the food industry, the risk assessment is a mandatory		**0.822**		
RGL 14	The food industry does not involved with labelling policies due to GM free-country			**0.797**	
RGL 10	In the food industry, the labelling policies is not available			**0.679**	
RGTC 17	In the food industry, the traceability of GM is a mandatory				**0.899**
RGTC 18	The food industry does not implement the traceability due to GM free-country				**0.735**
RGTC 16	In the food industry, the traceability of GM is far from the enforcement				**0.890**
RGTC 15	In the food industry, the traceability of GM is not available				**0.711**
% of variance					66.01
Kaiser-Meyer-Olkin (KMO)					0.769
Bartlett Sphericity Test					657.462
df					105
Sig					0.000

4.6.2.4 Factor Analysis of Attitude

In examining the validity of attitude in this study, an EFA through a Principle Component with Varimax Rotation Analysis was undertaken on all of seventeen items. However, this analysis requires deletion of two items (AT6 and AT9) led by factor loading values smaller than 0.50.

Subsequently, as illustrated in Table 4.13, the KMO value was 0.754 which exceeding the acceptable value of 0.50. The Bartlett Sphericity Test was also found to be significant (p=0.000). In addition, the MSA value falls in the acceptable range between 0.603 to 0.889 as exhibited in Appendix G.

Further, the total variance explained by the construct of attitude was 71.05% , in which extracted by the four factors of Eigenvalue higher than 1. Hence, the following table showed that the remaining items of significant factor loading, ranging from 0.593 to 0.921.

Table 4.13
Factor Analysis for Attitude

No	Items	Factor Loading
ATGA 2	The application of GM in the food production is extremely good	**0.872**
ATGA 1	The application of GM in the food production is extremely bad	**0.845**
ATGA 5	The food industry strongly accept for the application of GMF in the food production	**0.742**
ATGA 3	The application of GM in the food production is extremely foolish	**0.717**

ATGA 4	The application of GM in the food production is extremely wise	**0.716**			
ATF 8	GMF is easy to be judged by the manufacturer in the food industry		**0.814**		
ATF 7	GMF is easy to be known by the manufacturer in the food industry		**0.781**		
ATF 11	The use of GMF in the food industry is controllable		**0.880**		
ATF 10	An effect of applying GMF in the food production was known by the food industry		**0.668**		
ATE 12	The use of GMF in the food industry requires more rigorous Research & Development (R&D)			**0.742**	
ATE 13	GMF should be commercialized in the food industry			**0.599**	
ATE 14	The use of GMF in the food industry should be given monetary support by the government			**0.593**	
ATMC 16	In the food industry, the use of GMF in the food production is seen such leads to tamper with the nature				**0.921**
ATMC 17	In the food industry, GMF makers are seen as 'playing God'				**0.898**
ATMC 15	In the food industry, the use of GMF in the food production is seen as an artificial or threaten natural order of things				**0.865**

% of variance	71.05
Kaiser-Meyer-Olkin (KMO)	0.754
Bartlett Sphericity Test	648.574
df	105
Sig	0.000

4.7 Reliability Analysis

In accordance with the result derived through factor analysis, the reliability analysis was carried out to determine the extent to which scale consistently reflects the construct it is measuring (Kumar et al., 2013). This scale reliability was measured by using Cronbach's alpha value in order to determine the internal consistency of each item (Hussin et al., 2014). The Cronbach's alpha value ranging from 0 to 1, in which resulting to higher internal consistency when the value of Cronbach's alpha closer to the 1 (Coakes, 2013; Sekaran, 2010).

Hence, it is indicated that there are three categories of Cronbach's alpha value has been utilized to describe the reliability of items. First, the Cronbach'alpha which exceeding 0.50 is claimed as acceptable value (Bowling, 2002; Streiner & Norman, 1995). Second, the Cronbach alpha value should be 0.7 or greater to indicate as strong internal consistency (Hair et al., 2010; Nunnally, 1978). However, Hair et al. (2010) elaborated that it is considered as a high level of redundancy for the item which came from the cronbach's alpha value of more than 0.90. Thus, the following Table 4.26 exhibited the result of reliability analysis for each factor in this study.

Table 4.14
Statistical Summary of Reliability Analysis

No	Variable	Number of Item	Cronbach's Alpha
1	Industry Acceptance	22	0.761
2	Industry Strategy	12	0.809
3	Regulation	15	0.696
4	Attitude	15	0.838

Based on the result provided in table 4.15, industry acceptance, industry strategy as well as attitude were considered as having strong internal consistency with the Cronbach's alpha of 0.761, 0.809 and 0.838. Besides, the construct of regulation was 0.696, in which matching to the minimum value of reliability as recommended by the aforementioned author namely Bowling (2002) as well as Streiner and Norman (1995). Simultaneously, the reliability analysis implemented on all items exposed that all construct or measurement was inherently reliable and internally consistent.

4.8 Correlation Analysis

As explained by the scholars namely Sekaran and Bougie (2009), the direction, strength as well as significance of the relationship for each variable is best measured and explained by utilizing correlation analysis. Referring to the context of this study, in which the objective was focusing on the acceptance of GMF among the Malaysian food industries. Therefore, in accordance with the research questions and research objectives of this study (Chapter 1), the Pearson correlation is the best analysis to examine the hypotheses and achieve the objectives of this research.

Pearson correlation (r) or known as Pearson product-moment coefficient is a correlation statistics which commonly utilized for a normal distribution of data (Meyers et al., 2006). Besides, this (r) is designated to examine the relationship among variables instead of identify the relation of linear direction for two variables. This relationship is determined based on the correlation's significance as well as strength (Sekaran & Bougie, 2013). Therefore, the strength and the extent to which relationship of each variable is seen through (r) value. The closer (r) value to +1.00 resulting perfect or strong positive linear

relationship, whereas the value closer to -1.00 indicating strong negative linear relationship. Otherwise, (r) value of 0 considered as no relationship at all (Kumar et al., 2013). Hence, Corder and Foreman (2009) demonstrated the relationship between two variables either it is a high, moderate or low level of strength by using correlation coefficient as shown in the following Table 4.15.

Table 4.15
Correlation Coefficient Strength

R	Strength of Relationship
r = 0.10 to 0.29 or r = -0.10 to -0.29	Low
r = 0.30 to 0.49 or r = -0.30 to -0.49	Moderate
r = 0.50 to 1.0 or r = -0.50 to -1.0	High

4.8.1 The Relationship of GMF towards Industry Acceptance

This subsection explained the hypotheses testing related to this study. Thus, the relationship of GMF which comprised of industry strategy, regulation and attitude towards industry acceptance were clearly elaborated through hypotheses testing in this study. Hence, (r) was utilized in formulating and interpreting three hypotheses as follows.

Hypothesis 1 : There's an increase acceptance among the food industries through the implementation or support of proper strategy

The above hypothesis indicated that industry strategy has a positive relationship with industry acceptance (Sung & Hwang, 2013). The relationship of industry strategy towards industry acceptance was tested by utilizing (r). As presented in Table 4.16, there was a weak positive correlation between industry strategy and industry acceptance, which was statistically positive significant of $r = 0.277$ and $p = 0.01$. Besides, the shared variance for both of these variables was 7.7 %. As a result, this hypothesis is supported.

Table 4.16
Correlation of Industry Strategy

		Industry Acceptance
Industry Strategy	Pearson Correlation (r)	0.277**
	Sig (1-Tailed)	0.008
	Variance	0.077
	N	75

** Correlation is significant at the 0.01 level (1-tailed)

Hypothesis 2 : There's an increase acceptance among the food industries through the implementation or support of systematic regulatory system

Hypothesis 2 explained that regulation has a positive relationship with industry acceptance such being supported by previous scholar namely (Mitra et al., 2011). The following table 4.17 indicated that correlation between regulation as well as industry acceptance, which was positively significant. The (r) value between these two variables was 0.249 resulting weak or low strength of relationship at $p < 0.05$. This circumstance directly supported the hypotheses. In fact, 6.2% of the variance derived from the regulation matched in explaining the score of respondents towards industry acceptance.

Table 4.17
Correlation of Regulation

		Industry Acceptance
Regulation	Pearson Correlation	0.249*
	Sig (1-Tailed)	0.015
	Variance	0.062
	N	75

* Correlation is significant at the 0.05 level (1-tailed)

Hypothesis 3 : There's an increase acceptance among the food industries through the feedback or response of positive attitude

This hypothesis 3 stated that attitude has a positive relationship with industry acceptance, in which aligned with the past scholar namely Costa-Font and Jose (2012). In accordance with the Table 4.18, there was a strong positive correlation between attitude and industry acceptance. The correlation for these two variables were 0.554 at $p < 0.05$. Moreover, the variance percentage for both variables was about 30.7. Thus, this clearly indicated that the hypothesis was supported.

Table 4.18
Correlation of Attitude

		Industry Acceptance
Attitude	Pearson Correlation	0.554**
	Sig (1-Tailed)	0.000
	Variance	0.307
	N	75

*Correlation is significant at the 0.05 level (1-tailed)

4.9 Summary of Hypotheses Testing

Hypotheses testing to all variables completely done. Therefore, the result visualized that most of the hypotheses of the studied variables were supported. In fact, none of the hypothesis was rejected. Further, the result or finding of the tested hypotheses shown in table 4.20 as follows :

Table 4.19
Result Summary of Hypotheses Testing

No	Hypotheses	Findings
H_1	There's an increase acceptance among the food industries through the implementation or support of proper strategy	Supported
H_2	There's an increase acceptance among the food industries through the implementation or support of systematic regulatory system	Supported
H_3	There's an increase acceptance among the food industries through the feedback or response of positive attitude	Supported

4.10 Summary

The result in this quantitative analysis showed that the manufacturers in the selected food industry aware of the GMF appearance in current competitive market. Therefore, the acceptance of GMF among the Malaysian food industries were examined by using Pearson correlation (r). The hypotheses testing with SPSS provided empirical evidence concerning the relationship between industry strategy, regulation as well as attitude on industry acceptance. The details of these findings are discussed in chapter 5 followed by implication of the study, possible direction for future research and conclusion.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter elaborates the findings of the GMF acceptance towards food industry. It begins with a recapitulation of the study followed by a section on the summary of result. Next is section 5.4, which includes a discussion of the relationship among the research variables used to achieve the objective of this study. Subsequently, section 5.5 explains the implications of the study, which are separated into theoretical as well as practical implications. Then, section 5.6 presents the limitation of the study and followed by section 5.7, which elaborates suggestion or recommendation for future research. The conclusion is then discovered in section 5.8, which ended with the summarization of the entire chapters.

5.2 Recapitulation of the Study

The main aim of this research was to gain a deeper understanding and clear picture pertaining to the question 'Will GMF be accepted by the Malaysian food industry?' The study was specifically or narrowed down to concentrate on the objectives of this study which was to examine the relationship of industry strategy, regulation and attitude on industry acceptance.

Before collected data were examined by utilizing SPSS software, the questionnaires were sent out to the managers of the chosen food companies around Malaysia. Those questionnaires were distributed through self-administered, postal and email.

Upon completion data collection stage, the hypotheses testing was then conducted on the dependent and independent variables of this study as postulated in the conceptual framework (Figure 3.1). The dependent variable of this study was industry acceptance, which was measured by the perceived benefit, perceived risk, trust and knowledge. The industry strategy, regulation and attitude were independent variable of this study. As exposed at the beginning chapter (chapter 1) of this study, the research finding will be focused mainly on achieving the following objectives :

i. To examine the relationship of industry strategy on industry acceptance towards GMF.

ii. To examine the relationship of regulation on industry acceptance towards GMF.

iii. To examine the relationship of attitude on industry acceptance towards GMF.

5.3 Summary of Results

The main interest of this research was to examine the acceptance among the Malaysian food industries towards GMF, which gives an opportunity for the food industry to be remain in the competitive market. The result of this study exposed that industry acceptance towards GMF affected by the industry strategy, regulation and attitude. These result are aligned with the previous scholars namely Sung and Hwang (2013), Mitra et al. (2011) as well as Costa-Font & Gil (2012) who claimed that the increment of GMF acceptance among the food industries was relied on the implementation or support of proper strategy, systematic regulatory system and positive attitude.

This study found that the strategy of industry increases the acceptance of GMF among the food industries. This finding is in line with the past researchers which elaborated that the GMF will be highly accepted by the food industry when the managers or leaders on that particular industry seen GMF as one of the factors that may boost up the strategy in their business (Sung & Hwang, 2013). The strategy is a vital part in setting out the future path of the industry, which requires the establishment of long term plan, policy and procedure in order to achieve the aims and visions that have been drawn in the GMF production (Ackoff, 1990; Zahra & Covin, 1993). Besides, the implementation of well-structured strategies would drive the industry to be succeed in the aspect of its business values, operation and also performance (Normann & Ramirez, 1993).

The finding of this study also exposed that regulation was inherently able to increase industry acceptance towards GMF. This result is parallel with Kothamasi and Vermeylen, (2011) as well as Sanvido et al. (2005) who articulated that the approval processes and requirements of the regulation would determine whether the GMF be accepted or rejected in the production of food industry. All of food industries were tightened with the stringent and complex procedures or guidelines which have been regulated by the government or other authorities body (Mclntosh & Turnbull, 2006). By meeting the specification of GMF production which includes quality, safety and efficacy, would caused the food industry to market its new product development smoothly and effectively (Tait & Chataway, 2007; Tait & Williams, 1999).

Attitude was empirically proven to cause an increment of industry acceptance towards GMF. This result is consistent with Kimenju et al. (2005) who claimed that positive attitude raised up the GMF acceptance among the food industries. It is seen when the stakeholders which emphasized on food manufacturers or producer positively accept the usage and commercialization of GMF in their industry's business and operation. Basically, the manufacturers or food producers who positively feedback and response to the acceptance of GMF came from the food industries which is located in the developing countries (Hoban, 2004).

5.4 Discussion

In accordance with the result, this research clearly explained that the acceptance of GMF in the Malaysian food industries inherently increased due to the implementation or support of proper strategy, systematic regulatory system as well as positive attitude's feedback or response gained from the stakeholders (manufacturers of food producer) in the food industry. As anticipated, this result associated with the previous scholars namely Rudder (2001) Saguy and Sirotinskaya (2014) as well as Stronen (2011) who enumerated that an acceptance of GMF affects the retention of Malaysian food industries in the challenging current market, which led by the continuous transformation or complexity derived from the food industry's environment.

Research Question 1 : Does industry strategy have a relationship with the Malaysian food industry in accepting GMF?

There are many advantages for the food industry which accept GMF in its production or operation. This phenomenon affects to the remaining of an existing customer loyalty instead of producing new product creation or development in their food industries. However, it has been a challenge or complicated circumstance for the food industry in accepting the commercialization and production of GMF. There are several risks encountered by the industry such as involvement of designing new technique as well as restructuring the whole management in the industry (Doubleday, 2005; Levidow & Bijman, 2002).

Consequently, an effective and efficient strategy concerning GMF is the crucial aspect in the Malaysian food industry while accepting GMF into their business. The manufacturers and food industry are urged to oversee the current environment of its competitor before step further into GMF production, which would avoid to the industry's financial loss especially to the small food industries. Instead of identifying the targeted and size of the market, the GMF would be highly accepted by Malaysian food industries through the implementation of strategy such collaboration with other related bodies.

In aiming to earn a high revenue, it is considered as an appropriate strategy when the food industry forming a partnership with the government or authority agencies. This is proven when the Malaysian government as being allocated in the ninth Malaysia Plan provided various incentives such as financial aids, facilities, R&D as well as providing support such as mentoring and promoting the programmes related to the food industry which accepts GMF in their production.

Therefore, the food industry is also urged to properly design and develop its strategy by considering on the long term plan and the prediction of upcoming risks despite giving priority on retaining the quality of its existing product. Due to formulating or developing the strategy are critical and hardly ever to be undertaken in the industry, all the strategy will be designed and carried out by the top management of the industry. Similarly to this finding, the strategy and decision making regarding GMF production made by the high level people such as senior manager or owner of the industry in regards to their knowledge, experience and their capabilities in making the decision to the industry.

All strengths, opportunities, threats and weaknesses are the vital element required to be clarified by the industries while formulating their industry's strategy. Therefore, structured and proper strategy implementation contributed to the high acceptance of GMF among the Malaysian food industries.

Research Question 2 : Does regulation have a relationship with the Malaysian food industry in accepting GMF?

A study by Quah (2007) explained that one of the crucial causes led to the uncertainty of industry in accepting GMF into their production was due to the heavy and stringent regulatory system in Malaysia. This was mainly due to the regulation of GMF was fully monitored by the Malaysian governments and related authority agencies. Therefore, the food industry have to adhere to all rules, procedure as well as standard and requirements that have been regulated while implementing GMF commercialization.

In respect to the finding from this research, an establishment and endorsement of the systematic regulation in government institution related to the food sectors were reported to increase the acceptance of GMF among the Malaysian food industries. This is due to the fact that all GMF commercialization including internal operation and external trading which involved importation and exportation transactions could be smoothly implemented in the Malaysian food industry by complying to the fixed regulatory systems which comprised of trading, manufacturing as well as licensing.

Therefore, the manufacturers or food producers are needed to obey on the regulatory framework in Malaysia. Failure to adhere on those regulations lead to a very high cost and inherently risky condition for industry's business. In order to cope with the

stringency of government regulations such as obtaining licensing agreement, if the industry failed to meet the standard and requirement that has been regulated by the government and authority, that GMF product will be filtered out and tend to create a very long lead time of product development which may drag the duration of time for the product to be approved for another few years (Bauer & Gaskell, 1984; Jasanoff, 1995; Tait & Chataway, 2007; Tait & Williams, 1999).

In addition, the food industries would also have to be dealt with the challenges of regulatory system in Malaysia still at the infant stage. This was affected by few modifications of labelling regulation and the establishment of Food Act in just a few years back. However, the food industry have to comply with the regulation that has been set up. In fulfilling the strict regulations formulated by the government, the industry will work hard to produce GMF of a high quality which is accepted by the government authorities and another food industries.

Therefore, the government agencies are suggested to provide the concrete and systematic regulation procedure includes providing guideline and current status of the rules and policy requirements related to operation and production of the food industry. This circumstance led the food industry especially food manufacturers of producers to understand the whole rules and regulations precisely and clearly which would match the government regulation and their industry's goal. As a result, the food industry would highly increase their acceptance towards GMF production and commercialization.

Research Question 3 : Does attitude have a relationship with the Malaysian food industry in accepting GMF?

Based on the explaination provided by Amin, Jahi, and Nor (2010) which their study concerning on GMF status in Malaysia indicated that GMF commercialization has been disseminated its introduction to all over the world including Malaysia since 1998. However, not all of food industry showed positive feedback or respond in accepting GMF into their industry's production.

The food industry especially MNCs were preferably showed their negative response towards GMF commercialization or acceptance; otherwise they tend to focus on selling non-GMF product due to the manufacturers or food producers in the industry worried and sensitive towards the uncertainty of benefits and risks that may badly affect the production distribution channel in their industry.

In addition, the food manufacturers or food producers often looking forward to the values, benefits and profits resulted by accepting the GMF into their production of industry. Due to such circumstance, the food industry have a high tendency of curiosity in believing and accepting the GMF commercialization even it has been encouraged or recommended by the government or related authority bodies. This could be seen when the food manufacturers or food producers lost their trustworthiness and confidence to the new improvement or modification of new management, operation followed by strategy while accepting GMF.

Although there were several barriers distort the positive acceptance of GMF throughout food industry, the industry from the developing country such Malaysia shown an

increasing of industry acceptance through positive attitude or respond towards GMF production and commercialization; which resembles to the result of this research.

5.5 Implication of the Study

Based on the finding of this research, there were implications of the study which divided into theoretical and practical as discussed in the following section of 5.5.1 and 5.5.2.

5.5.1 Theoretical Implication

This study has impacted to the body of knowledge specifically on GMF and industry by using institutional theory in elaborating the relationship among the variables. The research has imparted an empirical evidence focusing on the relationship of industry strategy itself, systematic regulatory framework as well as attitude shown by the manufacturers or food producers towards commercialization and acceptance of GMF. In regards to the approach of industry practice which emphasized on knowledge transfer and competency of industry stressed on the employee, operation management, obligation towards regulation requirement and method or technique being employed in the industry while running routine of business. Consequently, this phenomenon led to the efficiency of industry performance as well as high acceptance of industry towards GMF.

Another theoretical contribution from this research is the support it provides an empirical evidence concerning industry acceptance towards GMF. Therefore, the result of this study has fulfilled the gap whereby previous scholars namely Bredahl et al. (1998) indicated that the result related to the acceptance of GMF was complicated in terms of

methodology and its abstraction level, which tremendously caused the lack of GMF acceptance.

Furthermore, the result of this study also provides further insight into theoretical contribution regarding the actual acceptance of GMF among the food industries in the Malaysian context. This was mainly due to the past studies tend to discuss the acceptance or rejection of GMF among the consumer's perspective throughout many western countries (House et al., 2001). Subsequently, this study has filled the gaps being exposed by Hornibrook and Fearne (2003) which claimed that research concerning on the food industry is still lacking. In fact, this study contributes a high significant impact to Malaysian context since the GMF study has been remarked as a new topic and present at a low level which is deemed important to be explained.

5.5.2 Practical Implication

The result of this study has imparted to the practical implication which plays a vital role towards the whole management and operation activities of the food industry in Malaysia. The results derived from this study assists the current food manufacturers or food producers to obtain a proper and in depth understanding related to GMF and to what extend the Malaysian food industry accept the GMF commercialization and production at this moment.

Moreover, the empirical finding of this research contributed to this practical implication by allocating the various benefits to the food industry especially food manufacturers or food producers if GMF being accepted, commercialized or utilized in their business operation. The finding of this research discovered that the acceptance of GMF contains

many advantages to the Malaysian food industry. Among of them were the enhancement of food processing features, new product differentiation in production, efficient food supplies instead of low production cost and product development. Directly, the food industry which positively accept GMF commercialization contains a high possibility in earning high profit and remaining in the challenging current market.

Besides, the result of this study also impart the food manufacturers or food producers to be alerted on the policies and procedures that should be complied by the food industry while commercializing GMF (Rollin, Kennedy & Wills, 2011). This led food manufacturers or food producers to obey on the standards and requirements that have been governed by the authority bodies. In fact, by complying with those rules, the commercialization of GMF would be undertaken systematically and not only simply apply it in the business of Malaysian food industry.

Furthermore, based on the result provided in this research, attitude known as one of the contributors among industries to accept GMF. Thus, the higher positive feedback or response shows by the food manufacturers or food producers the higher food industry accepts GMF into its production activity. This finding is aligned with the previous scholars namely Hoban (2004) which indicated that most of GMF will be accepted in developing countries. Due to Malaysia recognized as one of the developing countries, the research of GMF acceptance among the Malaysian food industries has contributed to this practical implication. Hence, in regards to the empirical evidence on this practical contribution, it is hoped that the person involved in the food production such as managers, food manufacturers or food producers would be able to obtain the actual

knowledge, phenomenon and status of GMF in Malaysia while considering the acceptance, commercialization or utilization of GMF.

5.6 Limitation of the Study

There were several limitations found through this research. First and foremost, despite the postal method, data collection were also distributed through mail. However, the major limitation encountered in facilitating response from the food industry is difficulty to get a large number of food industry's participation. This study only managed to obtain 98 questionnaires from a total of 248 questionnaires that were distributed. Due to missing data exceeded 10%, another 20 questionnaires were discarded, leaving only 78 usable questionnaires (31.45%) which were deemed fit for further analysis. Besides, location of the respondent or food industry also contributed to the limitation of this study. Earlier in the chapter 1 which emphasized on scope of the study, the targeted respondents or food industries were chosen throughout Malaysia involving 14 states. However, only 9 states returned the complete questionnaires whereas the balance of 5 states namely Pahang, Terengganu, Perlis, Sabah and Sarawak did not even respond to the distributed question. These response rate limitations happened due to this GMF study was a new area for respondents, which limits them to completely answer the questionnaire.

Another limitation in this study is the process of classifying the food industry into GMF or non-GMF food manufacturers or producers. Thus, filter question has to be designed and inserted into the questionnaire in order to detect the use of GMF or GMO in food manufacturing industries. This is mainly due to lack of formal sources discussing GMF in the Malaysian food industry. For instance, there is a dearth of food industry information

provided by the government or non-government institutions. This caused the researcher to manually classify the type of food industry using the list provided by FMM and the development of sampling frame consumed a longer time. As a conclusion, the aforementioned limitations of this study provide the suggestion for future research that shall be undertaken such posited in the following section 5.7.

5.7 Suggestion for Future Research

This section recommends the additional investigation which related to the area of this study that could be taken for further improve the finding discovered in this topic. Due to several restrictions were faced by the researcher, the following recommendations which beneficial for future research could be carried out in demolishing those limitations arise from this study.

In regards to the limitation of cross-sectional study, the future research is suggested to apply longitudinal study in testing the causality of industry strategy, regulation, attitude as well as food industry acceptance over different periods of time, which would impart a better and deeper understanding regarding this issue of GMF acceptance. Future studies are recommended to employ mix method or qualitative technique for in depth understand pertaining to the Malaysian food industry acceptance towards GMF.

Furthermore, future researches are suggested to employ other variables that may affect the acceptance of GMF among the food industries. Due to the impossibility of researcher to measure all variables in this study, the future research shall consider other predictors. The incorporation of technological support and attitude towards innovation as

independent variable should be considered by future studies. Besides, the moderating variable of GMF awareness should also be employed in the future studies.

On the other hand, more empirical researches are required to support the acceptance of GMF among the food industries. Due to the limitation in detecting which food industry is commercializing or utilizing GMF into their production, the future research should enlarge the scope of this study to increase the generalizability of research findings. The future research should widen the scope of study by inserting all food industries without distinguishing it into its business nature or type, which includes raw product of food industry, end product of food industry and not only processed food industry as conducted in this research.

In addition, this study is focused on the acceptance of GMF which based on one respondent as representative, came from the manager level for each food industry. Future studies can also examine the acceptance of GMF according each level of management which includes top, middle as well as bottom for to all food industries. Thus, a comparison pertaining to the GMF acceptance based on a different management level in the Malaysian food industry can be done. This comparative study can shed some lights to the different perspective of GMF acceptance according each level of food industry's management and operation.

In accordance with those suggestions recommended for future research, it is hoped that this study would encourage or at least stimulate interest towards future research in the similar area, as more research related to this subject is deemed necessary to widen the current knowledge especially in the Malaysian context.

5.8 Conclusion

This research has brought a contribution to the body of knowledge by providing empirical evidence regarding the relationship between GMF and industry acceptance. Although there were several limitations encountered, the hypotheses of this research have been successfully tested and interpreted. In regards to the aforementioned, this research also disclosed what are significant impacts led to the acceptance of GMF in the Malaysian food industry.

Therefore, the results of this study indicated that the strategy of the food industry itself, a proper implementation of the regulation governed by the authority bodies as well as positive attitude shown by the manufacturers were contributed to the food industry throughout Malaysia in accepting GMF into their production. Hence, this study also exposed that Malaysian food industries are positively accept GMF into their production and operation of business.

Findings derived from this study enumerated that the acceptance of GMF in the food industry would enhance the Malaysian development. This is aligned with the aspiration of Malaysian Prime Minister, Datuk Sri Najib Tun Razak in his speech during Budget 2013 indicated that the acceptance of GMF in the food industry would reduce Malaysia's dependency towards external trading instead of increasing the income of this nation.

Throughout this research, it could be seen that Malaysia has a heavy reliance on the food sectors. Due to the food industry contributed to this nation's GDP, GMF study is seen as a crucial mechanism in boosting up the Malaysia's economy and development to be aligned with nationwide.

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Appendices

Appendix A : Questionnaire

SURVEY

GENETICALLY MODIFIED FOOD IN MALAYSIA : INDUSTRY ACCEPTANCE

SITI HUSMILA BINTI HUSSIN

COLLEGE OF BUSINESS

UNIVERSITI UTARA MALAYSIA

Dear Sir/Madam Respondents,

Ref: Genetically Modified Food (GMF) In Malaysia : Industry Acceptance

Referring to the matter above, I would like to inform you that your esteem industry has been selected as one of the respondents for the above mentioned academic research. This study is mainly to establish a focus on industry acceptance of GMF in Malaysia. Your responses are crucial in helping us to understand on how and what are the main influences of GMF on Malaysian industry acceptance.

The questionnaire will take about 15-20 minutes to complete. We would appreciate it very much if you could complete the attached questionnaire and return it to us at your earliest possible.

Your answers to this questionnaire are STRICTLY CONFIDENTIAL and no individual answers can be linked back to you or your organization. The information will be used for academic purposes only.

Your participation is highly anticipated and crucial to the outcome of this study. I would also like to take this opportunity to thank you in advanced for your participation in this survey. If you have any question in respect to this study please do not hesitate to contact me at 010-2954963 or by email at husmila@gmail.com.

Thank you very much for your time and cooperation.

Yours sincerely,

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WHAT IS GENETICALLY MODIFIED FOOD (GMF)?

GMF is a food produced from the same or another organism that have had specific changes introduced into its DNA or gene using the methods of genetic engineering (GE) in order to create or enhance desirable characteristics species (Australian Department of The Environment and Heritage, 2001; Ministry of Health Malaysia, 2013)

EXAMPLE :

Rice that has been genetically modified through the insertion of Beta Carotene (Carrot) to produce golden rice with a large quantity of Vitamin A

I. SURVEY INFORMATION

This study consists of five parts, which are:

PART A: The industry acceptance measurement

PART B: Assessment of industry strategy of GMF

PART C: Assessment of GMF regulation

PART D: Assessment of Attitude towards GMF usage

PART E : Demographic information of the company and respondent

II. BRIEF DESCRIPTION OF GMF AND INDUSTRY ACCEPTANCE

This research is aimed to investigate the relationship between an acceptance of GMF and food industry in Malaysia. This is mainly due to the current situation shows that there are many food industries from other country have started to accept and commercialize GMF in their local market. Simultaneously, by focusing on the food industry which is part of manufacturing sector, it is beneficial to the income and development of Malaysia as a developing country.

However, GMF is a new topic in the context of Malaysian food industries but very important to be discussed. Therefore, the mission of this study is to understand how and what are the influence contributes to the acceptance of GMF among the Malaysian Food industries.

Your response is highly important for the accuracy of this study. Kindly return the completed questionnaire at your earliest convenience. Should you have any enquiries, please do not hesitate to contact me at 010-2954963 or by email at husmila@gmail.com.

Thank you.

PART A: INDUSTRY ACCEPTANCE

The following questions are designed to measure the industry acceptance of GMF in the perspective of Malaysian food manufacturer. Based on the current operation and production of your industry, please indicate your opinion and understanding pertaining to industry acceptance of GMF by ticking [✓] on the answer of your choice.

PART 1 : PERCEIVED BENEFIT

		Strongly Disagree				**Strongly Agree**
		1	**2**	**3**	**4**	**5**
1APB 1	In the long run, the use of GMF in the food industry would be a good contributor for the Malaysian economy and society	☐	☐	☐	☐	☐
1APB 2	The use of GMF in food production would help to increase the productivity of food industry and will be a good contributor for the fight against food shortage	☐	☐	☐	☐	☐
1APB 3	The use of GMF in food production will increase food industry's performance	☐	☐	☐	☐	☐
1APB 4	The use of GMF in food production will enhance the quality of product in the food industry	☐	☐	☐	☐	☐
1APB 5	The use of GMF in food production would help food industry to be remained long lasting with another competitive industry	☐	☐	☐	☐	☐
1APB 6	An acceptance for the use of GMF in the food industry shows that benefits outweigh risks	☐	☐	☐	☐	☐

PART 2 : PERCEIVED RISK

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
1APR 7	The use of GMF in food production creates the feeling of anxiety among the manufacturers in the food industry					
1APR 8	The use of GMF in food production will harm the performance of food industry					
1APR 9	The use of GMF in food production will lead to the long-term bad effect towards food industry					
1APR 10	The use of GMF in food production will lower the productivity of food industry					
1APR 11	The use of GMF in food production will impact the overall risk magnitude towards daily operation of food industry					

PART 3 : TRUST

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
IAT 12	I would trust the government authorities or agencies in relation to communicate on the risk for the use of GMF in the food production					

IAT 13	I would trust the Malaysian Ministry of Health in relation to communicate on the risk for the use of GMF in the food production					
IAT 14	I would trust the Malaysian Agriculture Research and Development Institute (MARDI) in relation to communicate on the risk for the use of GMF in the food production					
1AT 15	I would trust the Ministry of Natural Resources and Environment (NRE) in regards to communicate on the risk for the use of GMF in the food production					
1AT 16	I would trust the Malaysian Islamic Development Department (JAKIM) in regards to communicate on the risk for the use of GMF in the food production					
1AT 17	I would trust Malaysian Public Universities due to its responsibility to handle new research in regards to communicate on the risk for the use of GMF in the food production					

PART 4 : KNOWLEDGE

		Strongly Disagree				**Strongly Agree**
		1	**2**	**3**	**4**	**5**
IAK 18	In the food industry, GMF is contrary to the conventional food because it contains genes					

IAK 19	Enzymes are used in all foods					
IAK 20	All bacteria found in food is harmful					
IAK 21	Some protein found in foods can be toxic					
IAK 22	Natural does not necessarily mean healthy					
IAK 23	All processed foods in the food industry are made by using GM products					
IAK 24	Most of the customers eat DNA everyday					
IAK 25	To be healthy, food should be sterile before it is eaten					
IAK 26	There are no laws or regulations on the use of GMF in the food industry					

PART B: INDUSTRY STRATEGY

The following questions are designed to evaluate the current strategy of your industry. Strongly disagree indicates your opinion is against the statement whereas strongly agree indicates your opinion is closest to the statement. Please tick [✓] on the answer of your choice to indicate the implementation of strategy in your industry.

PART 1 : MANAGERIAL INTERPRETATION

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
ISMI 1	GMF is a key factor for the survival of food industry					
ISMI 2	GMF represents a new opportunity for the business of food industry					
ISMI 3	GMF is important to the development of food industry					
ISMI 4	GMF would jeopardize the profits of food industry					
ISMI 5	Investing in GMF can lead to competitive advantage in the food industry					

PART 2 : RISK PROPENSITY

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
ISRP 6	The use of GMF in the food production requires establishment of new strategies even they are risky for the food industry					
ISRP 7	An implementation new strategies for the use of GMF in the food industry are financially risky					
ISRP 8	GMF usage in the food production shows that food industry can quickly respond to the changes in customer demand					

ISRP 9	GMF usage in the food production shows that food industry can quickly expand into latest or global competitive market					
ISRP 10	GMF represents lower product price in the food industry as a response to changes in competitor's price					
ISRP 11	GMF usage requires food industry to develop and utilize new or advanced technology to produce faster production process					
ISRP 12	GMF represents more contemporary and attractive product towards food industry					
ISRP 13	The use of GMF in the food production shows that food industry can create product variety or differentiation					
ISRP 14	Our major supplier can easily and positively respond towards GMF usage in increasing production volume in the food industry					
ISRP 15	GMF represents that food industry can quickly and easily switch to new supplier to produce lower production cost, better quality and improved delivery time					

PART C: REGULATION OF GMF

The following questions are designed to evaluate the regulation that has been fixed in your industry and country. Strongly disagree indicates your opinion is against the statement whereas strongly agree indicates your opinion is closest to the statement. Please tick [✓] to the given answer which represent the regulation that has been imposed towards your industry.

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
RGAP 1	The approval procedure of GMF regulation is not available in the food industry					
RGAP 2	The regulation of GMF in the food industry is a mandatory approval process but no enforcement has been imposed until this moment					
RGAP 3	The regulation of GMF in the food industry is a mandatory approval process that adopting substantial equivalence principle					
RGAP 4	The regulation of GMF in the food industry is a mandatory approval process that adopting the precautionary principle					
RGAP 5	The food industry does not involved in the approval process of GMF regulation due to GM free-country					
RGRA 6	The risk analysis of GMF regulation is not available in the food industry					
RGRA 7	In the food industry, the risk assessment has been proposed but no enforcement has been made until this moment					
RGRA 8	In the food industry, the risk assessment is a mandatory					
RGRA 9	The food industry does not implement risk assessment due to Genetically Modified (GM)free-country					

RGL 10	In the food industry, the labelling policies is not available					
RGL 11	The food industry is adopting the voluntary GM labelling					
RGL 12	The food industry is adopting the mandatory GM label with the threshold more than 1 percent					
RGL 13	The food industry is adopting the mandatory GM label with the threshold equal or less than 1 percent					
RGL 14	The food industry does not involved with labelling policies due to GM free-country					
RGTC 15	In the food industry, the traceability of GM is not available					
RGTC 16	In the food industry, the traceability of GM is far from the enforcement					
RGTC 17	In the food industry, the traceability of GM is a mandatory					
RGTC 18	The food industry does not implement the traceability due to GM free-country					

PART D: ATTITUDE TOWARDS GMF USAGE

The following questions are designed to evaluate the attitude of GMF usage. Strongly disagree indicates your opinion is absolutely against the statement whereas strongly agree indicates your opinion inherently closest to the statement. Please tick [✓] to the following answer that indicates your attitude towards GMF usage in your industry.

		Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
ATGA 1	The application of GM in the food production is extremely bad					
ATGA 2	The application of GM in the food production is extremely good					
ATGA 3	The application of GM in the food production is extremely foolish					
ATGA 4	The application of GM in the food production is extremely wise					
ATGA 5	The food industry strongly accept for the application of GMF in the food production					
ATGA 6	The food industry strongly reject for the application of GMF in the food production					
ATF 7	GMF is easy to be known by the manufacturer in the food industry					
ATF 8	GMF is easy to be judged by the manufacturer in the food industry					
ATF 9	GMF is difficult to be judged by the manufacturer in the food industry					
ATF 10	An effect of applying GMF in the food production was known by the food industry					
ATF 11	The use of GMF in the food industry is controllable					
ATE 12	The use of GMF in the food industry requires more rigorous Research & Development (R&D)					

ATE 13	GMF should be commercialized in the food industry	☐	☐	☐	☐	☐
ATE 14	The use of GMF in the food industry should be given monetary support by the government	☐	☐	☐	☐	☐
ATMC 15	In the food industry, the use of GMF in the food production is seen as an artificial or threaten natural order of things	☐	☐	☐	☐	☐
ATMC 16	In the food industry, the use of GMF in the food production is seen such leads to tamper with the nature	☐	☐	☐	☐	☐
ATMC 17	In the food industry, GMF makers are seen as 'playing God'	☐	☐	☐	☐	☐

PART E : DEMOGRAPHIC INFORMATION

1. What is your position in your company?

Senior Manager ☐ Middle Manager ☐

First Line Manager ☐ Others. Please State : _____

2. What is your department/job function in the company?

Information Technology	☐	Sales/Marketing	☐
Finance/Accounting	☐	Customer Service	☐
Human Resources	☐	Administration/ Owner	☐
Operation	☐	Others. Please State : _____	

3. How long have you been in the food industry?

Less than 1 year	☐	1-3 years	☐
4-5 years	☐	5-10 years	☐
More than 10 years	☐		

4. What is your highest education?

Primary School	☐	Secondary School	☐
Tertiary/College/University	☐	No Formal Education	☐

5. What type of ownership in your industry ?

Multinational Companies (MNCs)	☐	Local Industry	☐
Joint Venture	☐	Others. Please State : - _____	

6. Where is your industry's location ?

Penang	☐	Kuala Lumpur	☐	Johor	☐
Kedah	☐	Selangor	☐	Pahang	☐
Perak	☐	Negeri Sembilan	☐	Terengganu	☐
Perlis	☐	Melaka	☐	Kelantan	☐
Sabah	☐	Sarawak	☐		

7. How many workers are in your company?

Less than 10 workers	☐	31-40 workers	☐
11-20 workers	☐	41-50 workers	☐
21-30 workers	☐	More than 50 workers	☐

8. What is average profit level of your industry?

Less than RM 10 millions	☐	More than RM 25 millions	☐
RM 10 – RM 25 millions	☐		

9. Do you know what GMF is ?

Yes	☐	No	☐

COMMENT AND SUGGESTION

-

THANK YOU VERY MUCH

Appendix B : Normality Test

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IndustryAcceptance	75	3.3383	.31394	-.320	.277	-.471	.548
IndustryStrategy	75	3.3778	.37861	-.293	.277	-.325	.548
Regulation	75	3.1837	.29397	.151	.277	-.700	.548
Attitude	75	3.3647	.45007	-.342	.277	.062	.548
Valid N (listwise)	75						

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IndustryAcceptance	.119	75	.010	.980	75	.280
IndustryStrategy	.118	75	.012	.971	75	.080
Regulation	.121	75	.009	.975	75	.151
Attitude	.080	75	.200*	.970	75	.068

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix C : Mean and Range Analysis

1. Industry Acceptance

Statistics

		IA1	IA2	IA3	IA4	IA5	IA6	IA7	IA8	IA9	IA10	IA11	IA12	IA13	IA14	IA15	IA16	IA17	IA18	IA19	IA20	IA21	IA22	IA23	IA24	IA25	IA26
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.64	3.87	3.64	3.67	3.77	3.60	2.77	3.35	3.19	3.51	3.44	3.49	3.43	3.67	3.43	3.33	3.75	3.29	2.88	3.65	2.72	2.52	2.39	2.96	3.37	3.48
Std. Deviation		.880	.949	.832	.963	.967	.838	1.008	1.020	1.159	1.045	1.093	.812	.791	.811	1.055	1.057	.807	.851	.885	.937	.863	.875	1.077	.951	.897	1.018
Range		4	4	4	4	4	4	4	4	4	4	4	3	3	3	4	4	3	4	4	4	4	3	4	4	4	4
Minimum		1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5

2. Industry Strategy

Statistics

		IS1	IS2	IS3	IS4	IS5	IS6	IS7	IS8	IS9	IS10	IS11	IS12	IS13	IS14	IS15
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.29	3.85	3.73	2.52	3.93	2.49	2.99	3.33	3.72	3.28	3.49	3.77	3.80	3.37	3.08
Std. Deviation		.997	.849	.963	.811	.920	.795	1.072	.827	.627	.763	.950	.815	.753	.897	.882
Range		4	4	4	4	4	3	4	4	3	4	4	3	3	4	4
Minimum		1	1	1	1	1	1	1	1	2	1	1	2	2	1	1
Maximum		5	5	5	5	5	4	5	5	5	5	5	5	5	5	5

3. Regulation

Statistics

		RG1	RG2	RG3	RG4	RG5	RG6	RG7	RG8	RG9	RG10	RG11	RG12	RG13	RG14	RG15	RG16	RG17	RG18
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.32	2.77	3.21	2.99	3.60	3.23	2.79	3.47	3.25	3.65	2.73	2.91	2.88	3.43	3.27	3.04	3.21	3.56
Std. Deviation		1.067	.894	.934	.951	.959	1.158	.810	.811	1.116	.966	.920	.825	1.052	1.232	1.107	.979	.990	1.003
Range		4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4
Minimum		1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

4. Attitude

Statistics

		AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.60	3.40	3.71	3.51	3.48	3.48	3.32	3.19	3.20	3.12	2.95	3.91	3.53	3.65	3.05	3.08	3.03
Std. Deviation		.986	.900	.693	.921	.921	.921	.720	.730	.870	.677	.914	.791	.777	.979	.943	.866	.854
Range		4	4	3	3	4	3	3	3	4	3	4	3	3	3	4	4	4
Minimum		1	1	2	2	1	2	2	2	1	2	1	2	2	2	1	1	1
Maximum		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Appendix D : Factor Analysis of Industry Acceptance

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.720
Bartlett's Test of Sphericity	Approx. Chi-Square	1004.799
	df	231
	Sig.	.000

Communalities

	Initial	Extraction
IA1	1.000	.780
IA2	1.000	.727
IA3	1.000	.789
IA4	1.000	.743
IA5	1.000	.714
IA6	1.000	.541
IA7	1.000	.708
IA8	1.000	.797
IA9	1.000	.802
IA10	1.000	.796
IA11	1.000	.695
IA12	1.000	.709
IA13	1.000	.807
IA14	1.000	.749
IA15	1.000	.828
IA16	1.000	.674
IA18	1.000	.738
IA20	1.000	.776
IA21	1.000	.804
IA22	1.000	.760
IA24	1.000	.562
IA26	1.000	.863

Extraction Method: Principal Component Analysis.

Anti-image Matrices

		IA1	IA2	IA3	IA4	IA5	IA6	IA7	IA8	IA9	IA10	IA11	IA12	IA13	IA14	IA15	IA16	IA18	IA20	IA21	IA22	IA24	IA26
Anti-image Covariance	IA1	.190	-.083	-.078	-.030	.040	-.077	-.021	-.014	.024	-.080	.025	.002	.041	-.023	-.056	.057	-.019	.024	-.019	.007	-.006	.032
	IA2	-.083	.197	.025	-.024	-.124	.056	.007	-.003	.007	.008	.003	.046	.021	-.037	-.002	-.048	-.041	.057	.008	-.047	.036	-.074
	IA3	-.078	.025	.189	-.066	-.066	-.022	-.052	.014	-.036	.079	-.069	.065	.018	-.010	-.021	-.130	.088	.027	-.095	.027	.056	-.020
	IA4	-.030	-.024	-.066	.312	.005	-.028	.000	-.020	-.060	.035	.004	-.007	-.074	-.022	.036	.018	-.023	-.044	.010	.024	.074	-.016
	IA5	.040	-.124	-.066	.005	.197	-.054	.038	.011	-.033	-.014	.038	-.059	-.010	.081	.002	.091	-.062	-.029	.007	.053	-.040	.036
	IA6	-.077	.056	-.022	-.028	-.054	.444	-.064	.034	.013	.028	-.079	-.013	.029	-.115	.057	.007	.006	.010	.055	.033	-.010	.068
	IA7	-.021	.007	-.052	.000	.038	-.064	.355	-.086	-.050	-.006	.064	.010	-.067	.097	-.011	.085	.002	.007	.073	-.098	-.041	-.082
	IA8	-.014	-.003	.014	-.020	.011	.034	-.086	.268	-.070	-.029	-.110	.018	.003	-.008	-.015	-.008	-.017	.000	-.026	-.012	.062	-.074
	IA9	.024	.007	-.036	-.060	-.033	.013	-.050	-.070	.214	-.103	-.009	-.063	.017	-.011	.006	.023	-.027	.007	.014	-.038	-.072	.085
	IA10	-.080	.008	.079	.035	-.014	.028	-.006	-.029	-.103	.237	-.092	.056	-.018	.003	.015	-.062	.107	-.119	.017	.081	-.014	.018
	IA11	.025	.003	-.069	.004	.038	-.079	.064	-.110	-.009	-.092	.334	-.038	-.041	.062	.044	.069	-.091	.040	.041	-.011	-.036	-.031
	IA12	.002	.046	.065	-.007	-.059	-.013	.010	.018	-.063	.056	-.038	.280	.011	-.061	-.131	-.073	.092	.042	-.080	.000	.106	-.081
	IA13	.041	.021	.018	-.074	-.010	.029	-.067	.003	.017	-.018	-.041	.011	.240	-.090	-.099	-.103	.001	.013	-.101	.009	-.016	.040
	IA14	-.023	-.037	-.010	-.022	.081	-.115	.097	-.008	-.011	.003	.062	-.061	-.090	.333	-.027	-.006	-.065	-.034	-.017	.039	-.056	-.033
	IA15	-.056	-.002	-.021	.036	.002	.057	-.011	-.015	.006	.015	.044	-.131	-.099	-.027	.200	.045	-.007	-.020	.124	-.006	-.078	.009
	IA16	.057	-.048	-.130	.018	.091	.007	.085	-.008	.023	-.062	.069	-.073	-.103	-.006	.045	.399	-.115	-.063	.181	-.052	-.106	.047
	IA18	-.019	-.041	.088	-.023	-.062	.006	.002	-.017	-.027	.107	-.091	.092	.001	-.065	-.007	-.115	.387	-.095	-.007	.108	.040	.113
	IA20	.024	.057	.027	-.044	-.029	.010	.007	.000	.007	-.119	.040	.042	.013	-.034	-.020	-.063	-.095	.545	-.133	-.139	.100	-.158
	IA21	-.019	.008	-.095	.010	.007	.055	.073	-.026	.014	.017	.041	-.080	-.101	-.017	.124	.181	-.007	-.133	.459	-.125	-.113	-.010
	IA22	.007	-.047	.027	.024	.053	.033	-.098	-.012	-.038	.081	-.011	.000	.009	.039	-.006	-.052	.108	-.139	-.125	.385	-.068	.149
	IA24	-.006	.036	.056	.074	-.040	-.010	-.041	.062	-.072	-.014	-.036	.106	-.016	-.056	-.078	-.106	.040	.100	-.113	-.068	.481	-.116
	IA26	.032	-.074	-.020	-.016	.036	.068	-.082	-.074	.085	.018	-.031	-.081	.040	-.033	.009	.047	.113	-.158	-.010	.149	-.116	.671
Anti-image Correlation	IA1	.790[a]	-.429	-.412	-.125	.208	-.266	-.083	-.064	.117	-.378	.099	.007	.192	-.091	-.285	.207	-.070	.075	-.066	.024	-.020	.089
	IA2	-.429	.763[a]	.130	-.096	-.630	.188	.026	-.012	.034	.038	.013	.195	.098	-.142	-.008	-.171	-.148	.175	.026	-.171	.116	-.204
	IA3	-.412	.130	.699[a]	-.272	-.340	-.078	-.199	.063	-.181	.373	-.273	.282	.087	-.039	-.105	-.475	.326	.083	-.322	.098	.185	-.057
	IA4	-.125	-.096	-.272	.890[a]	.022	-.075	-.001	-.070	-.231	.128	.013	-.025	-.270	-.069	.145	.050	-.065	-.106	.026	.069	.192	-.035
	IA5	.208	-.630	-.340	.022	.727[a]	-.184	.144	.049	-.162	-.064	.150	-.251	-.047	.317	.012	.325	-.225	-.089	.022	.194	-.131	.099
	IA6	-.266	.188	-.078	-.075	-.184	.833[a]	-.161	.100	.042	.085	-.204	-.037	.089	-.299	.189	.017	.014	.020	.121	.079	-.022	.125
	IA7	-.083	.026	-.199	-.001	.144	-.161	.760[a]	-.279	-.181	-.021	.187	.032	-.229	.283	-.041	.226	.005	.016	.181	-.265	-.098	-.169
	IA8	-.064	-.012	.063	-.070	.049	.100	-.279	.863[a]	-.292	-.114	-.368	.067	.012	-.027	-.067	-.024	-.054	.000	-.075	-.037	.172	-.175
	IA9	.117	.034	-.181	-.231	-.162	.042	-.181	-.292	.808[a]	-.459	-.035	-.258	.077	-.040	.031	.078	-.094	.020	.045	-.132	-.223	.225
	IA10	-.378	.038	.373	.128	-.064	.085	-.021	-.114	-.459	.642[a]	-.327	.217	-.074	.012	.067	-.202	.353	-.331	.052	.267	-.041	.046
	IA11	.099	.013	-.273	.013	.150	-.204	.187	-.368	-.035	-.327	.774[a]	-.125	-.146	.186	.169	.188	-.252	.094	.104	-.029	-.090	-.065
	IA12	.007	.195	.282	-.025	-.251	-.037	.032	.067	-.258	.217	-.125	.641[a]	.043	-.200	-.552	-.219	.280	.107	-.224	.000	.288	-.187

IA13	.192	.098	.087	-.270	-.047	.089	-.229	.012	.077	-.074	-.146	.043	.746[a]	-.319	-.450	-.332	.003	.037	-.303	.029	-.046	.100
IA14	-.091	-.142	-.039	-.069	.317	-.299	.283	-.027	-.040	.012	.186	-.200	-.319	.715[a]	-.106	-.017	-.181	-.079	-.044	.109	-.139	-.069
IA15	-.285	-.008	-.105	.145	.012	.189	-.041	-.067	.031	.067	.169	-.552	-.450	-.106	.668[a]	.158	-.024	-.060	.410	-.023	-.253	.024
IA16	.207	-.171	-.475	.050	.325	.017	.226	-.024	.078	-.202	.188	-.219	-.332	-.017	.158	.532[a]	-.293	-.135	.423	-.133	-.241	.090
IA18	-.070	-.148	.326	-.065	-.225	.014	.005	-.054	-.094	.353	-.252	.280	.003	-.181	-.024	-.293	.647[a]	-.207	-.017	.280	.094	.221
IA20	.075	.175	.083	-.106	-.089	.020	.016	.000	.020	-.331	.094	.107	.037	-.079	-.060	-.135	-.207	.585[a]	-.266	-.303	.195	-.262
IA21	-.066	.026	-.322	.026	.022	.121	.181	-.075	.045	.052	.104	-.224	-.303	-.044	.410	.423	-.017	-.266	.506[a]	-.297	-.240	-.018
IA22	.024	-.171	.098	.069	.194	.079	-.265	-.037	-.132	.267	-.029	.000	.029	.109	-.023	-.133	.280	-.303	-.297	.711[a]	-.158	.294
IA24	-.020	.116	.185	.192	-.131	-.022	-.098	.172	-.223	-.041	-.090	.288	-.046	-.139	-.253	-.241	.094	.195	-.240	-.158	.707[a]	-.204
IA26	.089	-.204	-.057	-.035	.099	.125	-.169	-.175	.225	.046	-.065	-.187	.100	-.069	.024	.090	.221	-.262	-.018	.294	-.204	.513[a]

a. Measures of Sampling Adequacy(MSA)

Total Variance Explained

Component	Initial Eigenvalues			Loadings			Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.744	12.474	56.921	2.744	12.474	56.921	3.579	16.268	53.659
2	1.459	6.632	63.552	1.459	6.632	63.552	1.844	8.382	62.040
3	1.254	5.702	69.254	1.254	5.702	69.254	1.479	6.724	68.764
4	1.051	4.777	74.031	1.051	4.777	74.031	1.159	5.267	74.031
5	.869	4.522	75.876						
6	.801	4.021	75.112						
7	.783	3.560	77.591						
8	.714	3.248	80.839						
9	.679	3.088	83.927						
10	.563	2.559	86.486						
11	.492	2.236	88.722						
12	.430	1.954	90.675						
13	.372	1.691	92.366						
14	.304	1.381	93.747						
15	.279	1.267	95.014						
16	.250	1.136	96.150						
17	.208	.944	97.094						
18	.190	.865	97.959						
19	.160	.728	98.687						
20	.113	.513	99.200						
21	.102	.463	99.664						
22	.074	.336	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component			
	1	2	3	4
IA2	.864			
IA5	.849			
IA3	.795			
IA1	.789			
IA4	.714			
IA6	.699			
IA8		.879		
IA9		.840		
IA10		.829		
IA11		.738		
IA7		.735		
IA15			.873	
IA13			.852	
IA14			.805	
IA12			.784	
IA16			.640	
IA22				.783
IA21				.729
IA20				.700
IA18				.747
IA26				.721
IA24				.573

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Appendix E : Factor Analysis of Industry Strategy

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.779
Bartlett's Test of Sphericity	Approx. Chi-Square	421.243
	df	66
	Sig.	.000

Communalities

	Initial	Extraction
IS1	1.000	.778
IS2	1.000	.868
IS3	1.000	.699
IS5	1.000	.825
IS6	1.000	.841
IS8	1.000	.710
IS9	1.000	.539
IS10	1.000	.507
IS12	1.000	.817
IS13	1.000	.690
IS14	1.000	.772
IS15	1.000	.806

Extraction Method: Principal Component Analysis.

Anti-image Matrices

		IS1	IS2	IS3	IS5	IS6	IS8	IS9	IS10	IS12	IS13	IS14	IS15
Anti-image Covariance	IS1	.540	-.110	-.074	-.024	-.175	-.026	-.059	.055	.087	.004	-.057	-.037
	IS2	-.110	.209	-.079	-.136	-.018	.030	.009	-.031	-.038	-.031	.097	-.023
	IS3	-.074	-.079	.355	-.033	.001	.008	.086	-.061	-.083	.037	-.104	.061
	IS5	-.024	-.136	-.033	.254	.119	-.027	-.090	-.009	.012	.019	-.050	-.005
	IS6	-.175	-.018	.001	.119	.678	-.182	.107	.073	.006	.020	.021	.006
	IS8	-.026	.030	.008	-.027	-.182	.671	-.133	-.057	-.142	.039	.024	.042
	IS9	-.059	.009	.086	-.090	.107	-.133	.644	.028	-.015	-.117	-.004	.002
	IS10	.055	-.031	-.061	-.009	.073	-.057	.028	.614	-.070	.025	.022	-.142
	IS12	.087	-.038	-.083	.012	.006	-.142	-.015	-.070	.260	-.186	-.043	-.005
	IS13	.004	-.031	.037	.019	.020	.039	-.117	.025	-.186	.404	-.044	.064
	IS14	-.057	.097	-.104	-.050	.021	.024	-.004	.022	-.043	-.044	.451	-.286
	IS15	-.037	-.023	.061	-.005	.006	.042	.002	-.142	-.005	.064	-.286	.513
Anti-image Correlation	IS1	.741[a]	-.328	-.168	-.063	-.290	-.043	-.100	.095	.233	.009	-.115	-.070
	IS2	-.328	.780[a]	-.291	-.589	-.049	.081	.025	-.087	-.164	-.107	.315	-.070
	IS3	-.168	-.291	.865[a]	-.108	.003	.016	.180	-.130	-.272	.097	-.259	.142
	IS5	-.063	-.589	-.108	.823[a]	.287	-.065	-.222	-.023	.047	.061	-.147	-.015
	IS6	-.290	-.049	.003	.287	.648[a]	-.270	.162	.113	.015	.038	.038	.010
	IS8	-.043	.081	.016	-.065	-.270	.725[a]	-.202	-.088	-.340	.075	.044	.071
	IS9	-.100	.025	.180	-.222	.162	-.202	.822[a]	.045	-.036	-.229	-.008	.003
	IS10	.095	-.087	-.130	-.023	.113	-.088	.045	.897[a]	-.174	.049	.042	-.254
	IS12	.233	-.164	-.272	.047	.015	-.340	-.036	-.174	.781[a]	-.574	-.126	-.014
	IS13	.009	-.107	.097	.061	.038	.075	-.229	.049	-.574	.779[a]	-.103	.140
	IS14	-.115	.315	-.259	-.147	.038	.044	-.008	.042	-.126	-.103	.658[a]	-.594
	IS15	-.070	-.070	.142	-.015	.010	.071	.003	-.254	-.014	.140	-.594	.641[a]

a. Measures of Sampling Adequacy(MSA)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.351	11.256	63.421	1.351	11.256	63.421	1.974	16.451	61.666
2	1.122	9.347	72.768	1.122	9.347	72.768	1.332	11.102	72.768
3	1.062	8.279	72.890						
4	.881	7.717	78.068						
5	.836	6.967	79.734						
6	.662	5.519	85.253						
7	.496	4.136	89.389						
8	.356	2.964	92.353						
9	.354	2.950	95.303						
10	.255	2.122	97.425						
11	.178	1.480	98.905						
12	.131	1.095	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component	
	1	2
IS5	.885	
IS2	.871	
IS3	.843	
IS1	.961	
IS12		.822
IS13		.808
IS8		.696
IS9		.655
IS15		.869
IS14		.832
IS10		.564
IS6		.819

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 2 iterations.

Appendix F : Factor Analysis of Regulation

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.769
Bartlett's Test of Sphericity	Approx. Chi-Square	657.462
	df	105
	Sig.	.000

Communalities

	Initial	Extraction
RG1	1.000	.698
RG2	1.000	.651
RG3	1.000	.720
RG4	1.000	.594
RG5	1.000	.718
RG6	1.000	.823
RG7	1.000	.558
RG8	1.000	.599
RG9	1.000	.744
RG10	1.000	.694
RG14	1.000	.663
RG15	1.000	.697
RG16	1.000	.538
RG17	1.000	.517
RG18	1.000	.712

Extraction Method: Principal Component Analysis.

Anti-image Matrices

		RG1	RG2	RG3	RG4	RG5	RG6	RG7	RG8	RG9	RG10	RG14	RG15	RG16	RG17	RG18
Anti-image Covariance	RG1	.263	-.037	.006	-.103	.030	-.114	.033	-.025	-.072	.006	-.052	.066	-.059	.071	.048
	RG2	-.037	.443	.114	-.028	-.068	-.049	-.102	.081	.017	-.001	.049	.030	-.030	.056	.044
	RG3	.006	.114	.332	-.161	-.072	-.029	-.122	-.009	.088	.028	.108	.014	.000	-.091	-.031
	RG4	-.103	-.028	-.161	.451	.060	.094	-.029	-.013	-.038	-.081	.067	-.011	-.008	-.086	-.030
	RG5	.030	-.068	-.072	.060	.281	-.031	.055	-.126	-.073	-.098	-.016	.038	-.094	-.079	-.104
	RG6	-.114	-.049	-.029	.094	-.031	.171	-.081	.024	-.043	-.015	-.006	-.074	.030	.005	-.004
	RG7	.033	-.102	-.122	-.029	.055	-.081	.580	.105	-.002	-.083	-.060	.005	.035	.010	.047
	RG8	-.025	.081	-.009	-.013	-.126	.024	.105	.391	.110	-.068	-.043	-.126	.220	.099	.085
	RG9	-.072	.017	.088	-.038	-.073	-.043	-.002	.110	.230	-.030	.002	-.005	.126	-.021	-.030
	RG10	.006	-.001	.028	-.081	-.098	-.015	-.083	-.068	-.030	.416	-.052	.004	-.129	.000	-.016
	RG14	-.052	.049	.108	.067	-.016	-.006	-.060	-.043	.002	-.052	.333	-.066	.002	-.136	-.086
	RG15	.066	.030	.014	-.011	.038	-.074	.005	-.126	-.005	.004	-.066	.364	-.158	-.002	-.098
	RG16	-.059	-.030	.000	-.008	-.094	.030	.035	.220	.126	-.129	.002	-.158	.461	-.012	.017
	RG17	.071	.056	-.091	-.086	-.079	.005	.010	.099	-.021	.000	-.136	-.002	-.012	.493	.189
	RG18	.048	.044	-.031	-.030	-.104	-.004	.047	.085	-.030	-.016	-.086	-.098	.017	.189	.268
Anti-image Correlation	RG1	.781[a]	-.109	.021	-.298	.112	-.536	.085	-.078	-.292	.019	-.177	.212	-.171	.197	.180
	RG2	-.109	.859[a]	.298	-.063	-.193	-.180	-.201	.194	.052	-.002	.128	.074	-.066	.120	.128
	RG3	.021	.298	.751[a]	-.417	-.237	-.120	-.277	-.025	.318	.075	.325	.039	.000	-.226	-.102
	RG4	-.298	-.063	-.417	.735[a]	.170	.338	-.057	-.032	-.117	-.188	.173	-.028	-.017	-.182	-.087
	RG5	.112	-.193	-.237	.170	.767[a]	-.141	.136	-.380	-.288	-.286	-.053	.120	-.262	-.211	-.379
	RG6	-.536	-.180	-.120	.338	-.141	.838[a]	-.258	.093	-.218	-.057	-.025	-.295	.107	.017	-.017
	RG7	.085	-.201	-.277	-.057	.136	-.258	.701[a]	.220	-.007	-.169	-.137	.011	.068	.018	.120
	RG8	-.078	.194	-.025	-.032	-.380	.093	.220	.587[a]	.367	-.168	-.118	-.334	.519	.226	.262
	RG9	-.292	.052	.318	-.117	-.288	-.218	-.007	.367	.826[a]	-.097	.008	-.017	.386	-.062	-.122
	RG10	.019	-.002	.075	-.188	-.286	-.057	-.169	-.168	-.097	.880[a]	-.139	.010	-.296	.001	-.046
	RG14	-.177	.128	.325	.173	-.053	-.025	-.137	-.118	.008	-.139	.854[a]	-.189	.005	-.335	-.289
	RG15	.212	.074	.039	-.028	.120	-.295	.011	-.334	-.017	.010	-.189	.785[a]	-.386	-.004	-.314
	RG16	-.171	-.066	.000	-.017	-.262	.107	.068	.519	.386	-.296	.005	-.386	.533[a]	-.024	.048
	RG17	.197	.120	-.226	-.182	-.211	.017	.018	.226	-.062	.001	-.335	-.004	-.024	.638[a]	.521
	RG18	.180	.128	-.102	-.087	-.379	-.017	.120	.262	-.122	-.046	-.289	-.314	.048	.521	.771[a]

a. Measures of Sampling Adequacy(MSA)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.789	38.594	38.594	5.789	38.594	38.594	3.749	24.993	24.993
2	2.132	53.290	53.290	2.132	53.290	53.290	1.602	40.048	40.048
3	2.428	16.184	54.777	2.428	16.184	54.777	3.213	21.421	46.414
4	1.684	11.228	66.005	1.684	11.228	66.005	2.939	19.591	66.005
5	.788	5.251	77.343						
6	.656	4.377	81.720						
7	.565	3.764	85.484						
8	.498	3.321	88.805						
9	.420	2.799	91.604						
10	.368	2.451	94.055						
11	.284	1.891	95.946						
12	.218	1.454	97.400						
13	.148	.985	98.385						
14	.129	.861	99.246						
15	.113	.754	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component			
	1	2	3	4
RG4	.932			
RG3	.762			
RG5	.818			
RG1	.880			
RG2	.847			
RG9		.923		
RG6		.913		
RG7		.823		
RG8		.822		
RG14			.797	
RG10			.679	
RG17				.899
RG18				.735
RG16				.890
RG15				.711

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Appendix G : Factor Analysis of Attitude

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.754
Bartlett's Test of Sphericity	Approx. Chi-Square	648.574
	df	105
	Sig.	.000

Communalities

	Initial	Extraction
AT1	1.000	.800
AT2	1.000	.801
AT3	1.000	.529
AT4	1.000	.716
AT5	1.000	.687
AT7	1.000	.684
AT8	1.000	.725
AT10	1.000	.590
AT11	1.000	.793
AT12	1.000	.558
AT13	1.000	.560
AT14	1.000	.745
AT15	1.000	.754
AT16	1.000	.870
AT17	1.000	.844

Extraction Method: Principal Component Analysis.

Anti-image Matrices

		AT1	AT2	AT3	AT4	AT5	AT7	AT8	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17
Anti-image Covariance	AT1	.301	-.091	-.195	-.101	-.002	-.036	.041	-.053	.079	.048	-.022	.054	.010	-.050	.001
	AT2	-.091	.249	-.013	-.085	-.081	.018	-.030	-.036	.015	.115	-.060	-.017	.074	.023	-.046
	AT3	-.195	-.013	.493	.036	.005	.023	-.020	.072	-.043	-.051	-.003	-.075	-.076	.002	.054
	AT4	-.101	-.085	.036	.358	-.057	.024	-.004	-.017	-.137	-.073	.077	-.072	-.007	.046	-.023
	AT5	-.002	-.081	.005	-.057	.361	-.064	-.009	.080	.023	.056	-.086	-.043	.052	-.027	.005
	AT7	-.036	.018	.023	.024	-.064	.292	-.206	-.023	.006	-.026	.017	-.017	-.051	.063	-.047
	AT8	.041	-.030	-.020	-.004	-.009	-.206	.282	-.038	.014	-.061	.056	-.040	.013	-.043	.024
	AT10	-.053	-.036	.072	-.017	.080	-.023	-.038	.656	-.197	-.025	-.055	-.031	-.015	-.039	.030
	AT11	.079	.015	-.043	-.137	.023	.006	.014	-.197	.680	.052	.058	-.073	.013	-.007	-.051
	AT12	.048	.115	-.051	-.073	.056	-.026	-.061	-.025	.052	.512	-.141	-.059	.147	-.063	-.017
	AT13	-.022	-.060	-.003	.077	-.086	.017	.056	-.055	.058	-.141	.340	-.146	-.060	.056	-.039
	AT14	.054	-.017	-.075	-.072	-.043	-.017	-.040	-.031	-.073	-.059	-.146	.275	-.010	-.025	.052
	AT15	.010	.074	-.076	-.007	.052	-.051	.013	-.015	.013	.147	-.060	-.010	.377	-.086	-.063
	AT16	-.050	.023	.002	.046	-.027	.063	-.043	-.039	-.007	-.063	.056	-.025	-.086	.186	-.136
	AT17	.001	-.046	.054	-.023	.005	-.047	.024	.030	-.051	-.017	-.039	.052	-.063	-.136	.201
Anti-image Correlation	AT1	.750[a]	-.332	-.506	-.307	-.007	-.122	.142	-.119	.174	.121	-.069	.189	.029	-.213	.004
	AT2	-.332	.818[a]	-.037	-.286	-.271	.065	-.113	-.090	.037	.323	-.206	-.065	.241	.108	-.206
	AT3	-.506	-.037	.776[a]	.086	.012	.060	-.055	.126	-.074	-.101	-.007	-.204	-.177	.008	.172
	AT4	-.307	-.286	.086	.828[a]	-.158	.075	-.014	-.035	-.278	-.171	.221	-.229	-.019	.178	-.085
	AT5	-.007	-.271	.012	-.158	.889[a]	-.197	-.028	.164	.047	.131	-.245	-.138	.141	-.106	.019
	AT7	-.122	.065	.060	.075	-.197	.694[a]	-.719	-.052	.014	-.068	.053	-.060	-.153	.271	-.194
	AT8	.142	-.113	-.055	-.014	-.028	-.719	.708[a]	-.089	.031	-.159	.180	-.142	.041	-.186	.099
	AT10	-.119	-.090	.126	-.035	.164	-.052	-.089	.845[a]	-.295	-.043	-.117	-.072	-.030	-.112	.082
	AT11	.174	.037	-.074	-.278	.047	.014	.031	-.295	.691[a]	.088	.121	-.168	.026	-.019	-.138
	AT12	.121	.323	-.101	-.171	.131	-.068	-.159	-.043	.088	.603[a]	-.339	-.157	.335	-.204	-.052
	AT13	-.069	-.206	-.007	.221	-.245	.053	.180	-.117	.121	-.339	.743[a]	-.478	-.169	.224	-.150
	AT14	.189	-.065	-.204	-.229	-.138	-.060	-.142	-.072	-.168	-.157	-.478	.830[a]	-.030	-.109	.219
	AT15	.029	.241	-.177	-.019	.141	-.153	.041	-.030	.026	.335	-.169	-.030	.715[a]	-.325	-.228
	AT16	-.213	.108	.008	.178	-.106	.271	-.186	-.112	-.019	-.204	.224	-.109	-.325	.613[a]	-.702
	AT17	.004	-.206	.172	-.085	.019	-.194	.099	.082	-.138	-.052	-.150	.219	-.228	-.702	.657[a]

a. Measures of Sampling Adequacy(MSA)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.047	33.650	33.650	5.047	33.650	33.650	3.832	25.549	25.549
2	2.712	18.083	51.733	2.712	18.083	51.733	2.633	17.556	43.105
3	1.773	11.823	63.556	1.773	11.823	63.556	2.618	17.456	60.560
4	1.124	7.493	71.049	1.124	7.493	71.049	1.573	10.489	71.049
5	.987	6.579	77.628						
6	.711	4.737	82.365						
7	.609	4.062	86.427						
8	.559	3.728	90.155						
9	.338	2.250	92.405						
10	.278	1.852	94.257						
11	.247	1.647	95.904						
12	.193	1.285	97.190						
13	.171	1.141	98.331						
14	.155	1.032	99.363						
15	.096	.637	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component			
	1	2	3	4
AT2	.872			
AT1	.845			
AT5	.742			
AT3	.717			
AT4	.716			
AT8		.814		
AT7		.781		
AT11		.880		
AT10		.668		
AT12			.742	
AT13			.599	
AT14			.593	
AT16				.921
AT17				.898
AT15				.865

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Appendix H : Reliability Analysis for Variables after Factor Analysis

1. Industry Acceptance

Reliability Statistics

Cronbach's Alpha	N of Items
.761	22

Item Statistics

	Mean	Std. Deviation	N
IA1	3.64	.880	75
IA2	3.87	.949	75
IA3	3.64	.832	75
IA4	3.67	.963	75
IA5	3.77	.967	75
IA6	3.60	.838	75
IA7	2.77	1.008	75
IA8	3.35	1.020	75
IA9	3.19	1.159	75
IA10	3.51	1.045	75
IA11	3.44	1.093	75
IA12	3.49	.812	75
IA13	3.43	.791	75
IA14	3.67	.811	75
IA15	3.43	1.055	75
IA16	3.33	1.057	75
IA18	3.29	.851	75
IA20	3.65	.937	75
IA21	2.72	.863	75
IA22	2.52	.875	75
IA24	2.96	.951	75
IA26	3.48	1.018	75

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IA1	70.77	63.745	.573	.810	.736
IA2	70.55	67.900	.241	.803	.757
IA3	70.77	64.448	.556	.811	.738
IA4	70.75	62.489	.601	.688	.732
IA5	70.64	68.504	.196	.803	.760
IA6	70.81	67.911	.286	.556	.754
IA7	71.64	63.261	.517	.645	.737
IA8	71.07	61.171	.649	.732	.727
IA9	71.23	58.502	.718	.786	.718
IA10	70.91	63.761	.463	.763	.741
IA11	70.97	63.459	.454	.666	.741
IA12	70.92	70.075	.135	.720	.763
IA13	70.99	67.203	.365	.760	.750
IA14	70.75	68.408	.261	.667	.755
IA15	70.99	67.067	.254	.800	.757
IA16	71.08	69.885	.089	.601	.769
IA18	71.12	71.810	.003	.613	.770
IA20	70.76	69.401	.147	.455	.763
IA21	71.69	70.134	.117	.541	.764
IA22	71.89	72.070	-.018	.615	.772
IA24	71.45	69.603	.130	.519	.764
IA26	70.93	70.441	.064	.329	.770

2. Industry Strategy

Reliability Statistics

Cronbach's Alpha	N of Items
.809	12

Item Statistics

	Mean	Std. Deviation	N
IS1	3.29	.997	75
IS2	3.85	.849	75
IS3	3.73	.963	75
IS5	3.93	.920	75
IS6	2.49	.795	75
IS8	3.33	.827	75
IS9	3.72	.627	75
IS10	3.28	.763	75
IS12	3.77	.815	75
IS13	3.80	.753	75
IS14	3.37	.897	75
IS15	3.08	.882	75

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IS1	38.37	27.724	.435	.460	.798
IS2	37.81	26.262	.723	.791	.770
IS3	37.93	25.495	.705	.645	.769
IS5	37.73	25.955	.691	.746	.772
IS6	39.17	34.983	-.248	.322	.850
IS8	38.33	29.360	.361	.329	.804
IS9	37.95	30.159	.396	.356	.801
IS10	38.39	28.538	.510	.386	.791
IS12	37.89	26.853	.682	.740	.775
IS13	37.87	28.631	.506	.596	.792
IS14	38.29	28.210	.448	.549	.796
IS15	38.59	29.219	.344	.487	.806

3. Regulation

Reliability Statistics

Cronbach's Alpha	N of Items
.696	15

Item Statistics

	Mean	Std. Deviation	N
RG1	3.32	1.067	75
RG2	2.77	.894	75
RG3	3.21	.934	75
RG4	2.99	.951	75
RG5	3.60	.959	75
RG6	3.23	1.158	75
RG7	2.79	.810	75
RG8	3.47	.811	75
RG9	3.25	1.116	75
RG10	3.65	.966	75
RG14	3.43	1.232	75
RG15	3.27	1.107	75
RG16	3.04	.979	75
RG17	3.21	.990	75
RG18	3.56	1.003	75

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RG1	45.47	35.793	.495	.737	.655
RG2	46.01	38.608	.346	.557	.676
RG3	45.57	47.194	-.375	.668	.751
RG4	45.80	46.216	-.299	.549	.745
RG5	45.19	34.505	.695	.719	.633
RG6	45.56	32.844	.683	.829	.624
RG7	46.00	39.865	.267	.420	.685
RG8	45.32	45.275	-.246	.609	.732
RG9	45.53	34.793	.548	.770	.646
RG10	45.13	34.333	.706	.584	.631
RG14	45.36	33.288	.594	.667	.636
RG15	45.52	35.415	.502	.636	.653
RG16	45.75	37.678	.384	.539	.671
RG17	45.57	45.815	-.264	.507	.744
RG18	45.23	35.799	.537	.732	.651

4. Attitude

Reliability Statistics

Cronbach's Alpha	N of Items
.838	15

Item Statistics

	Mean	Std. Deviation	N
AT1	3.60	.986	75
AT2	3.40	.900	75
AT3	3.71	.693	75
AT4	3.51	.921	75
AT5	3.48	.921	75
AT7	3.32	.720	75
AT8	3.19	.730	75
AT10	3.12	.677	75
AT11	2.95	.914	75
AT12	3.91	.791	75
AT13	3.53	.777	75
AT14	3.65	.979	75
AT15	3.05	.943	75
AT16	3.08	.866	75
AT17	3.03	.854	75

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
AT1	46.92	41.723	.561	.699	.822
AT2	47.12	42.107	.593	.751	.820
AT3	46.81	44.965	.474	.507	.828
AT4	47.01	41.878	.598	.642	.819
AT5	47.04	41.904	.595	.639	.820
AT7	47.20	44.297	.525	.708	.825
AT8	47.33	44.279	.519	.718	.826
AT10	47.40	44.946	.489	.344	.828
AT11	47.57	45.005	.327	.320	.837
AT12	46.61	46.186	.282	.488	.838
AT13	46.99	43.716	.538	.660	.824
AT14	46.87	41.036	.626	.725	.817
AT15	47.47	46.901	.159	.623	.848
AT16	47.44	45.277	.328	.814	.836
AT17	47.49	44.659	.391	.799	.833

Appendix I : Pearson Correlation Analysis

Correlations

		Industry Acceptance	Industry Strategy	Regulation	Attitude
Industry Acceptance	Pearson Correlation	1	.277**	.249*	.554**
	Sig. (1-tailed)		.008	.015	.000
	N	75	75	75	75
Industry Strategy	Pearson Correlation	.277**	1	-.160	.496**
	Sig. (1-tailed)	.008		.085	.000
	N	75	75	75	75
Regulation	Pearson Correlation	.249*	-.160	1	.322**
	Sig. (1-tailed)	.015	.085		.002
	N	75	75	75	75
Attitude	Pearson Correlation	.554**	.496**	.322**	1
	Sig. (1-tailed)	.000	.000	.002	
	N	75	75	75	75

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).