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Master's Thesis  
Academic Year 2017

Design for Increasing Consumer Trust of Food  
Safety in Taiwan, Academic Participatory  
Guarantee System

Keio University Graduate School of Media Design

LIN KAI YUAN

A Master's Thesis  
submitted to Keio University Graduate School of Media Design,  
in partial fulfillment of the requirements for the degree of  
MASTER of Media Design

LIN KAI YUAN

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Abstract of Master's Thesis of Academic Year 2017

Design for Increasing Consumer Trust of Food Safety in  
Taiwan, Academic Participatory Guarantee System

Category: Design

Summary

Originally, Food Safety certification and legislation are launched by the government for companies to manage and check their quality. However, the transformation of the social structure and consumer awareness toward Food Safety led to the different scenario. Consumer trust toward the product and company highly influence the market, meanwhile, their concerns do supervise the company to keep the proper production. Consumers are the main target of Food Safety Management System but currently, they are far from it. It is mostly the internal operation between stakeholders, therefore, after the Food Safety incidents happened, government and companies lost the credibility very soon. The research came to the hypothesis that neutral and reliable institute which is close to the consumer is needed as the first step to change the Food Safety Management System within Taiwan. The proposed system design Academic Participatory Guarantee System consists of three concepts: University Qualification, Consumer Friendliness and Government Supervision". It is a university-based Food Safety Management System which designed for increasing consumer trust toward the Food Safety in Taiwan. It has also modified the insufficiency of PGS that has too many participation and no supervisor. Further, the feasibility of this system had been evaluated by the stakeholders and university. This research built the structure of APGS, the detail and quality standard are conducted to the future research.

Keywords:

Food Safety, PGS, Certification, University, Consumer Trust

Keio University Graduate School of Media Design

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# Chapter 1

## Introduction

### 1.1. Research Motivation

Food Safety is a serious and sensitive issue in Taiwan especially in the recent years. Food Safety incidents happened even for products which have a certificate. Therefore, management systems have to be improved. Since the 80s, illegal additives and poisonous food components has been recorded, but it was not an issue at that time. Food Safety issues became a severe problem starting from the 'Plasticizer incident' which occurred at 2010. Consumers realized things they bought and ate for over decades were a fraud. Ever since, Food Safety consciousness increased and more and more illegal incidents were exposed. Consumer trust for Food Safety reached the worst case scenario. Several companies and suppliers caused severe problems such as using illegal additives, in order to reduce the cost of ingredients. People were disappointed by the change. Then, some companies passed the certification and got the permission from the government. Active consumers checked the food they consume daily, and they found out more products were illegal, even poisonous and contaminated. In general, Food Safety became better, the author found out it had a high-positive correlation with consumers. Consumers play an important role in Food Safety, therefore, their consumer trust will improve the Food Safety Management System.

Another problem is that the current certification is too complicated. For instance, the company applies certification for one production line only, which means only the products from this line are safe, but the companies can still claim that

the certification means they have 'Good Manufacturing Practice'. In this case, consumers will have misunderstanding because other products from the company, although they pass the certification, they are still unsafe. Furthermore, certifications currently are not mandatory, and they are expensive. There is no reason for small companies which have less knowledge and funds to go through the troublesome process.

The current system does not accommodate all companies, however, Food Safety is supposed to be widely controlled. This situation motivated the author to create a simple and accessible system for the industry.

## 1.2. Research Background

Before and even after the large number of Food Safety incidents, the author noticed that the attitude and actions of consumers, companies as well as government have changed as described in the following table.

	<b>Consumer</b>	<b>Food company/supplier</b>	<b>Government</b>
<b>Food Safety 1.0</b>	1.Trust company and government 2.Passive attitude	1.Package design 2.Price rivalry	1.Factory hygiene regulation 2.Food Safety certification
Food Safety incidents + Consumer awareness raised			
<b>Food Safety 2.0</b>	1.Participate the production 2.Agree the supplier 3.Active attitude	1.Healthy and organic promotion 2.Get international certification	1.Modify regulation 2. Encourage organic 3. New certification
<b>Current situation</b>	1.Stay in minority 2.Can't reach factory	1.Commercialize organic 2.Confuse consumers	1.Too complicated 2.Duty confusing

Table 1.1: Strategy toward Food Safety are changing.

Food Safety from a consumer perspective is divided into two phases of change. For Food Safety 1.0, consumers remained passive in their belief in the quality of both company and the government. As for Food Safety 2.0, the major point was that the consumers were active and spontaneous. They got involved in the production process from different angles, and they searched and understood more about Food Safety information. Concepts such as alternative farming, food education, small-holder farming and last but not least: PGS(Participatory Guarantee System), were introduced to the market. Through the learning process, consumers chose a brand or suppliers, then agreed with the way they produced the food.

Take PGS for instance, in primary production, such as vegetable or fruits, this platform builds the mutual agreement with consumers and sellers. As the result, Consumers would attend or understand the cultivation, and would benefit from the training or educational lectures provided.

The factory tour's purpose is mainly for entertainment and promotion. People can not reach the real production line for hygienic reasons. The main problem in Food Safety 2.0 was that only a small group of people could take part in the production process. Most of consumers and restaurants do not have time to completely understand and participate in the production process. Nowadays, people can check the information shared on social media such as LINE or Facebook, however only a small number of people have the right knowledge in food science and agriculture. Staying active and positive to search for more information and participate in the production are recommended.

The strategy of food company and supplier in Food Safety 1.0 focused on package design and price competition; attractive appearance and lower price made more revenue. Food Safety 2.0 follows the trend of active consumers. Although most people are not expert in food science, they still desire organic and health food. Therefore, some companies and suppliers started to promote the product as non-poisonous and high quality. In fact, no one knows if it is credible, but since they claim some products are organic or natural, their price increases. Food Safety does not mean healthy or high quality, and the safe and edible food does not mean organic. Companies mix them together to raise purchase intention but it commercializes the word organic, moreover they created their own certificate for Food Safety. It confuses the market and consumers. Companies that have the resources and capabilities are able to get an international certification, which helps them to prove the safety of their products for the market. However, international certification needs not only knowledge but also funds, which is the entry barrier for smaller companies.

For Food Safety 1.0, government only solves the current problems when they happen, and do not innovate or think ahead. They give the permission to companies for launching the factory, and promote the certification label. As the Food Safety 2.0 era unfolded, the government has pushed the healthy life propaganda, has modified the Food Safety regulation, and has assisted the organic cultivation

as well as production. However, the result was not effective, because the regulation and certification became more complicated, and more parties got involved which mixes the duties. The government is doing lots of effort to improve the situation nowadays, but the situation is still chaotic.

### **1.3. Research Purpose**

This research aims to build a management system and process for Food Safety in Taiwan. The system's function is to reduce the distance between consumers and Food Safety, encourage as well as extend their concern. In addition, manage the potential risk of small scale production which is not under control, but is much closer to the consumer. The system's purpose is to solidify consumer trust. Two issues are addressed in this research. First, because the companies and suppliers which already passed the official certification still had multiple Food Safety incidents, consumers upheld a suspicious attitude towards the system operated by the government, the food chain from material suppliers to food companies, and even certification bodies. Therefore, a credible and neutral institute is needed for the system. The system also has to be understandable and close to consumers. Secondly, small companies and suppliers have no capability and knowledge to get the certification and manage their Food Safety. However, they are the majority that highly influences consumers. Instead of building an extremely accurate certification, this research aims to provide an accessible and easy executive system to raise the overall Food Safety standards.

# Chapter 2

## Literature Review

The literature review is divided into four sections. Food Safety Management System originally was designed for the scientific purpose, not for the consumer. Besides, the studies of consumer trust within Food Safety domain continue to be related to analyzing behavior and intention. The system design requires understanding of the consumer trust, and aspects from different angles which will provide this research a deeper and consistent knowledge. The problems in current Food Safety Management System in Taiwan are discussed in the next section. To think out of the box, this research picked PGS as a reference to see how to manage the production which is not under supervision. Last but not least, university is the main subject of this research, therefore, to analyze and integrate their function and current role in Food Safety is of extreme importance.

### 2.1. Consumer Trust

Among the issues of Agriculture, Food Safety has the closest and most direct influence of human health, that is why it calls for full attention from society and media. [41] In terms of Food Safety, this research starts with the definition of consumer trust. The shortcomings of current Food Safety Management Systems and limited knowledge in Food Safety has led to barriers and lack of mutual trust between producers and consumers. [43] It affects the purchase intention directly and indirectly, which harms the promotion of Food Safety. 'Trust' is invisible, but makes the big effect to everything, therefore, this research considers consumer

trust as the important issue, and look into the literature of Definition, Consumer trust in Food Safety, Increase consumer trust and Measurement of consumer trust.

### 2.1.1 Definition

The definition of 'Trust' originated in 1950, psychologists began to work on system discussion, socialists and economists got involved and started to research from different aspects. Economist proceeded from the theory of trading cost, this was how they defined trust: "A belief between each other, they believe no one will make unfavorable behavior to others". Trust is also the positive intention, for ones to believe others' motivation and action are beneficial and harmless within the risk. [10] Moorman, Deshpande & Zaltman(1993) defined trust as "Rely on business partner that you believe", they considered trust should base on someone's implementation ability, reliability and honesty. [32] The view of trust from Rousseau, Sitkin, Burt, and Camerer(1998) was a psychological condition, a positive expectation toward others intention or behavior, included the acceptance of loss. [34] Garbarino and Johnson(1999) pointed out that trust is the consumer confidence toward organization's service, quality and reliability. [18] Doney and Cannon(1997) defined trust as how consumer feels the reliability of target object and merciful level in trading, which means they believe there is no cheating between. [14] Berry's definition of trust is within the trading, ones has the confidence to the others, and generates the intention of reliance. [12] To integrate above, this research comes out the definition of trust: "Through the understanding of the system operation, Consumer will agree the process and therefore generate the confidence and purchase intention to the product".

### 2.1.2 Consumer Trust in Food Safety

Lang and Hallman(2005) pointed out in the research of "Public confidence in Genetically Modified Food" that American consumers have less knowledge in the relative area, therefore they choose to trust systems, experts, and organizations. Thus, the institutions or people who hold the better credibility in their research are Environmental organizations, Scientists, Consumer advocacy organization, Medical professionals, and University. In the other hand, people do not



trust Industry, Grocery Stores, Media Sources and Government. [28] The distance between field and fork is far in Modern society. People have to go through the broker which indicates food company or supplier for food and rely on the trust toward broker to ensure the food quality and safety. Due to the transformation of the social structure, consumer trust toward food base on a certain object they believe and agree. Although the Food Safety deeply relates to scientific basis, when it comes to consumer, a research found out that 'Transparency to consumer' and 'Be responsible' have high-positive correlation with consumer trust. [13]

The authoritative Food Safety website in the US pointed out that Food Safety certification mostly applied to specific fields, specific plants and specific process. It typically does not apply to the company at all. Companies claim that they have many certificates, but in fact, those certificates do not exist, even they create their own certificate, and it misleads the consumer. Rather than Food Safety, the priority for the company is the marketing benefit through the certificate. There was a case that a company claimed that they had the GFSI certificate, but GFSI is not a certification, in addition, government found out that this company only apply GMP, not GFSI standard. [23] Many are at fault and sometimes these situations are accidental, caused by web designers who have been handed a bunch of logos without understanding. But in the end, every company has a responsibility not to exaggerate its Food Safety credentials.

**TQF**

**台灣食安過去、現在與未來**

**國際級食安標準保護網**

食品安全控制重點		FGMP (食品良好作業規範)	TQF (台灣優良食品認證制度)	GFSI (全球食品安全標準)
一	源頭管理 <ul style="list-style-type: none"> <li>供應商評鑑</li> <li>原料評鑑</li> </ul>	✗	✓ <b>勝</b>	✓
二	資料審核 (符合基本廠規) <ul style="list-style-type: none"> <li>HACCP (食品安全管制系統)</li> <li>QC工程圖 (食品製造及品質控管機制)</li> </ul>	△ *符合基本 HACCP 要求	✓ *更廣泛的範圍要求	✓
三	TQF 驗證機制 <ul style="list-style-type: none"> <li>現場評核-設備/方法/人/原物料 (系統評鑑)</li> <li>產品檢驗-<b>淨菌生菌總數</b>檢驗</li> <li>*詳細檢驗項目及檢驗點 (衛生標準/關注項目/品質規格)</li> <li>*依照食品類別不同，制定28項標準技術規範及產品檢驗標準。</li> </ul>	✓	✓	△ *要求更詳細產品安全檢驗 *崗位及品質要求
	授權第三方 驗證機構 <ul style="list-style-type: none"> <li>食品工業發展研究所FIRDI</li> <li>中華農林食品工業技術研究所CGPRDI</li> </ul>	✗	✓ <b>勝</b>	✓
	委託第三方 驗證機構 <ul style="list-style-type: none"> <li>TAF全國認證基金會 (為全台灣唯一具稽核驗證單位符合國際標準之認證機構，與IAF互相關司)</li> </ul>		✓ *公正公開的第三方	
四	簽約統台台灣優良食品驗證制度 (TQF) 產品驗證證書 <ul style="list-style-type: none"> <li>遵守TQF會員規範及共同維護食安尊嚴使命</li> <li>*違反合約之使用規範將依法究辦</li> </ul>	✓	✓	✓
五	向協會申請 驗證標準使用	✓	✓ <b>勝</b>	✗
六	產品上市，建立品質履歷追蹤追溯	✓	✓	✓
七	追蹤管理 (至少1年2次) <ul style="list-style-type: none"> <li>後市場監測</li> <li>無預警現場抽樣稽核-<b>工廠現場評核</b> -<b>產品抽驗</b></li> <li>*異常之顧客，將於48hr內提供改善方案及後續作業。</li> </ul>	△	✓ <b>勝</b>	✓

■ 為TQF驗證後與過去FGMP的差異(增加之驗證管理機制)  
 ■ 為符合國際GFSI食品安全管理之標準要項  
 △ 規範內有要求但不完善  
 ✓ 規範內有要求之重點項目  
 ✗ 規範內無要求之重點項目

Figure 2.1: Even Certification scheme owner itself compares two different things: TQF and GFSI, one is a certification, the other is an initiative.<sup>1</sup>

### 2.1.3 Increase Consumer Trust

The author studied several cases, looked into the examples of increasing consumer trust, and how these connect to Food Safety issue. The research found out three main methods, 'Communication', 'Storytelling', and 'Quality'.

<sup>1</sup><http://www.tqf.org.tw>

## Communication

This research categorizes three ways for communication with the consumer: Flexible structure and open mind, Been honest and helpful, and Leverage consumer-generated content. In recent years social media had been very disruptive to consumer relationship management. [36] Companies try to keep in touch with consumers, let them know more, and generate loyalty. Organizations from all sectors are trying to connect and communicate with consumers in their marketing. (e.g. Oreo, McDonald's, IMEI, JetBlue, Starbucks).

With flexible structure and an open mind to the system, take Oreo and McDonald's for instance. Oreo, the world known cookie brand, engages its customers in playful conversation on Twitter. Consumers are delighted when a company takes the time to speak with them, not to mention in a fun way. With the "Our Food. Your Questions." digital platform, McDonald's consumers are encouraged to ask their variety of questions. In exchange, McDonald's promises to step up and provide clear and concise answers. It is the approach that can silence the harshest of critics, turn a fence-sitter into a fan. They can even change the strategy base on consumer feedbacks and react to the rumor or intentional attack immediately.

Second, being honest, and helpful, create the transparency to the public. When something happens to the product or service, what will the company tell the consumer? Take IMEI for example, although they are ranked as the best food company in Taiwan, but still happened the Food Safety incident. They apologized at the first moment and told the reason, also released the relative information. Consumers would not trust them without the continuous interaction and honesty. IMEI spent time crafting genuinely helpful replies in social media rather than just dropping links all over the place. The other example is JetBlue. They respond quickly to customer questions on Twitter. They are there to help without any days off just like their airlines. JetBlue is promoting their brand by having great customer service. It is a win-win: customers get service on Twitter, while JetBlue publicly displays their quick and responsive service.

Further, Hoyer(2010) mentioned 'Consumer co-creation', consumers help co-create products, services, value and provide access to vast amounts of data and new insights about customers [20] IBM's Global CEO Study found that 88 percents of CEOs said "Getting closer to customers" was the top priority for their

business. This can be done, largely, by leveraging user-generated content. Share consumers' contents in order to give the audience exactly what they like to see and experience. Starbucks engaged fans and created some beautiful content when they launched a stunning White Cup Contest where fans were proposed to paint and submit their photos to social media. As a result, the brand received wonderful visual content for its Facebook and Pinterest and increased their communication with consumers.

## Storytelling

Stories attract people to understand more, to make connections with others, and to find meanings in lives. Before building the consumer trust, it is important to raise their interests. Storytelling is the powerful tool for consumer interests and since they agree, therefore generate the consumer trust. Apple is destined to make it onto this list. And as for Steve Jobs, his life and work had inspired the research of storytelling. Apple can tell a great story, and often, Steve Jobs was the one who told those stories. Today, Apple continues Steve Jobs' tradition of storytelling. But this time Apple weaves their products seamlessly into the story. Furthermore, it shows how their products help people create their own stories, and Apple highlights the stories people created. Apple is providing a platform for their customers to tell the brand's story, a technique that can produce the most authentic and engaging results.

Airbnb's contents are totally focused on people, who own the homes and the travelers who go there. They show how connecting with others is important to their brand and how their brand makes that possible. It is a very human approach, and it works perfectly. [1] Airbnb is also experimenting with a brand magazine called Airbnbmag. It is a platform for the incredible stories from Airbnb's extended family to be shared. It is somewhere for readers to see how people live and create connections in cities today. There is a truly genuine element running through Airbnb's content. They focus on the stories and on the people, recognizing that this is the language by which humans communicate, so that is the approach that will attract more customers. There is also a truly genuine element running through Airbnb's content.

## Quality

'Made in Germany' represents the best quality to large numbers of people. Consumers trust German products due to the strict quality and standard. German products also represent the best in every area such as suitcase with RIMOWA, a camera with Leica, Kitchen with Gaggenau. Even consumers do not understand the technical detail about it, they still trust 'Made in Germany'. In early 2017, Statista, in cooperation with Dalia Research, surveyed over 43,000 consumers from 52 countries, in one of the world's largest and most comprehensive studies on international trade. [30]

'Made in Germany' takes first place and is, therefore, the world's leading quality label. It was originally introduced 130 years ago in Great Britain to protect the nation's market from cheap imports and warn domestic consumers of counterfeit products from Germany. Ever since then, the popularity of 'Made in Germany' has risen steadily. Today it is more powerful than ever. The label's first-place position is mainly based on the positive ratings in the product categories of 'Quality' and 'Security standards' along with the overall popularity of 'Made in Germany' across many countries in the world: Germany holds the number one position in 13 countries. People believe German product is rigorously managed with high quality. Switzerland is in second place and received very high ratings from around the world in the categories of 'Status symbol' and 'Authenticity' in particular. Italy excels with regard to design, while Japan received the best-advanced technology ratings of all countries. China outshines others regarding 'Price/performance ratio'.

## Discussion

Increase consumer trust in Food Safety is different from other cases, cause the main purpose is not to raise the consumer purchase intention, but to let consumers believe this system control the Food Safety better. The current Food Safety Management System does not really communicate with the consumer, there is no space for consumers to participate or express. The study found out that system should involve consumers in co-supervising by welcoming the opinion from them. The scheme owner of certification has to be open mind and release the relative

information to consumers, to see is always to believe, not to mention to involve. The system should not stay far away from consumers, through storytelling, or the story generated from system operation is the point to attract consumers, and create the interests. The most important part is how to maintain the quality. Consumers believe that products made in Germany go through the precise and rigorous standards and management, due to the satisfied and consistent performance. In product part, is about the quality, but in system part, the attitude and way to address the problem are considered as the point toward increasing consumer trust.

#### 2.1.4 Measurement of Consumer Trust

Lang and Hallman(2005) apply quantitative research toward consumer trust. They used a computer-assisted telephone interview and conducted a follow-up mail survey to allow for a more thorough understanding of specific topics. Chien(2011)'s research of "Consumer trust in group buying" was conducted via questionnaire. Except for the background and consumer experience, it was a closed question structural questionnaire, designed with five level of measurement and Likert scale.

According to Mason's "Qualitative interviewing"(2002), consumer trust relates to a certain cultural and social context, the facts and context cannot be divided into two, study of consumer trust requires in-depth qualitative research. [31] In order to achieve good interview performance and take into account the openness and flexibility of dialogue interaction, this research follows Jiang(2014)'s research: "Consumer trust in Safety of Agricultural Products", applied qualitative and in-depth semi-structured interviews. [42] Through interviews and interactions to build knowledge about consumer trust and share the same meaning and understanding.

To analyze the gap between Food Safety and consumer, moreover, the deeper understanding toward consumer trust, this research apply three kinds of trust sources: Interpersonal trust, Organization trust, and Institution trust. [37]

- **Interpersonal Trust:** Interpersonal trust happens between human interaction, by the accumulation of interaction time between two sides, and gradually generates the intention to trust each other. [29] People trust others base

on credible evidence or emotional behavior. It has positive impact on the mutual benefit of knowledge sharing motivation. [40]

- Organization trust: Andaleeb and Anwar(1996) defined the organization trust refers to customers' reliance on the organization's image and the shopping experience before. [11] Smeltzer(1997) indicated the organization trust between consumer and supplier is the organization image, organization reputation, an organization identity. Initially it would seem logical that reputation would have the same connotation as image and identity. [35] If a supplier survey indicated that the buyers were not trustworthy —for instance, they changed their demands frequently —then the buyers would alter their identity and image accordingly.
- Institution trust: Consumer believes supplier will behave well because it is under the supervision of an institution. Doney, Cannon, and Mullen (1998) considered institution trust as the description and result of how external environment affects the individual trust. Due to the society exist the credible institution and certification system, make sure the given party has the certain ability. [15]

## Index

Studies of trust in the system primarily focus on identifying which factors influence trust judgments. Lang and Hallman's research (2005), integrated the perspectives from Luhmann, Barber and Gambetta, and proposed four elements to measure trust, including competence, transparency, public interest and honesty of suppliers and organizations. Those are frequently discussed in previous work on trust.

'Competence' measures the respondent's judgment whether an institution has the knowledge and skill to evaluate information accurately and to take appropriate action. 'Transparency' measures the perceived openness of communication from an institution. 'Public interest' measures the degree to which respondents perceive an institution acts without bias when faced with conflicting social norms. 'Honesty' measures the extent to which an institution is truthful about risk. Trust is undermined by perceived shortcomings in any of these four criteria.

By including these four items, the research intended to capture much of the theoretical meaning attributed to trust in the social science literature. The list below corresponds to the issue of this research about Food Safety.

- Competence: Holds the ability and professional expertise to manage the Food Safety.
- Transparency: Release the information of Food Safety Management System transparently to the consumers and society.
- Public interest: Make the decision base on public interest, right and benefit.
- Honesty: Speak out the truth and take the responsibility when the incident happened.

For interviews flow Design, this research follows Patton(2002)'s method, divides interview questions into six types: experience and behavior, opinions and values, feelings, knowledge, senses, background and demographic variables. [33]

### 2.1.5 Short Summary

In terms of the literature review, the author has a better understanding of the concept of trust. In addition, trust plays a very important role in consumer behavior and trading relationships. Jones pointed out in Harvard Business Review(1995) that attitude of consumers will further contribute to behavior, which affects the purchase intention and customer loyalty, including the purchase frequency, the number of purchases and the repurchase rate, and other derivative behavior such as recommendation. [24] Purchase intention will be affected by the cognition-based trust and affect-based trust which means higher interpersonal trust raise the purchase intention. [12] Consumer trust plays a very important role in the trading relationship, and the two sides can maintain a good relationship with trust and support the long-term interests of industry and consumers. [17] Most of the consumers have less knowledge in Food Safety, therefore, rely on person, organization, and institution they trust. Due to the Food Safety incidents happened continually, consumers became more critical and suspicious. They trust non-profit organizations such as university and experts in a certain area more than



government and company. The author looked into how other fields increase consumer trust and found out the important elements.

- Communication with consumers toward the open mind, let them get involve and further leverage consumer-generated content.
- Storytelling is an effective way to attract people to understand and further generate the story relate to themselves.
- Quality maintain mechanism, let consumers trust the credibility of the system.

Accordingly, in the modern society, which is full of Food Safety risks, if there is a better understanding within consumer trust, it will be helpful for Food Safety Management System and the Taiwan food industry.

## **2.2. Food Safety Management System in Taiwan**

Certification in Taiwan mainly divided into four categories, Traceable Agriculture Product (TAP), Organic Certification, Taiwan Quality Food(TQF) and Certified Agricultural Standards (CAS). Organic Certification is more like food quality, therefore it will not be discussed in this research.

### **2.2.1 Traceable Agriculture Product**

Traceable Agriculture Product(TAP) started from 2007, the history can be traced back to 1996, Europe occurred the 'Mad cow disease'. [44] Under EU regulation, 'Traceability' means the ability to track any food, feed, food-producing animal or substance that will be used for consumption, through all stages of production, processing, and distribution. [16]

Traceability is a way of responding to potential risks that can arise in food and feed, to ensure that all food products in the Taiwan are safe for citizens to eat. It is vital that when national authorities or food businesses identify a risk they can trace it back to its source in order to swiftly isolate the problem and prevent contaminated products from reaching consumers. In addition, traceability allows targeted withdrawals and the provision of accurate information to the

public, thereby minimizing disruption to trade. Past food crises, such as dioxin contamination and BSE, have illustrated the particular importance of being able to swiftly identify and isolate unsafe foodstuff.

## **TAP Discussion**

TAP is kind of prerequisite program for part of Food Safety and mainly focus on the primary agricultural product. There are three problems on TAP now. The process of the TAP is to make the record of everyday field activity in every detail, it relies on human work, which means the high potential to make the mistake or wrong record, worse, without spot check no one can ensure the accuracy. Second, TAP is exclusive, only when all the ingredients use the TAP ingredients can apply to TAP processing food. The last is limited controlling, cause Council of Agriculture made the detail operation of each object, if the vegetable or fruits farmers are growing are not on the list, they can not apply for the TAP. What TAP is doing really well is the label, it provides the essential information for consumers.

- Certification Category
- Producer of product
- Name of certification body
- How to know it is still valid?
- Where to check more information?

Third-party certification of TAP opens to the market, eventually it became more competitive and transparent, although it is nearly the same, still can let consumers have the opportunity to choose which body they trust.

### **2.2.2 TQF and CAS**

Taiwan Quality Food (TQF) is the modification of GMP, which established in 2015. GMP is a prerequisite program for Food Safety Management System, there are some more similar prerequisite programs such as GAP, GVP, GHP, GPP GDP

and GTP. [3] Taiwan GMP originated from US GMP. After the modernization in 2004 and 2005, US GMP did not change any part until now which shows the stable of it. [9] GMP is kind of domestic principle rather than international principle, which means due to the cultural background and dietary habit, the detail of GMP might change. But it is possible to connect the world through TAF and IAF. The difference between TQF and GMP are source management, third-party certification, trace management and all products in same production line should go through certification. In EU, US, Japan and Southeast Asia, they made GMP as mandatory, which meant GMP became the trend. To gain the GMP certification spend not only time but cost, and the new facility, the big company holds the necessary resource and technology for GMP, but for small-scale business, it is the huge entry barriers.

Certified Agricultural Standards(CAS) focuses on domestic food and ingredients, which is the main difference between TQF and CAS. At the beginning, the purpose was to promote domestic material. After that, it added in the requirement of Hygiene, Quality and Package Label. There are distinct regulations for different products, therefore CAS derived various of labels. Once in 2004, Consumers' Foundation lodged a claim against scheme owner of CAS which is Council of Agriculture on consumers are confused by the messy labels. Council of Agriculture, therefore, merged the labels into the current CAS. The certification valid period is 3 years and can be renewed six months before it expired. In order to confirm that the certification body is in compliance with the certification standard, Council of Agriculture will implement the spot check once a year. After obtaining the certification, the company will be under the supervision and management of CAS, including the factory inspection and product testing. The certification body shall carry out regular and non-construction of the nine items of the production environment, facilities, machinery and testing equipment, process management, quality control, hygiene management, warehousing and transportation control, personnel qualification and training, other (such as packaging label). The results are divided into the general level, good grade, excellent grade and potential risk level. The tracing frequency will be different base on the level.

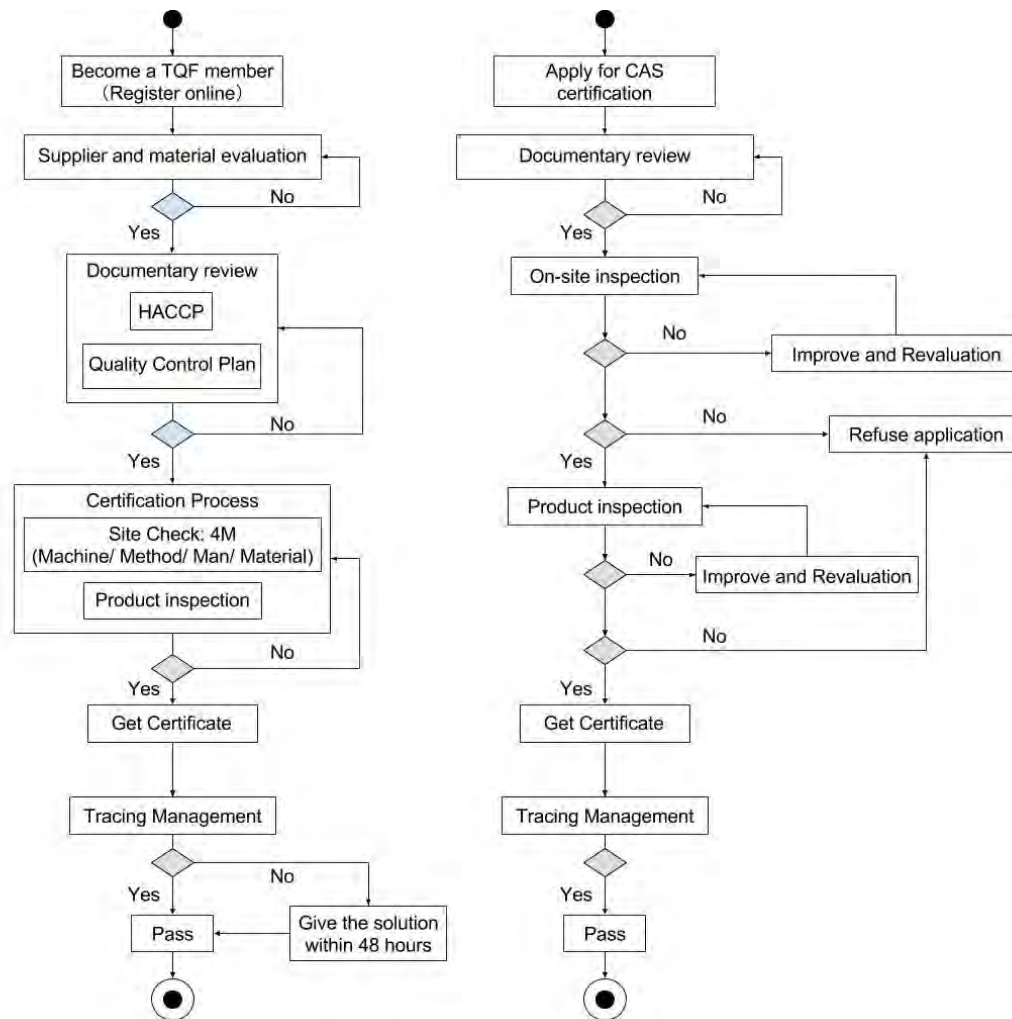


Figure 2.2: The system flow for TQF and CAS. Illustration drawn by this research.

## IAF and TAF

Accreditation is the independent evaluation of conformity assessment bodies against recognized standards to ensure their impartiality and competence. [6] Through the application of national and international standards, government, procurers, and consumers can have confidence in the calibration and test results, inspection reports and certifications provided. Accreditation bodies are established in many countries with the primary purpose of ensuring that conformity

assessment bodies are subjected to oversight by an authoritative body. Accreditation bodies, which have been evaluated by peers as competent, sign arrangements that enhance the acceptance of products and services across national borders, thereby creating a framework to support international trade through the removal of technical barriers.

The Taiwan Accreditation Foundation (TAF) is the only body in Taiwan recognized by the government for the accreditation of conformity assessment against international standards. As a non-profit and self-funded organization, TAF offers third-party impartial, independent and transparent assessment services. TAF plays an important role in various international accreditation co-operations and has a significant connection to other accreditation bodies, regional bodies, and accreditation-related organizations. The TAF accreditation symbol is recognized and supported by government and industries.

The IAF is the world association of Conformity Assessment Accreditation Bodies and other bodies interested in conformity assessment in the fields of management systems, products, services, personnel and other similar programmes of conformity assessment. In short, TAF international version. Its primary function is to develop a single worldwide program of conformity assessment which reduces the risk for business and its customers by assuring them that accredited certificates may be relied upon. Accreditation assures users of the competence and impartiality of the body accredited. There is 'Multilateral Recognition Arrangement' between IAF and TAF, which means TAF accreditation is possible to apply internationally, and benefit to international trade for the company.

## **TQF and CAS Discussion**

Even if TQF modified the insufficiency of GMP, it did not solve the problem. 'Old wine in the new bottle' is how TQF described. It made the process of certification more complicated, but due to the Food Safety incidents, consumers already have no confidence in current certification system, they would not spend the time to understand the new process. More stakeholders and department get involved, they pass the buck to each other, for example, when the Food Safety incidents happen, the administration will be different due to the location, in the field, factory, supermarket or consumer. In the other hand, since the GMP was

abolished, Taiwan was placed in the bad situation of international trade, due to there is no TQF in other countries. Taiwan made the unilateral standard, which is not recognized by other countries. [45] Originally, the main supervisor and scheme owner of GMP was government, since the TQF established, it became a non-government organization, which is the interest group. It is the scheme owner of TQF but also does consult, promotion, which makes society question the credibility.

The contents of CAS are really similar as TQF, but CAS is the product base certification, which does not really work in consumer trust, consumer trusts a company or brand rather than a single product. Further, no matter TQF or CAS it is voluntary and only provides the certification, which makes no motivation for the company to join. The certification relation is weird, scheme owner doubling as the promotion, third-party certification body got the revenue base on more consumers passes the certification. Therefore the certification became a paperwork, followed the checklist and be prepared for the inspection, everything will be fine. In addition, paperwork can not find out the potential risk, it is why there are lots of cases that illegal productions exist for a long time and no one knows.

## 2.3. Participatory Guarantee System

The term Participatory Guarantee System (PGS) is relatively new —coined after the joint IFOAM-MAELA Alternative Certification Workshop in Torres, Brazil, in 2004. Over 40 participants representing PGS initiatives from 20 countries attended and many of these were well established by that time. Some PGS, like the Nature et Progrs in France, has been around since the 1970s. Others were established in the 1990s and most of the rest were established in the last 7-8 years. It is a locally focused communicational system between consumer, supplier, and platform. The platform involves consumers, suppliers and some expert, it makes the standard with participators, sales the products, and manages the Food Safety. PGS can apply locally, reach every corner that normal certification is not able to. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks, and knowledge exchange. [21]



Figure 2.3: The key elements and features for PGS.<sup>2</sup>

<sup>2</sup><https://www.ifoam.bio/en/pgs-basics>

### 2.3.1 Consumer in PGS

Consumers are integral to the operation of a successful PGS. There are six key elements of PGS, which published by IFOAM. [22] All of them are related to the consumers.

- **Shared Vision:** It is the fundamental strength of the Participatory Guarantee System. Suppliers and consumers have the same vision of managing the quality, which will become the guidance of the program.
- **Participatory:** PGS based on intense involvement by those interested in the production and consumption of these products. Principles and rules for production are conceived and applied with the contribution of all stakeholders, producers, consultants, and consumers. The credibility of the production quality is a consequence of participation.
- **Transparency:** All stakeholders, including farmers, must be aware of exactly how the guarantee mechanism generally works, the process and how decisions are made. This does not mean that every detail is known by everyone but rather a basic understanding of how the system functions. People should be aware of the criteria of how the decision on certification is made.
- **Trust:** The advocates of PGS hold to the idea that suppliers can be trusted. It should reflect a community's capacity to demonstrate this trust through the application of their different social and cultural control mechanisms, providing the necessary oversight to ensure the integrity of their suppliers. Thus, a variety of culturally specific (local) quantitative and qualitative mechanisms for demonstrating and measuring organic integrity are recognized and celebrated. These are integral to the certification process.
- **Learning Process:** The intent of most PGS has been to provide more than a certificate, also aiming to provide the tools and mechanisms for supporting sustainable community and development where the livelihoods and status of suppliers can be enhanced. It is important that the process of certification contributes to the construction of knowledge nets that are built by all the actors involved in the production and consumption of the organic product.



The effective involvement of farmers, consultants, and consumers on the elaboration and verification of the principles and rules not only leads to the generation of credibility of the product, but also to a permanent process of learning which develops capacities in the communities involved.

- **Horizontality:** It means sharing of power. The verification of the organic quality of a product or process is not concentrated in the hands of few. All involved in the process of participatory certification have the same level of responsibility and capacity to establish the quality of a product or process.

The exact role varies but includes helping with the initial development of the initiative, including standards and systems, to ongoing involvement in local, regional and national meetings, to participating in revisions and on-site farm appraisals. In some countries, consumers play an active role in distribution by running PGS cooperatives.

In addition, PGS initiatives make use of social control, which is effective only when local stakeholders have ownership and a direct hand in the certification mechanisms (as opposed to being answerable to a distant authority.) This requires locally based and non-hierarchical certification structures and mechanisms appropriate to the social context they are operating in. Finally, all PGS include guided on-site inspections.

### **Difference with Third-Party Certification**

It is first essential to acknowledge that no system of certification or quality assurance is perfect. Farming is often a solitary profession, therefore, unscrupulous people that want to cheat can generally find ways to do so. The PGS approaches quality assurance begins by looking at the primary factors behind most non-compliant actions. These include a lack of understanding, knowledge, and techniques to solve specific production problems. Compare to third-party certification, PGS addresses these factors in a variety of ways, but in general, they are based on guided peer review and support, as well as mutual knowledge building. [25] Third-party programs are doing an excellent job at what they were designed for and have vastly increased the global market and awareness of organic products. PGS offers a complimentary, low-cost, locally-based system of quality

assurance, with a heavy emphasis on social control and knowledge building. PGS, as a complementary method to third-party certification, is essential to the continued growth of the organic movement, especially to include poorer small-holder farmers who have the most to benefit from organic. It is ironic that in many countries the number of acres under third-party organic certification increasing quickly, while the number of certified organic farmers is hardly growing. Based on these numbers it would appear small-holder farmers are less interested in joining the organic movement than large agribusiness farms. Of course, this is not true, it is only the process of third-party certification that smallholders are less interested in. Barriers to entry for third-party certification, including direct costs and paperwork, mean that many of the smallest and poorest farmers, those that have the most to gain by joining a system of committed organic production, cannot participate, and this hurts the growth of the organic movement as a whole.

There is no international accreditation by IFOAM or any other agency for PGS initiatives. In fact, a key characteristic of the PGS movement is that they are locally focused and non-hierarchical, so the idea of accreditation does not seem appropriate. However, IFOAM has developed a quality review system for PGS initiatives and offers an official IFOAM recognition to the applicant PGS initiatives that successfully pass an evaluation done by IFOAM and the IFOAM PGS Committee.

### **2.3.2 Discussion**

To differentiate from normal certification, two characteristics make PGS able to apply locally and gain the consumer trust. First, communication to the consumer, they get involved in the cycle and take part in the decision of PGS standard, besides, due to the participation in the field and production process, to see is to believe, the transparency therefore exists. The consumer can also add in some other consideration, for example, animal welfare. The communication not only increases consumer trust but also confidence and be proud of what they are consuming. [46] Second, unlike the expensive and complicated third-party certification, the flexibility and low cost of the system allow small-scale businesses to join, compare to the big company they are also closer to consumers. Certification nowadays led by the third party, go through the scientific way to the objec-

tive result they claimed. The stakeholders in this Food Safety certification from suppliers to the consumer and even government, all of them are just passively informed the result. It is a consistent principle, which does not fit the diversity of production. With the communication process and flexible structure, PGS is bound to have an even broader prospect for development. [47]

For every plus, there is a minus, mainly three problems exist in PGS now in Taiwan. First is about the government. In India, PGS is recognized as the formal certification, which holds the same power as the third party certification, though, not in Taiwan. [27] the other word, the government is not managing the PGS, which means beside the platform, no one can make sure the system is working properly. The other is due to the region revitalization policy in Taiwan, PGS became a way for tourism marketing but in fact, it should focus more on Food Safety management. Second, the PGS now in Taiwan remains in minority, the PGS platform is isolated, they have their own language, rules and somehow relate to religion, which is inaccessible to the public. Also, the organization mostly is not professional, which makes consumers take the suspicious attitude. Last but not least, one of the keys to current PGS is the participation of consumer. PGS requires the active consumer to be involved, but in the modern society, people have no time for it. Even for holiday activity, they tend to go somewhere to relax rather than 'Learning process'. To sum up, PGS has to connect to the government, with the professional and credible platform, and reduce the requirement of consumer participatory.

## 2.4. University Role in Food Safety

University maintains an important role in Food Safety to connect consumers. University is experimental and researches place before a policy comes out, it starts earlier than others to find out the problem. Takes a comprehensive approach to providing training and conducting applied research to support the food industry, from farm to fork, in reducing foodborne illness risks. Also provides fundamental, science-based, on-farm Food Safety knowledge to fresh fruit and vegetable farmers, packers, regulatory personnel and others interested in the safety of fresh. [39] The role of the university in Food Safety divided into consulting and third-party

certification in Taiwan.

### 2.4.1 Consulting and Training Role, NTU

In order to build an independent, objective and transparent Food Safety research, and strengthen the communication between government and consumer, National Taiwan University establishes the Agricultural Planning and Development Research Center. Before 2015, there was Food Safety center in National Taiwan University, the reason it is not operating will be discussed in concept chapter within the interview with Prof. Hsu.

Taiwan University Agricultural Planning and Development Research Center dedicated to the integration of agricultural resources and to provide farmers a correct knowledge, technology, and discrimination toward the source. Further, builds a communication between producer, government, and academics. There are mainly five tasks:

- Assist Council of Agriculture in TAP counselor training and employee training.
- Undertake the agricultural extension from the government.
- Integrate the resource within Taiwan University College of agriculture.
- Consulting service toward agriculture.
- Consulting service for small-scale production, to increase the Food Safety and hygiene. (According to the author's study, this service is not officially working.)

### 2.4.2 Third Party Certification Role

Third-party certification of TAP and Organic opens to the market, which brings in various of participators. With the capability and resource, some universities, therefore, joined the competition.

- NCKU Green-Product Certification Division Green product certification division, NCKU started in 2007 under advanced power system research center.

They were working on electrical hazardous substance testing such as radiation, water, and soil heavy metal testing, besides, collaborated with industry to build up the testing system. Since 2009 they got the accreditation from the Council of Agriculture and TAF, they started the organic and traceability agricultural product certification. NCKU does not have agriculture department, which means the third party certification does not limit in university to the agriculture department. It occurred the serves problem in 2015 after the problem was fixed, they still exist now and even growing up, which pointed out the stable consumers trust in University.

- NPUST CAAPIC: National Pingtung University of Science and Technology is known as the connection to the society. They have the good relationship with local and food industry, most of the professors in NPUST collaborate with the company, which make the university culture very practical. The establishment of 'Center for Agriculture and Aqua-cultural Product Inspection and Certification(CAAPIC)' is to support the Aqua-cultural Product company for drug residues testing and hygiene inspection. With the expertise and high consumer trust, they produce their own product which always sold out very soon.
- NCHU APACC: National Chung Hsing University(NCHU) is an agriculture-based University which established in Japanese colonial period. Incorporate with government policy of Food Safety, the Agricultural Products Approval and Certification Center(APACC) established in 2007, Under College of Agriculture and Nature Resources, focuses on third-party certification and offers the service of TAP and Organic certification. Except for the certification business, NCHU also working on education and training courses to build up more experts for the industry.

### 2.4.3 Foreign University in Food Safety

Wageningen University in Netherlands is one of the leading centers in Food Science and Technology in Europe and the world. The Food Safety programme of the university was the first MSc in Food Safety worldwide, which is unique, with a highly integrated approach to the field of Food Safety. The programme

in Wageningen focuses on the technical aspects, as well as on the legal aspects of Food Safety and integrates these in Food Safety Management. They also have food science training collaboration with Nanyang Technological University in Singapore. [8] The Institute of Food Safety in Cornell University harnesses Cornell's existing strengths across food production systems in fruits, vegetables, dairy foods, and entrepreneurial support to help growers and processors comply with the demands of the U.S. Food and Drug Administration's Food Safety Modernization Act. By helping the food industry meet federal regulatory requirements and produce safe products, the IFS supports economic growth across all food sectors including produce, juice, and dairy, allowing for increased production and novel food product development. [7] Johns Hopkins University has the Master of Science in Food Safety Regulation, is designed to provide students with an understanding of the legal and regulatory complexities of food production, labeling, and distribution. The program mainly focuses on the knowledge required for companies and organizations that grow, process, distribute, or sell foods and beverages while complying with federal and state regulatory statutes for the production, distribution, and commercialization of food products. [5] In Japan, Tokyo University, Research Center for Food Safety, focuses on four research areas related to Food Safety: Radiation Science, Risk Assessment Science, Risk Control Science, Information Science, and Economics. They actively provide information to the general public, government, private sector, and training experts. There is also the collaboration with domestic and foreign organizations. [2]

Due to the difference in culture and legislation, universities role in Food Safety in Europe, Japan and US are basically pure research and education. It is more likely from food science perspective, and include the collaborative development of the company. There is no denying that there are some professors working on Food Safety management with the industry, but it is not a university scale. Cornell University has the assistance toward helping the industry to meet FSMA, but it is still the consulting service base on Federal legislation.

#### 2.4.4 Discussion

With the expertise and non-profit factors, consumers trust the university. University provides various of lectures and training which open to public brings the

issue closer to the society and create the transparency of Food Safety knowledge which is the essentials elements of consumer trust. According to interview with the Food Safety division coordinators in universities, the research found out that big company prefers to ask private enterprise for certification rather than the university. The reason is with non-profit characteristic university operates the process step by step, which also makes more consumer trust. Big company which holds the knowledge and resource need more flexibility, on the opposite, small-scale business which has less ability and funds need stage by stage consulting service and assistance. University tackles this issue and able to help. The non-profit and local connection characteristics make the universities gain more consumer trust and manage the Food Safety efficiently. One of the evidence is the campus agriculture product center always sold out every day. The soy sauce which selling in NPUST even became a company. In terms of the result of TAP certification, there are six universities involved in the certification body lists. There is a list of TAP pass numbers, within the fourteen certification bodies, three universities are in the top five. It is a pity and also the problem that university in Taiwan only working on what government encourages to do, they only work on third-party certification, and training or education course. Foreign universities are the more likely focus on education and research.

## 2.5. Contribution of the Research

Food Safety Management System now in Taiwan is not designed from the consumer perspective, therefore, consumer trust is the main lacking point. The distance and knowledge gap generate distrust, further, Food Safety incidents happen continually, and consumers tend to hold the suspicious attitude toward government and company. The design for consumer trust included communication and understanding with consumer, storytelling to raise the interest and let consumer understand the quality. The most important part is the Food Safety Management System is too far from consumers, distance generates the estrangement which is the obstacle to trust. Further, due to the Food Safety incidents, consumers already have no confidence in current certification, they would not spend the time to understand the complicated process and new system. In modern society, people

are busy and they only trust and concern about the things which close to them. PGS let consumers get involved in the system and take part in the decision of standard, not only increases consumer trust but also confidence and be proud of what they are consuming. Anything is a double-edged sword, current PGS requires active consumer but in the modern society, people have no time for it. Under the PGS structure, the system has to take care of both consumer trust and reduce the activity. The non-profit and local connection characteristics make the university gains more consumer trust and controls the Food Safety efficiently. If the University can use their advantage toward consumer trust, it can tackle the research purpose properly. University role in Food Safety now in Taiwan only stay in working on what government encourages and asks to do, they need to take the initiative, contribute the society, simultaneously apply the academic into reality.

Compared to a big company, the small-scale business is closer to consumers, therefore it is the main target to manage. The certification now in Taiwan is too complicated for the small-scale business, they lack operation skills and resources. Due to the fact that certification body can not do the consulting, the site check and tracing management became a paperwork, which can not find out and be prepared for the potential risk. PGS somehow solve the problem mentioned above but there is no motivation, reason for a small-scale business to join, they even do not know about PGS, therefore an institution which closes to them and able to assist is needed.



# Chapter 3

## Concept

The overall concept is a university-based Food Safety Management System which is designed for increasing the consumer trust towards the Food Safety in Taiwan. The first version is divided into 'University Certification', 'International Standard', and 'Government Supervision'. Based on the understanding from the literature review, the first illustration of the concept is given. After fieldworks and stakeholders interviews, the concept and design were improved. The second version integrates the three concepts 'University Qualification', 'Consumer Friendliness', and 'Government Supervision', into Academic Participatory Guarantee System(APGS). These concepts gave the solution for the missing parts of the current system, modified PGS and designed for consumer trust. The design concept discussed in this chapter will highlight the system feasibility and method towards increasing consumer trust, and eventually, describe the details of APGS elements which were implemented in the evaluation.

### 3.1. Design Concept: First Version

The first version of the Food Safety Management System design included 'University Certification', 'International Standard' and 'Government Supervision'. They tackled the issues of increasing consumer trust and shortcomings identified from the literature review.

The key idea of these three concepts is to extend the participant's concern and raise consumer interests. Food Safety is linked to the presence of food-borne

hazards in food at the point of consumption. Since Food Safety hazards can occur at any stage in the food chain, it is essential that adequate control is in place. Therefore, a combined effort of all parties through the food chain is required.

To eliminate the distrust, it is difficult to ask consumers to study the knowledge of Food Safety, instead, shorten the distance is possible. Government and certification body is far away from consumers, however, the university has the advantage in local connecting. According to Ministry of Education, there are currently around 200 universities in Taiwan which locate in every city and county. [4]

People attend the event, go for jogging, interact with students and participate the open course from the closest university. Due to the government and food company lost the credibility, within the 'University Certification', the university is selected to operate the system, which is a neutral and authoritative institute toward the society. Certification bodies and PGS groups located in different place in Taiwan, which is too far away from consumers. With the regional factor, students and activities enable the university to communicate and connect with the local society and residents. In the other hand, the university already working on assistance and consulting service for the society which is in need of the current system. The author believed more interaction with educational institute creates consumer trust toward the company.

Due to the consumer in Taiwan trust developed countries more than domestic solution. The concept of 'International Standard' assumes that companies export products to foreign country can increase the consumer. The products which are sold to developed countries has to pass the local regulation, it creates the feeling of this product is consumed and recognized by developed countries to consumers. Further, university can make a flexible and wise use of the sister school connection in developed countries to build the exchange opportunity for not only the product but students and research. Last but not least, the university is considered as the neutral institute, however, still need the supervision to stay fair and credible, and the government is the only candidate in this case. Currently, the government holds the Food Safety Management System and supervise the certification body. The certification body is more likely the implementation unit without taking the initiative. In the first version of the design, the university was considered as the scheme owner of their own certification, there is no relation with the government.

Under the free market economics, the company will do their best for profit and reputation, similarly, if the university can control the whole system, they will operate the better service within the competition. Normally, the consumer will evaluate the company and affect the market, but most of the consumers have less knowledge of Food Safety, therefore, the role should be substituted by others. Originally, the government is working on inspection and unannounced check, therefore, it is the most suitable unit to supervise the system. Give the university freedom to develop the unique certification and deep plow within the society, meanwhile, government works independently to keep an eye on the system.

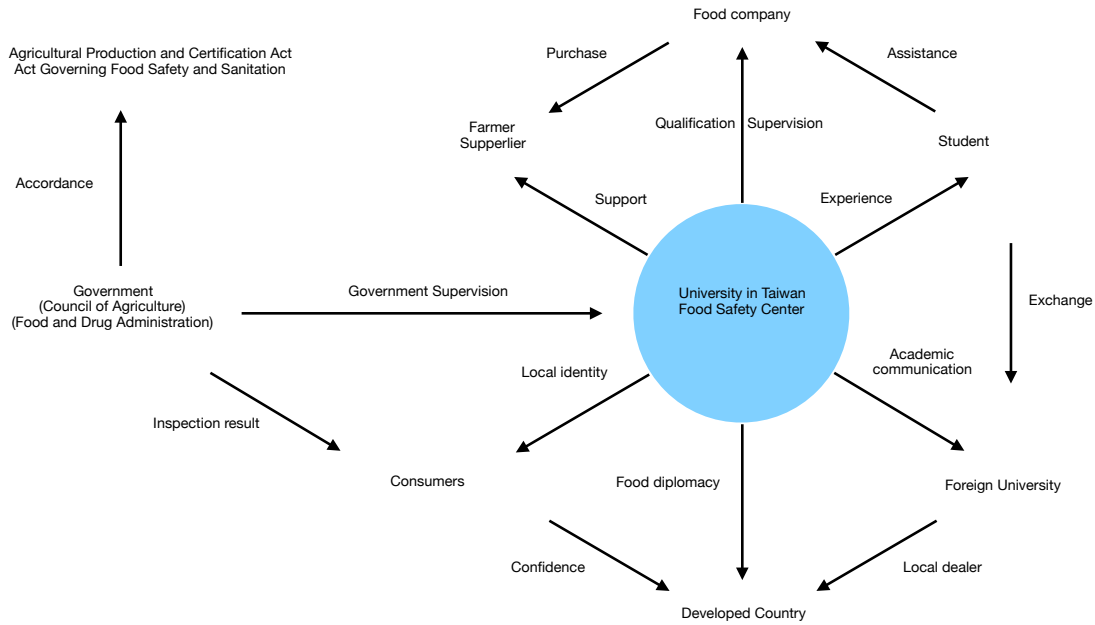


Figure 3.1: This chart was used to explain the system within the first test.

### 3.2. Ethnography

This research was motivated by identifying the importance between Food Safety and the consumer, which still lacks in research. Except for PGS, other Food

Safety Management Systems are closed systems which mainly has four stakeholders involved. Typically, three of them, the Certification body, the Government, and the Company are active characters, they hold the system, and operate the processes. The government is the scheme owner of Food Safety Management System, and accreditation body accredited the certification body. The accreditation body is not considered as stakeholders in this research because they are not only working on Food Safety accreditation but also every area which needs the certification, in short, they only make sure certification body has the capability, and not involved in the certification process. Company or supplier has many reasons to apply for certification, for example, to meet the market request or increase the goodwill. They work in conjunction with certification body, submit the required document and follow the regulation to manage the production. The other stakeholder which indicates consumers, they are only told to recognize and trust the 'Certificate'. They have no idea about the detail as well as operation. Further, with less knowledge than other stakeholders, they are not able to participate in the system, therefore, generated the distrust toward the certification. The first test of concept chose the active stakeholders to analyze their opinion toward the feasibility of APGS, further, to understand their concern and trouble within the current process. Consumers were not involved in the first test because it is meaningless to go to them without the consistent understanding of the active stakeholders and the current system.

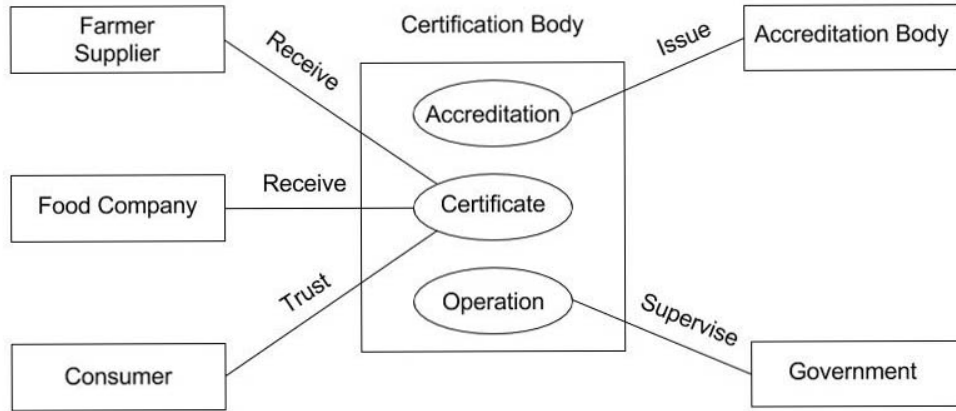


Figure 3.2: The relation drawing of current system. Created by this research.

### 3.3. Supermarket Fieldwork

In order to understand the consumer intention and trust, the author visited supermarkets for fieldwork conducted with unstructured and non-participant observation method. This method is used to understand a phenomenon by entering the target community or social system involved while staying separate without actively participating in the activities being observed. [26]

The author entered three kinds of supermarkets twice with some general ideas of what might be salient, but not of what specifically will be observed. Therefore, observation is holistic, unstructured, and unfocused, with the investigator attempting to document as much as possible. [19] The observational research was conducted during the 2017 June to August at Taipei and Kaohsiung in Taiwan. The supermarkets are shown as follows.

- 'PX Mart' is the locally focused market with small-scale space, in general, there is more than three PX market within a city or town. Target consumer is a housewife with daily purchasing.
- 'Carrefour' is the Large-scale supermarket, in general, there is only one 'Carrefour' within a county. Target consumer is family for weekly purchasing.

- 'Jasons' has the highest price for food in the industry it sells the best quality as well as the foreign and special product. It only open in the high-class department store in Taiwan, the target user is people who have enough money to live comfortably or care about the quality and brand of food.

The observation led to three common points as the results. No matter which supermarket, consumers tended to purchase the product from small-scale business rather than the big company. Nevertheless, most of the products from the big company had the certificate on them, while small-scale business products rarely had it. Due to the certifications are not integrated, therefore, it can be many certificates on a single product. Through the random talk with consumers, they did not recognize the certificate at all. Further, the author found out some companies created their own mark writing 'Organic' or 'Safety' or 'No toxic' which obscured the fact.

### **3.4. Feasibility and Pre-test, University Interview**

Two professors from National Taiwan university accepted the interview request. Prof. Hsu is the head of Food Safety Office in government, and director of Food Safety center in NTU before. Prof. Yeh was the member of NTU Food Safety Center before with significant authority over a Food Safety and Food Science academic unit. Two Professors hold the different attitude toward university operates the certification. Analysis of current system was conducted in the interview before went to the first test of design. In addition, Prof. Hsu Fuu gave the most important concept toward the research, which is 'Academic Participatory Guarantee System'.

In the view of Food Safety issues, Prof. Yeh shared an example from 'Arkema chemical factory', recently it happened the explosion in Texas, US. The factory held the Organic peroxide, which needed cryopreservation, but the system was destroyed by the hurricanes and flooding. The company announced to the residents within 1.5 miles to evacuate, eventually, no one was injured in the explosion. This case gave two good examples of the Food Safety issue: Disclosure the information, but not in alarmist way and minimize the scope of the incident.

### 3.4.1 Analysis toward Current System

Theoretically, certification products have a lower probability of problems, but there are still some shortcomings within the system. The certification system in Taiwan is in accordance with a 'Check List', which means follow the instructions and tick. This method falls short when trying to identify real problems and potential risks. The auditor should be on site rather than paperwork, from the conversation and observation with staffs, to find out potential security concerns, and to discuss the improvement. With the complete system of this, certification in Taiwan can reach the higher level. The Food Safety Management System can be divided into two in the world. Global Food Safety Initiative(GFSI) originated from EU and US Food Safety Modernization Act(FSMA). They are similar but have the difference in legally binding, GFSI is voluntary, the company can choose whether to apply for certification admitted by GFSI or not, but most of the market will ask the supplier to meet the GFSI standard within EU. In the other hand, FSMA is mandatory in US food chain, all the products include import and export have to follow the legislation. There are strong scientific support departments behind both systems. In Taiwan, Food and Drug Administration acts the role of scientific support, the standard it gives out should integrate scientific evidence and feasibility, but in fact, now it mostly takes the idea from media and society as a reference. This is the big problem within the government.

In compliance with regulation, consulting, promotion and certification can not be operated within the same institute, however, CAS and TQF are combining these three services. This is an international regulation but unrealistic, US and EU accept to offer both services since it is different auditor, but in Taiwan our auditor is freelance, therefore the regulation is only formally existing.

There is a conflict within current certification relationship, the main purpose for the third party is the revenue from certification, however, if they work consistently in the certification and company realize that this third party is too rigorous and passing rate is lower than others, they will apply for the alternative place next year. The Food Safety Label in Taiwan has the high potential for appreciation, it is the touch point for consumer toward the Food Safety. Lots of studies pointed out that consumers were willing to pay the higher price for the product with the certificate on it. In recent years, due to the Food Safety incidents happened con-

tinually which raised the public concern, the industry and government put lots of efforts. Although still some distance and incomplete from perfect, but the situation is changing due to the extension of concern in Food Safety. Both professors took the positive attitude toward the Taiwan Food Safety, they believed it will become better in the future.

### 3.4.2 Feedback of Design

”Take NTU for example, I disagree with NTU becoming a certification body. I believe the society will trust NTU, but since there is no 100 percent guarantee in certification, the credibility will crash when something happens, and lose its neutral position.” Prof. Yeh said. He considered university as a place for academics, education, and research. In his opinion, what the university can do is educate and offer scientific evidence from a neutral position and give accurate knowledge as well as ability in distinguish good and bad toward the society. Against from Prof. Yeh, Prof. Hsu held the view that university has the reputation, however, it would not crash with the single incident, the attitude and transparency toward the problem is the key which generates consumer trust toward the university. Rather than protecting the century reputation, the ability in taking the responsibility and social service, as well as industry collaboration, is the university role in modern society. The biggest advantage of school is the diversity, with various of the department they can create countless innovation and novelty. Besides, the university has the strong connection with the local residents, take NPUST’ s Soy sauce as an instance, with the support by the local consumer it always sold out in very short time.

Prof. Hsu pointed out that using the term certification will refer to the legislation, which may cause the system to be met with unnecessary interference. Use the word between certification and consulting, such as ’Qualification’. Although the ’Depth’ of ’University Qualification’ is not able to reach certification, with the breadth and advantage in consumer trust, it is possible to reach the targets that certification is not able to. Besides, rather than a part of the process within the production cycle, when Food Safety becomes a community in a local area, people will operate better under the mass surveillance and pressure from the interpersonal interaction. He suggested the future work should focus on financial and cost



issues, raise the feasibility and motivation for the university to join. University and other certification bodies are doing the same work, but the image toward consumers is different, therefore university is useful. Qualification mark can also be the income for university too.

### **3.4.3 Experience from NTU Food Safety Center**

Prof. Hsu was the head of Food Safety center in NTU before, but it ended up in 2015. Food Safety center was operating the similar content which proposed by this research, it held the training course instead of consulting service and act as the third party for certification. There were several reasons behind the failure. Mainly was without the support from NTU, since there was no funding from government and university Prof. Hsu can only use the budget from his own project. University can not compete against other third parties, the certification has to go step by step, also there was no flexibility in price. Food Safety center in NTU fail, nevertheless, with the know-how and experience in operating, Prof. Hsu became the key person of Food Safety in Taiwan.

NTU Agricultural Planning and Development Research Center carried on the task of Food Safety Center from the different direction. Therefore, the key that the mechanism can exist or not, highly related to the support from the school, which means has to give out enough motivation. The relation with government is important too since the government takes part in the system, it greatly enhances the impact.

### **3.4.4 University as PGS Platform**

Prof. Hsu suggested the core idea of this research: Let the university become the platform of the Participatory Guarantee System. Currently, there is no Food Safety Management System that can ensure 100% guarantee of the safety. Everyday site check by an auditor is impossible. Therefore, in order to achieve a system capable of self-management, companies nowadays prefer system certification rather than single product certification. This is the advantage of PGS, it highly focuses on the entire system, and make sure the participators reach a consensus. In addition, encourage the consumers the join and get involved in

the production. Although the accuracy is not good as the certification, still help the Food Safety environment. Further, with the function of consulting, it can raise the knowledge and ability in self-management. PGS is not admitted by the government in Taiwan yet, but with the lower cost and additional assistance mechanism, it is suitable for small-scale production and this research. Currently, the main problem in Taiwan PGS environment is less knowledge with insufficient management. PGS needs a standard to manage, incorporate with the E-platform release the information toward the audience and create the transparent interaction. Besides, compare to certification, PGS can simplify the standard, therefore the shortage of auditor is solved. University can let students become auditors, although it might accompany the issue of student traffic safety and students are allowed to make the mistake, consumers still like and trust students within the atmosphere in Taiwan.

### **3.5. First Evaluation, Stakeholders Interview**

In general, the structure of the interview was similar for all stakeholders but separated with different question content. They were asked one set of questions from different angles, before and after the explanation of the concept. The general questions were used to collect information from each stakeholder focusing on their effort towards increasing the consumer trust and attitude towards the current system. The structure gave the interviewer degree of freedom and flexibility on question sequence to explore and also gain the additional feedback on the interview. This approach was used for the author to deeply investigate and evoke insightful information about the topic.

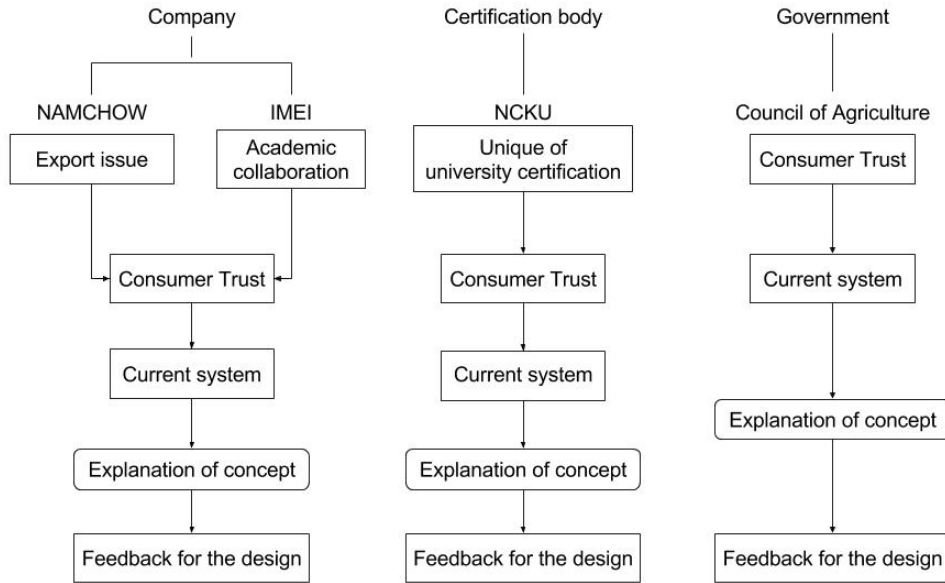


Figure 3.3: The stakeholder interview structure.

### 3.5.1 Company Interview, IMEI, and NAMCHOW

Food Safety is a sensitive issue within the food industry, most companies are not willing to talk about it due to the issue is highly concerned by the society. Under the atmosphere now in Taiwan, any single part goes wrong, will cause a severe problem to their market, not to mention a Food Safety research which will judge and evaluate the company. There are twenty-two companies on the exchange list of food category. This research selected six well-known objects from the list, five of them welcome the visiting initially, but after they received the interview outline, which focuses on Food Safety, they corrected themselves and refused the interview. After two weeks negotiation and waiting, the only company received the interview is NANCHOW. According to the mail contact, they even set up a meeting to discuss whether to accept the interview or not. It showed the sensitive level of Food Safety issue in Taiwan, especially the company on exchange list, has to be very careful in making any inappropriate answer. Over half of NANCHOW's profit is not from Taiwan, which has the largest overseas trading

volume within the food industry. It is the most appropriate target to evaluate the 'International standard' concept. The interviewee is the head of international trading, Mrs. Huang.

IMEI is ranked as the best food company in Taiwan, which holds the most consumer trust. They had accumulated lots of experience in how to create the consumer trust which was the main point of this research. In terms of the capital and profit, IMEI is recognized as the big company, which is not the public trade company and according to the management family, it will never be on the list. Before Food Safety issue broke out continually, IMEI was the old company own its own store in nearly every city in Taiwan which rarely had media exposure. After most of the big food companies had experienced a Food Safety issue, consumers found out that IMEI did not have any problem. The slogan of "IMEI is the only conscientious food company" came out. Products in IMEI store were out of stock frequently. The interviewee is the head of public service, the spokesman of IMEI, Mr. Choa. Within the interview, 'Academic collaboration', 'International trade' and 'Way to increase consumer trust' are conducted before the first test.

### **Academic Collaboration and International Trade**

IMEI has lots of academic collaboration mainly focuses on the internship in selling part, students from Food and Beverage, Management, and Marketing join IMEI store. The advantage in academic collaboration is to train the future staff, if they wish to join IMEI after graduate, they can go directly to the site without additional training. Mr. Chao mentioned that there is nearly no disadvantage in academic collaboration, nevertheless, it does not really relate to consumer trust, this kind of information would not release to the public. Even the development collaboration will not be highlighted within the marketing. Further, purchasing department might be the most concerned for society, but this is part of the business secret which does not open to the external partners.

NANCHOW is not working on an academic collaboration, only stays in interaction. The reason is most of their products and market strategies are B to B. Mostly they go through trade company for international trading, which is more efficient and guaranteed. NANCHOW will attend the food exhibition within the world by themselves to open the market. The target users of NANCHOW mostly

have their demand in advance, they care about lower price or better quality, therefore promotion is not needed.

The tariffs are the main issue now in international trade, take Thailand for instance, Taiwan pays 20 to 30 percent, but China pays 1.5 percent. In addition, there is a problem with religion, consumers request for Halal certification in South-east Asia, which is nearly impossible for the Taiwanese company. The other issues are about permission, such as 'Import permit' in the US due to the FSMA, and also some documents and inspection are needed from Taiwan government. The weird things are Taiwan government is more strict toward export than the domestic market.

### **Key for Consumer Trust**

IMEI believes in self-management. They have a laboratory which is approved by TAF. All the materials used in IMEI go through three steps. The certification of certain material, inspection within IMEI lab and observing reports by companies which purchase their product. Irregularly, IMEI will self-check all the production lines and go around the world to look for better material. One of the remarkable results is in the past, McDonald's banned the suppliers from speaking McDonald's is using their product, but nowadays, in contrast, McDonald's claimed that they using IMEI bread and milk to try to increase the consumer trust after the Food Safety issue widely spread. IMEI also holds the factory tour monthly, the author attended in August 2017, it started from history introduction and went on site of production process step by step. In the end, there was a discussion session to communicate with consumers. Begin with Storytelling, show them the quality maintenance, and communication with an open mind. After the tour, the survey toward participators found out the tour process was efficient in increasing the consumer trust.

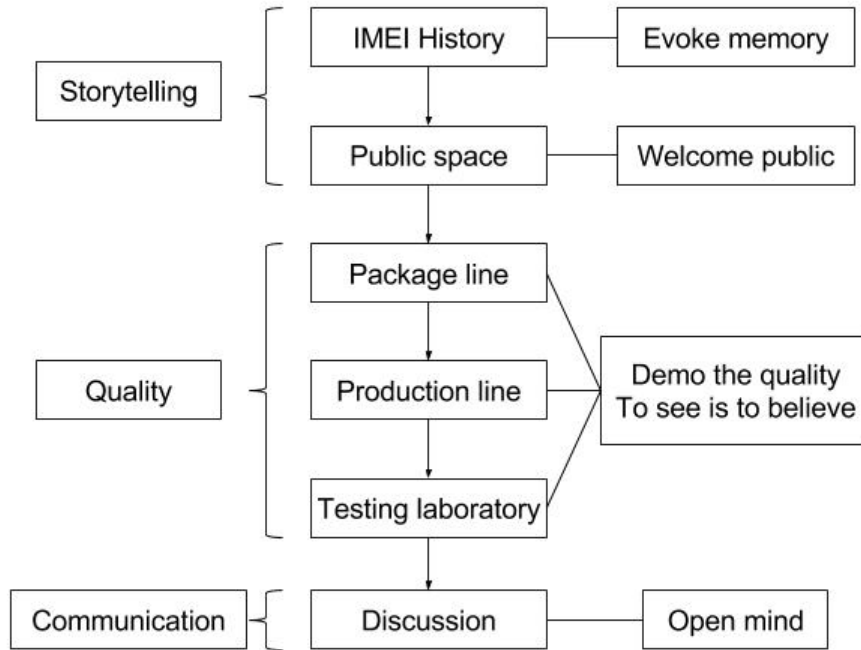


Figure 3.4: The flow and description of IMEI factory tour.

To make the food industry chain better, Mr. Chao considered not only IMEI but all the companies should precisely select their trading partner, to ensure the quality and safety. In 2013, 'Expired ingredient puffs incident' happened to IMEI, but unlike other companies, consumers still had the confidence in IMEI after the incident. Instead of giving some excuse, IMEI admitted the problem and apologized at the very beginning. After that, they clarified the reason and released the information to the public.

NANCHOW once happened the Food Safety issue, they stopped the delivery in the first moment, and ask for the inspection from the government, after clarified it is a complete mistake they released the information to consumers, and the issue is solved. They considered the best way toward Consumer trust is honesty and transparency. They set up a Food Safety office to review all materials before purchasing, confirm supplier inspection reports, and production hygiene. In addition to the food security office, the factory has self-management of raw materials,

packaging materials, COA factory management. The Food Safety office does not have its own lab, it outsources the inspection instead. Through the search, the author found out although NANCHOW does have the Food Safety office, it is not known to consumers.

### **Attitude toward Current System**

Currently, only one production line in NANCHOW applied for CAS, and none of the production lines was under TQF. They prefer international certifications such as FSC2200 and ISO22000 that apply to the international standard for export and import. From the company's perspective, the main problem in current certification and legislation is government change from one to another, the policy from the different department is inconsistency. In addition, the government put emphasis on the big company, but in fact, as the statistic data showed, the subject which should be strictly controlled in Food Safety is a small-scale business. A big company has to take higher risk than others when an incident happens, however, with less knowledge in management and lower risk to take, large numbers of small-scale business, therefore, cause the serious problem in Food Safety. IMEI did not believe in current Food Safety Management System, and even gave up the channel which required certification. Instead, they tended to get the international certification such as ISO22000 which is more complicated but reliable and connects to the world.

### **Feedback for the Design**

A system designed based on consumers is the main point, which is where IMEI's efforts are focused on. With such a system, IMEI hopes for closer and increased communication with the consumers. Since consumers know more about the system, it increases their identity. Academic certification will raise the consumer trust but from company's experience, there are some problems. Firstly, in comparison with the company, the way academic institute working has less efficiency. The college will be limited by budget and project, the way they deal with the budget is more conservative than the company. The company owns the cutting-edge machine for testing and the operation of the company is flexible to

purchase the new facility in need of any time. Another point is they have to pass the accreditation from Taiwan accreditation foundation, which is extremely difficult.

The certification has to be under the supervision of Council of Agriculture or Food and Drug Administration which is inappropriate for the university. The concept of 'International Standard' might not work, first of all, the big company would not need this kind of service, secondly, for small-scale business can go through 'Taiwan External Trade Development Council' or any institute in the target country they trust. The potential market generated from the university is too small, also university might not able to operate the complicated export process. Mr. Huang suggested that concept of 'International Standard' can be modified toward building the academic certification all over the world and connect them, which might make the big effort to small-scale production. To sum up, there is still some problem with the concepts, but this system can manage the small-scale business properly, due to the university is everywhere in Taiwan.

### **3.5.2 Certification Body Interview, NCKU**

Interviewee Dr. Wen is the director of Research and certification center of advanced Green Industrial Technology in National Chen Kung University. Within the interview, firstly, he was asked about consumer trust and attitude toward the current system, and the unique of university certification, eventually the feedback to the design of this research.

#### **Unique of university certification**

The certification in NCKU will plan the future marketing with farmers, from what to grow, how to storage, to who to sell. The motivation to apply for certification will be discussed as well as skills and funds. One of the example was Dr. Wen introduced a farmer to the farm for an internship, learned everything again from the beginning. University gets involved in Food Safety can achieve the greatest of its value. More industry collaboration, volunteer service toward society and create an opportunity for students to apply the research to the reality. Although there is no pressure to accomplish the sales goal, which increases the consumer



trust, without financial support from the school, mostly, Dr. Wen used his own budget from the project. It is frustrating when a professor is responsible for all profits and losses. Dr. Wen is now working on technology transfer to establish the external company which has the contract and keeps the relationship with NCKU. It can take care of both advantage of university and less support from the school.

### **Consumer Trust and Current System**

Dr. Wen mentioned that government is still uncertain in how to promote and implement food quality and safety, however, Taiwan is small, any contamination will easily cause the mutual influence. Through the experience in communication with producers and consumers, he has the own opinion of consumer trust.

- People tend to hold the suspicious attitude at the very beginning, but if they give the try to support the good product, the whole area will become better, then the consumer trust will stay stable.
- A user-friendly website for consumers to release the result and information.
- Consumers need to understand the Food Safety comprehensively, it is not only about the certificate, but also the sustainability, bio-system and so on.
- The best way to build the consumer trust is to bring them to the field, get involved in the production. Let the Food Safety become part of their life-cycle.

Dr. Wen pointed out the certification is not friendly to small-scale production, it is too complicated for an individual producer to join, which needs the group production with a staff who mainly take care of the certification affairs. Besides, the regulation mentions certification body is not allowed to do the consulting is strange, within this part, the university has the advantage, such as the open lecture or gives the manual. The role of TAF and Council of Agriculture is in conflict. TAF is the only legal accreditation body in Taiwan, but within TAP certification, it becomes Council of Agriculture accept the result from TAF and give accreditation to the certification body. In addition, there is a monopoly in CAS and TQF, it does not open to non-selected organizations, there are even no regulation mentions about how to join.

Due to the regulations require company go through certification, in order to offer the food to campus restaurant and military. It led to the result that company applies for certification for marketing purpose rather than produces a good product.

### **Feedback for the Design**

For Dr. Wen, university is the educational-orient place, therefore the system which includes promotion or export part should extremely careful about the profit-related action. The advantage of the university is non-profit, and it should be maintained. As the experience from him, college sales the technology more than product, therefore, processing food is better than fresh product, also the storage life is longer which is good for demo and exhibit. About the regular market on campus, which is the nice and reasonable idea but the experience from Dr. Wen is that difficulty is how much support will get from the university. If the directors and senior officials do not consider the market as school level importance than the process of applying for space to submit the event report will be extremely troublesome. In addition, the host should carefully avoid the scandal from earning money. Besides, if the space of food market event is outside the campus, such as the park, it will be necessary to collaborate with the government. Otherwise, follow the regulation in Taiwan is difficult to operate continually. About the oversea promotion, Dr. Wen have the experience is to put some product as a demo in Xiamen University, China, but only once. 'Government Supervision' is the good design but better to notice two points. Firstly, policy in Taiwan normally follows developed countries such as EU or Japan, but as Dr. Wen knows, still none of them apply this kind of system, without any precedent, government officials in Taiwan might not able to take the responsibility. From a different angle, take organic in a foreign country, for example, the environmental influence and risk for the small field is higher, so they are given the different organic mark, which is easier to get. Organic processing food in the US also divided into different levels base on how many percentages of organic ingredients they used. In Taiwan, organic transfer period mark can regard as ranking too. Government Supervision is possible to give out the different ranking result.

According to Dr. Wen, the idea of the neutral institute is again proved, but

the nonprofit characteristic is also the point to be careful. People trust the neutral institute such as the university, meanwhile, they set high demands on it. Every action relates to profit will be scrutinized by the public. Dr. Wen highly recommended to build a startup from the incubator campus and keeps the relationship with the university through the contract. The company in charge of certification and university address the promotion and consultancy. The division of the work keeps the non-profit characteristic and flexibility of operation.

### **3.5.3 Government Interview, Council of Agriculture**

Council of Agriculture, as well as Food and Drug Administration, are two of departments in government which supervise the Food Safety issue. The difference is that Food and Drug Administration provides the scientific data and evidence toward Food Safety, and they do not issue and manage any certificate. Council of Agriculture communicates with consumers and suppliers, and hold the certification which is more suitable as interview target for this research. The interviewee Mr. Wang is the head of TAP. The interview focused on consumer trust and the lack of current Food Safety Management System, conducted to the first test of and feedback toward the design.

### **Consumer Trust and Current System**

”Government is misinformed by consumer trust and attitude toward Food Safety, however, there is no trust problem for the producer.” Mr. Wang said. He harbored the idea that certification is to make sure the accuracy of the process for the purchaser. Third-party certification exists due to some purchasers need others to guarantee the Food Safety. ”When it comes to trust issue, I believe company trusts the certification, and that is also why they apply for it. But most of the consumers are ’Emotional trust’, which can be easily changed if any incident happens.” Mr. Wang considered consumer trust also change based on their knowledge level.

Certification is relative quality, not absolute quality. Certification mainly inspects whether the producer maintains quality well or not, nevertheless, as for the non-compliance, it is possible to fake the result. It can only be identified from the

potential factors through the audit process, but currently, due to the lack of inspection frequency and method, it is difficult to find out the potential risk. There is no mechanism on TAP to make sure if the company did the correct record. Producers must be in line with national norms, even if they do not apply for certification it is necessary to operate the good manufacturing practice. Of course, the industry can manage themselves, but with the external third party, there is an additional benefit which is experience sharing from an external perspective.

Certification is for the company rather than the consumer. The big company which is far from the customer and therefore requires more assurance mechanisms. A small-scale business which is trusted by consumers does not have to apply for certification, but if they wish, but facing the difficulty, it is government's responsibility to assist. Toward the consumers, there are too many labels on the market. The COA now is considering to integrate the label for Food Safety.

### **Feedback for the Design**

Mr. Wang considered that consumers should enforce their attitude to food more strictly. Consumers should not only claim that they want something more healthy or organic, instead, they have to understand more. Otherwise, consumers still can easily be deceived and can not distinguish between truth and falsehood, regardless of the effort government or this system does. Mr. Wang also mentioned that is good that the design focuses on consumers, but from scientific spirit and precision, the certification process has to stay credibility. The main is to check if the food is safe or not, therefore make sure the university has the ability such as professional staff or machine is extremely important. Besides, follow the regulation nowadays, certification body can not give any consulting service to companies or suppliers also can not sell any product. The interaction between applicant and university should be carefully addressed. To sum up, the university is not the only institute to implement certification, also open to another competitor, or university become the consulting body and collaborate with the existing certification body, might be the best way. The 'Government Supervision' from government's attitude is the good design. The purpose is similar to the future plan what COA is planning, however, currently, certification bodies have no interests. Therefore, COA is considering the label for different contents, for example, the food is not

only organic but also sustainable, animal welfare or halal. The new label for additional description can be to put beside the original one.

### 3.5.4 Short Summary

Through the interview, the author found out the following result. This system should focus on small-scale business while the big company will be in different situation. A big company such as IMEI and NAMCHOW had their own system, besides, they are under certification and government's supervision, theoretically, they are safer. According to the literature review, the system should be as simple and understandable as possible to increase the consumer trust. However, using the term 'Certification' will become more complicated and less flexibility. Consequently, 'Qualification' was proposed.

Besides, there is no strong relation between academic-industry collaboration and consumer trust. Also, the authority will become the company which makes the situation worse. According to international certification regulation, certification body can not do any promotion or consulting service, therefore, an independent PGS system operated by the neutral institution is the ideal model. Further, original idea is to put PGS element into certification, but the interview established that PGS as main, and university become the PGS manager can tackle the consumer trust issue better. Although the accuracy of PGS is lower than certification, it has the wider application that can be beneficial for the whole environment.

In addition, Dr. Wen mentioned the company originates from the university is an alternative solution, however, this needs more research and potentially will increase the stakeholders which might become too complicated. NCKU is working on it now, and still, in the experiment step, this strategy currently does not exist enough evidence about the influence to consumer trust.

The concept of 'International Standard' exists some problem. Not every company has demand for exporting, in addition, small-scale business has less demand within the case. On the other hand, the big company already had their own distribution channel. Additionally, if the university gets involved in the international promotion, it causes more profit-seeking behavior, which is the conflict of non-profit characteristic. The author found out that focusing on the deviation between Food Safety Management System and the consumer is the point. Instead

of applying 'International Standard', create more communication and generate interests toward Food Safety increase the consumer trust.

## 3.6. Concept: Academic Participatory Guarantee System

Academic Participatory Guarantee System(APGS) is a design based on PGS and set university as the operation platform, which tackles the issue of increasing consumer trust toward small-scale business. The system modifies the disadvantage of PGS which is too many participations for consumer and no supervision body. Through the fieldwork and stakeholder interview, the first design version is modified. APGS, the new concept which mainly addresses the consumer trust, is divided into: 'University Qualification', 'Consumer Friendliness' and 'Government Supervision'.

### 3.6.1 University Qualification

The following three shortcomings from current system will be discussed and addressed in this section.

- Too complicated which is not understandable for consumers.
- Difficult to apply for small-scale business.
- No communication and far away from consumers.

According to Prof. Hsu from NTU, the term: 'Certification' will relate to regulation with a complicated process, and further, certification makes consumer feels: '100 percent safe', but in fact within the complex society with human or environmental factors, there is no Food Safety Management System can guarantee 100 percent. A term between consulting and certification will be appropriated in this case, therefore, 'University Qualification' is named. Originally, PGS succeed due to the active consumers, this advantage is kept within APGS, but slightly modified. Within a certain distance, a local area is supervised, simultaneously,

university, company, and consumer are close to each other, which generates a social pressure. University has to operate the system properly, although lobbying might happen, the consumer is surrounded. Food Safety Management System is no longer a hidden existing. University is an obvious object, which can be accessed anytime when people pass by. Most of the time, people are not able to care about the Food Safety due to the distance, therefore, when production and management system are just single miles from them, likely, it will highly raise their concern. One of the main reason that current system can not well-managed the Food Safety is the check frequency, and in fact, consumers know about it. Due to the cost and lack of manpower, certification is not able to increase the frequency. With the term: Qualification, it does not have to be as precise as Certification and would not be limited by regulations. University is able to let students involved, it can be learning process of practical training, further, after they graduate, potentially able to solve the shortage of food inspection experts for the government. In addition, recently in Taiwan, students represent the justice which will increase the consumer trust. The expertise is lower than experts, but under the leading of professor, the quality will be monitored. Besides, the core of this design is for consumer trust, therefore to extend the participatory and gain the trust is more important.

## Organization

The name 'Food Safety center' can clearly describe the operation of 'University Qualification' which also take care the origin duties of the university: research and education. Through the literature review of current university role and interview, the level of Food Safety Center should be same as a college in the organization hierarchy. It will be independent of any department just like Stanford D-school. The reason is to keep the diversity and idea from the different area, and of course, it will receive the support from the relative department. To spread the knowledge of Food Safety, all the event, exchange and lecture welcome students from different backgrounds. All the formal communication, as well as certification mark, use the legal foundation name of the university. Under the idea of APGS, the author looked into the experience and operation from the relative system: Green-Product Certification Division National Cheng Kung University, Center for Agriculture and

Aquaculture Product Inspection and certification National Ping Tung University of science and technology, Agriculture Product Approval and Certification Center National Chung Hsing University as the reference. Eventually, design three unites under the Food Safety Center. Department of Qualification, Department of Testing and Administration.

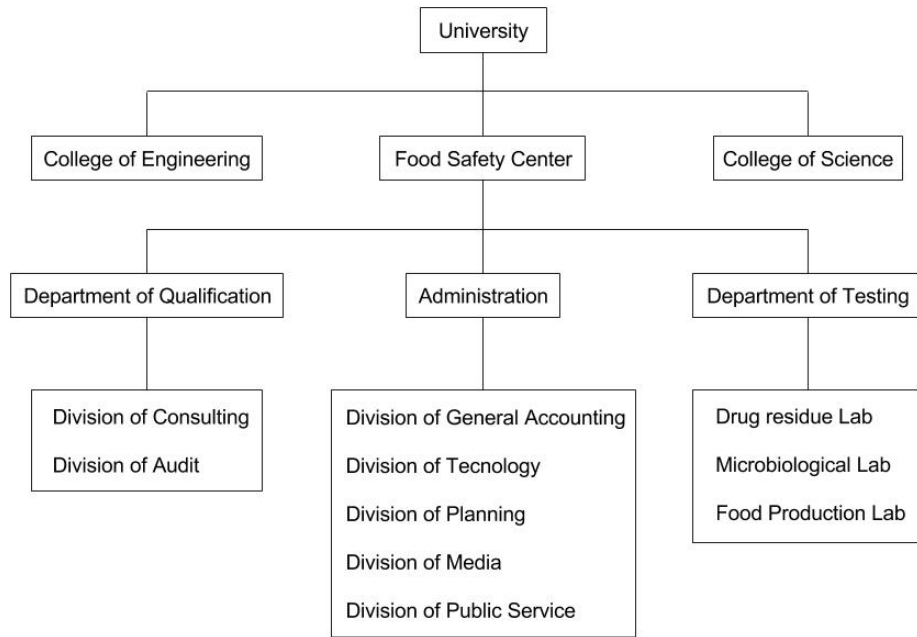


Figure 3.5: The organizational chart of APGS.

- Department of Qualification: There are two divisions in Department of Qualification. Division of consulting is the platform for knowledge sharing and training. Division of Audit in charge of hygiene check and make sure the company and supplier follow the standard and maintain the quality.
- Department of Testing: In order to make sure the food is safe there are three laboratories in this department. They hold the different expertise and facilities. Drug residue Lab, Microbiological Lab, and Food Production Lab According to the interview with Council of Agriculture, This can also be



the collaborative department, due to the regulation that certification body can not promote the product as well as give the assistance, certification business is outsourced to the company which born from the incubator in campus or external company which already working on the certification. The motivation for the company to join is the reduction of site cost and potential of increasing the revenue. It also reduces the university works and initial investment.

- Administration: There are five departments of administration. General accounting manages the financial relate affairs. Planning hold the local market and college store. Technology supports the network and data management. Media represents the center to release new and information. Service connects the local people to build the horizontality.

## System Flow

APGS system operation picks the advantages from the normal certification and PGS to keep both accuracy and flexibility for APGS system flow. The current certification only asked the company to pay and get the certificate, it sounds like pay to find someone to make a trouble. Though the interview with Dr. Wen, the author started to consider the system really help the company to increase the Food Safety and bring back the consumer trust. The system flow integrates the key elements and feature as well as the step from certification, create a mechanism to help the company rather than exam it. Take college entrance examination, for example, the current system is likely the examination center giving the test toward examinees, nevertheless, the APGS is like the cram school, which help all the students to get the good grade within the examination. The system flow goes through the discussion and pre-declared consequence to ensure the applicants understand the method and meet the compliance. Meanwhile, take off the frequent consumer participation and add in the Government Supervision which can be regarded as the examination center to evaluate the system.

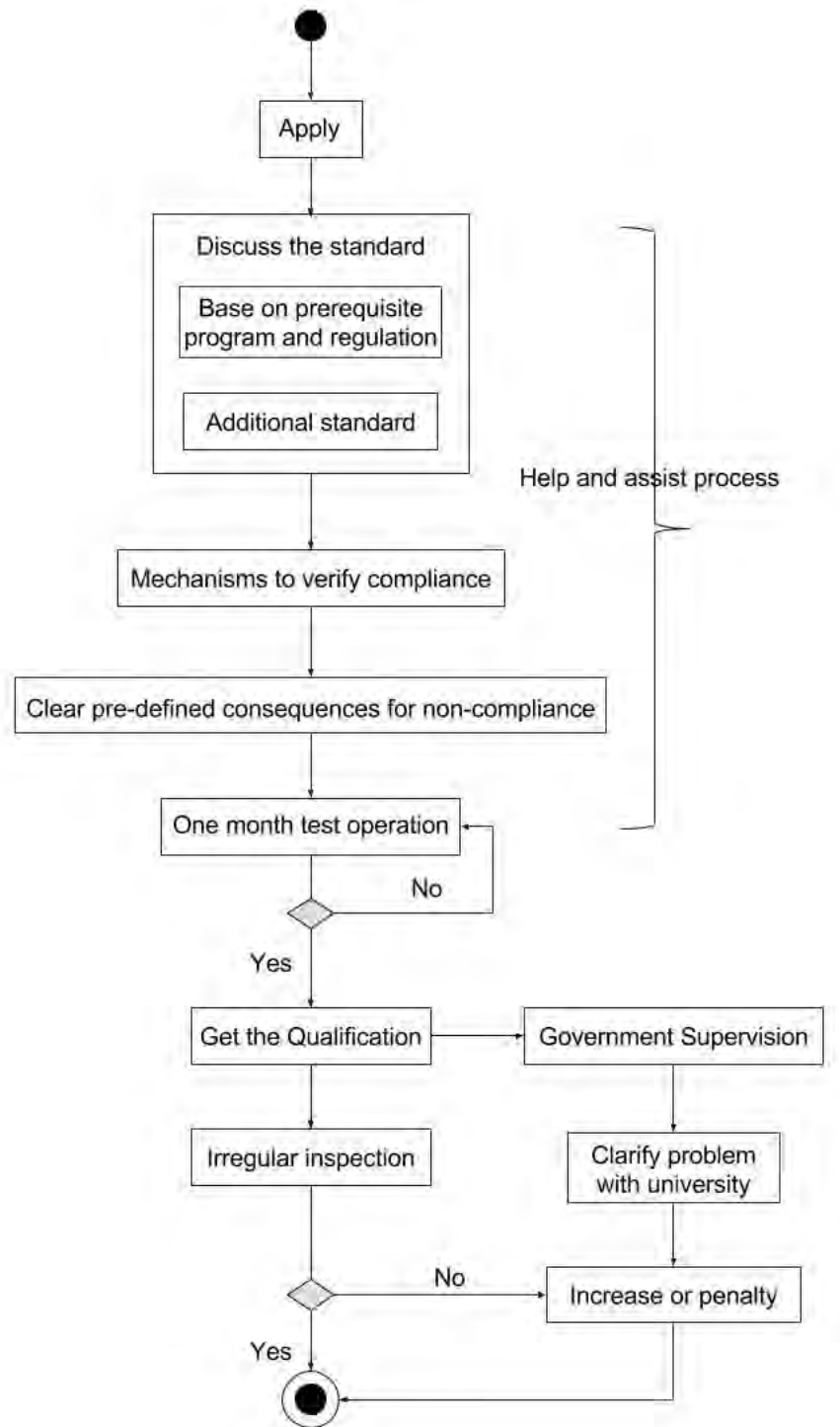


Figure 3.6: The system flow illustration.

### 3.6.2 Consumer Friendliness

Originally, Food Safety certification and legislation are launched by the company to manage and check their quality. However, the transformation of the social structure and awareness led to the different situation. Consumer trust toward the product highly influence the market, meanwhile, their concerns do supervise the company to keep the proper production. In the other word, the mechanism which is not trusted by the consumer will reduce the function. Through the literature review, the author found out that people trust the thing that accessible with transparency, in another word, the system needs 'Consumer Friendliness'. Therefore, to tackle the issue, there are three concepts included: 'Communication to build the participation', 'Storytelling to raise the interests' and 'Demo the ability to maintain the quality'.

#### Communication to Build the Participation

APGS is designed to be as close as possible to the consumer. Universities located in every city and county, they have the connection with local residents. People in Taiwan have lots of interaction with the university, they go for jogging or hire the students for a part-time job. On the other hand, the university has lots of interaction with local too, if the APGS come to real, it will generate the mutual monitoring. One of the roles for the university is education, it is not limited to students, some lecture or speech even open to the society. Close to the consumer and raise the awareness, which can also reduce the cheating with the slogan. This research sums up the previous data and proposes the interaction between consumer and APGS.

- Knowledge building: Regular lecture and speech
- Open mind to the society: Mailbox for residents, SNS feedback system
- Co-creating events: Let the consumers participate the in APGS and leverage their concern to let them get involved.

Communication benefits the university too. Students can have more opportunity to learn and work practically in the real world. More future experts in Food Safety will be trained and contribute to the society under the APGS.

## **Storytelling to Raise the Interests**

People are engaged by the story, it generates the interests, and further, let people take the initiative to understand the serious and complicated topic. Even the busy people will give the concern to something interesting. Stakeholders in APGS generate the stories, listed as follow.

- Consumer: APGS is opened to the public, people can access the office or participate the lectures as well as events. These processes generate the story.
- Company: With the frequent interaction included discussion, consulting and site check, there definitely will have some episodes happen.
- University: There are various of the department is in the university, it is the wellspring of creativity, simultaneously the story. The interdisciplinary environment can even find out some blind spots. All of above will create the wonderful and unique materials for storytelling, Food Safety becomes an interesting encountering within the daily life, eventually, build the consumer trust.

## **Demo the Ability to Maintain the Quality**

Food Safety center is in the campus, surrounded by residents, further, the checking and testing are happening just beside. It is able to demo the process and how AGPS maintain the quality toward consumers. Things in daily life make people believe. Thus, the system still has to well manage the Food Safety rather than just a marketing or promotion. There were lots of cases that the demo and production is a different quality. Nevertheless, if the quality demonstration is just beside the consumer, all the processes are happening while people are experiencing. University and company are forced to follow the compliance. APGS is able to successfully reach the consumer, demo the quality and keep the standard.

## **Touch Point for Consumers**

Through the interview and fieldwork, the author found out that label for certification or management system is the primary touch point for consumers to un-

derstand the management system. Without extra telling, people can only judge the FSMS from label, they will have the first glimpse from it to build the system understanding. Therefore, it helps the consumers to have communication with the system and also represent the whole system. Rather than logo, the label has to provide necessary information to consumers. There should be an information about which institute in charge of the APGS, and a direct way to get more information, as well as the product detail. In addition, to prevent from forgery, Which company or supplier is the applicant and the qualified product should be list on the label too.

### **3.6.3 Government Supervision**

The highlight of Government Supervision is the independent operation. Unlike the current system, there is no relationship or official interaction between government and APGS, in the other word, scheme owner and the auditor is entirely separated. Besides, instead of the discussed standard between APGS and applicants, the government uses the general standard to evaluate the system which also gives the external and different aspect of the system. According to the first test, the research proposed the idea of linkage and observation method for government supervision. Within the food chain, regarded as the linkage system which influences each other, therefore, check result should be reviewed as a system instead of pass or not. The data collecting base on observation rather than paperwork, government hold the objective data which enable to manage the potential risk. Besides, with the observation, it would not need to send the notice before the inspection, nor bother the company by increasing the frequency. The detail of government supervision included three processes in food cycle, 'In the field or farm', 'In the factory' and 'In the market'.

#### **In the Field or Farm**

'In the field or farm' part looks into cultivation process and it takes the TAP as a reference. The author went to ten different farms and fields in Taiwan for observation and found out no matter what kind of cultivation or poultry-farming, there definitely has environment to work, method to apply and interaction process

to buy and sale. For the detail of three elements, the research looks into the TAP, there is a 'Taiwan Good Agricultural Practices(TGAP)' regulation for TAP operation, it tells the farmers how to implement the good agriculture, meanwhile, it is the checking list of TAP too. The author picks those elements for 'In the field or farm' as observation subject and evaluation elements. In addition, within the TGAP there is also the different regulation between various of categories, therefore 'Others' on the list to record the additional data and information.

- Environment: Temperature, Moisture, Soil, and Pollution.
- Method: Cultivation, Fertilizer, and Pest control
- Interaction: Within the buy and sale interaction, trading partners, trading volume, and transportation.
- Others: Different factor within the different location or category.

### **In the Factory**

'In the factory' focuses on processing part, it takes ISO22000 and 4M as a reference. ISO 22000 is a worldwide standard of Food Safety, which admit by most of the countries in the world and used as the principle for food import and export. It is basically the combination of ISO9001 and HACCP, which means Quality Management system and Hazard Analysis and Critical Control Points. Standard specifies the requirements for a Food Safety Management System that combines the following generally recognized key elements to ensure Food Safety along the food chain, up to the point of final consumption: 'Interactive communication', 'System management', 'Prerequisite programmes', 'HACCP principles'.4M indicates the four indexes of quality management in processing, they are Man, Machine, Material, and Method. 4M is also the prerequisite program of TQF. In the merge of ISO22000, machine is replaced by 'Environment' which include the 'Hygiene'. The material is one of the objects in 'Interaction', therefore the term 'Interaction' is adopted in this case. 'Others' is on the list due to the difference of factories.

- Man: Interactive communication

- Environment: System management Machine and Hygiene
- Interaction: The element and flow of inventory and delivery, such as material, package, storage, and transportation. HACCP principles are considered in this part.
- Method: Prerequisite programmes
- Others

### **In the Market**

Currently, Food Safety Management Systems do not consist of the market part. Due to the cultural background of EU and US, they focused on food science and accuracy of management. The process after the factory is not included. In Europe, the company will ask for the certification if suppliers wish to sell the product in their supermarket, on the other hand, certification in the US is mandatory. Therefore, the certification stops when the product leaves the suppliers. Originally Food Safety Management System is to check the safety of food before it hit the store shelves, rather than consumer trust or potential risk management. Through the interview and fieldwork, the research found out that things happening in the market will affect the whole system, for example, several cases happened was about the company recycle the expire product and remark the date. Therefore, how the company deals with the expired product is the important issue. Within this checking process, including all shopping cycle from the market receives the products to consumer leaves the store. The author selected three elements and others within the interaction cycle of the supermarket.

- Environment: Storage temperature, hygiene
- Interaction: Trade partners, transportation
- Sales status: Sales volume, expire disposal, customers satisfaction degree, target consumer
- Others

# Chapter 4

## Evaluation

Research and testing of the Academic Participatory Guarantee System was completed with participants from Taiwan during the 2017 October to December period. The core group of participants was made up of seven consumers who were interviewed, and taught of the whole system operation. The results of the implementation and consumer interview are covered in the evaluation chapter.

### 4.1. Methodology

This research applied in-depth and semi-structured interview, a methodology of qualitative research. It follows an independent interaction that goes through the oral communication between interviewer and interviewee, achieve the idea exchange and building of knowledge. The interviewer will analyze interviewee's motivation, belief, attitude, method, and perception during the interview. Against from giving out questionnaires, an in-depth interview can lead interviewees into the core and describe the current condition to bring out the answer and point. The research did not talk about the detail, instead, listen to the reason behind the simple answer from the interviewee. This pre-study before going to the explanation of the system is used to understand consumer intention and conducted to the future work. The process of evaluation for normal consumer applied the relation diagram and qualification logo to describe the story. Consumers have the characteristic of no time and knowledge for too much information, therefore, in order to imitate the reality, the evaluation did not go into the detail and make too



much explanation. To gain the neutral opinion and evaluation, the author avoided the close friend, instead, asked the friends to introduce someone else indirectly. Besides, to make sure the representation of the research result, people who have the concern in Food Safety but not from the exact background was selected.

## Interviewees

This research picked seven people who mainly live in Taiwan and not from the relative background of Food Safety such as Agriculture, Horticulture and Food Science. However, they need to have the basic understanding of current Food Safety Management System in Taiwan. A total of seven representative consumers were tested over a period of one month. The interviewees are categorized into three groups.

- Professional User: People working in the relative area with more experience and knowledge than others. A Michelin Chef and Organic product company owner were chosen. They are not from Food Safety relative background but have deep concerned about the issue.
- Frequent User: People not working in the relative area but with frequent interaction with Food Safety issues they will search for more information. The author selected Taiwanese, Japanese and Vietnam housewife who lived in Taiwan for more than five years to integrate the diverse perspective from the different cultural background.
- Casual User: People not working in the relative area and usually eat out. An engineer and designer were selected. They have basic ideas about the current system, and knew there is a problem, but have no time to understand more, which represent the most consumers' situation.

## 4.2. Implementation

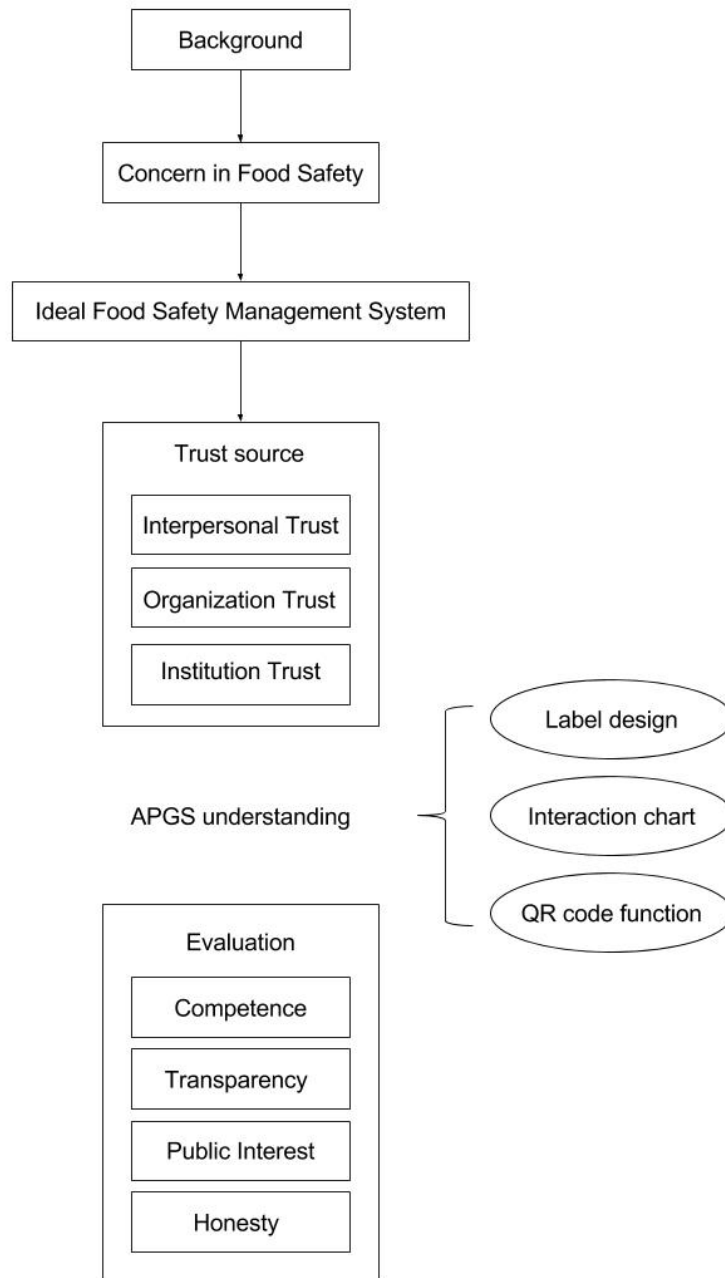


Figure 4.1: The step for evaluation.

In order to have the comprehensive understanding of the consumer and simulate the real situation, the interview process divided into three. Relaxing make one' s speak more and has the confidence to tell the truth, therefore, users are asked to talk about background which is the easiest question at the beginning.

Next, they will be asked the opinion toward Food Safety. Through the answers, the author would able to pull out the hidden point of consumer trust.

- Which part of Food Safety do you concern?
- What do you think the best Food Safety Management System is or what kind of system will you trust?
- Base on three kinds of trust source: Interpersonal trust, Organization trust, Institution trust, what do you believe within the current system?

The last part is the evaluation. The interviewees are encouraged to ask the question and give the feedback based on four indexes of consumer trust: Competence, Transparency, Public interest, and Honesty. In order to simulate the real purchasing and interaction scenario, three implementation materials are used in the evaluation. Each of them represent the part of concept, but should be regarded as the linkage relation.

<b>Concept</b>	<b>Evaluation</b>
University Qualification	APGS interaction chart
Consumer Friendliness	Label layout design
Government Supervision	Products information

Table 4.1: The correspondent of implementation material to concept.

- Label is the direct icon for consumers to build their understanding of the system. This research designed a layout of qualification label which provides a useful information to consumers. Unlike the TAP has to reprint for every production batch, this label design can be printed a large number once a time which reduces the cost for applicants. The QR code is product-based, the consumer can scan and know whether the qualification of the product

is valid or not and other description. The same information can be got by typing the valid code in Food Safety Center website.

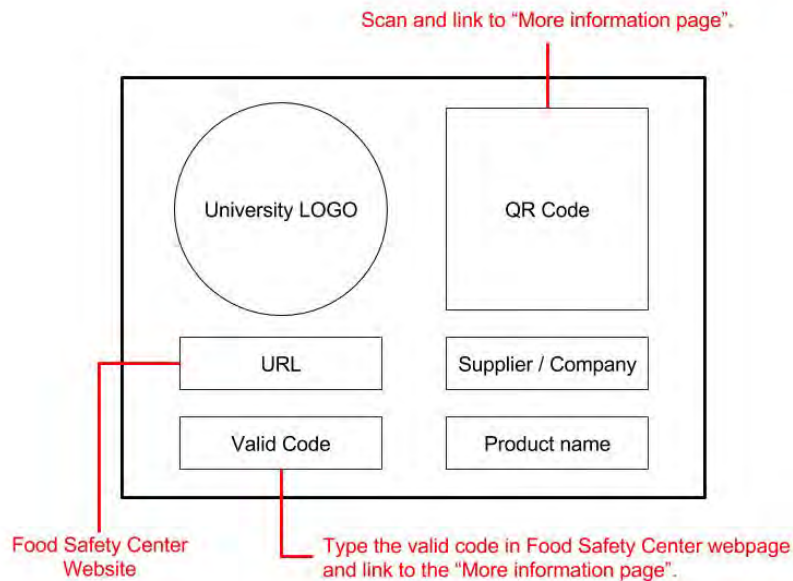


Figure 4.2: The label layout design.



Figure 4.3: The label which used in user interview.

- After consumers scan the QR code or type in the valid code in Food Safety Center Website, they will link to the website of product information. This shows the quality and results of APGS directly to consumers.

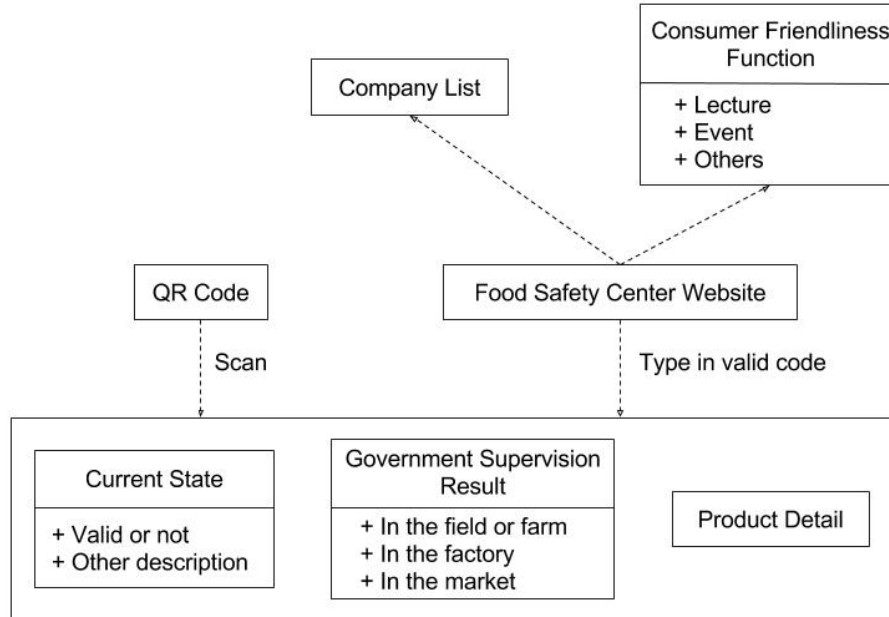


Figure 4.4: Contents of product information.

- The general system interaction chart is used for explanation of APGS and shown after the logo. It extracts the necessary idea of APGS for consumer to understand rather than entire description. Consumers are encourage to ask question after they read this chart.

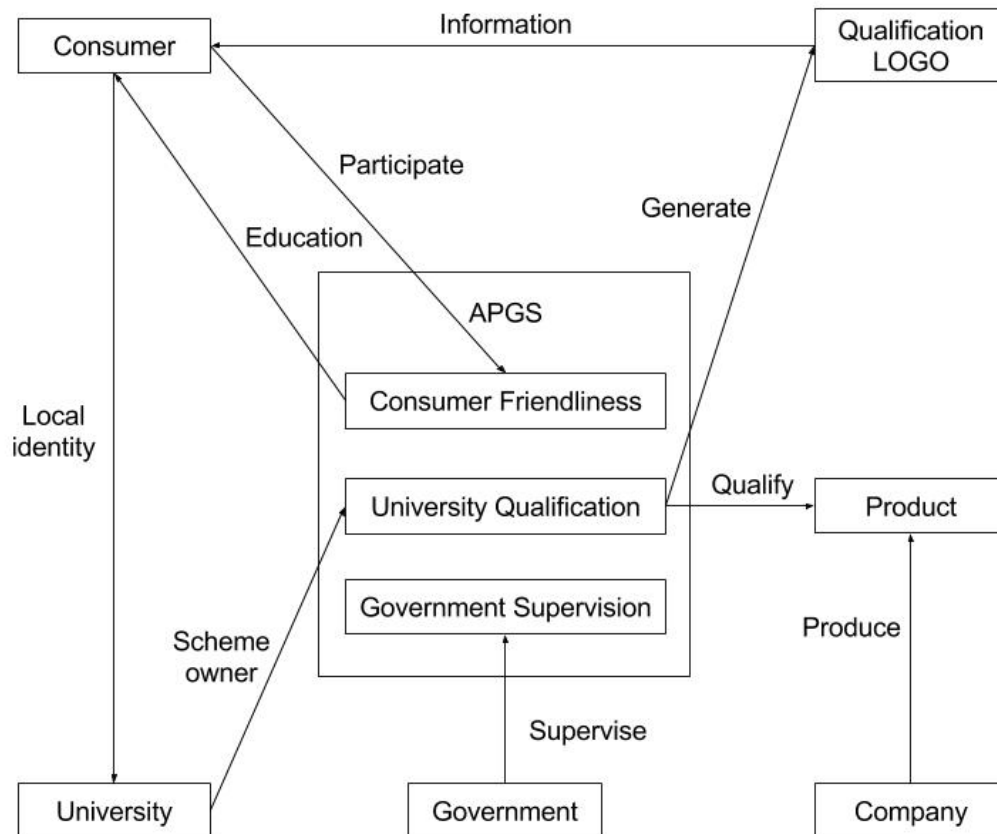


Figure 4.5: The APGS interaction chart.

### 4.3. Consumer Concern and Trust

According to the interviews, all users had no confidence in any institution. Although PGS is mentioned, it only represented that they believe in a product with a transparent production process. Thus, the necessity of new institution or system is justified.

Users considered people have to spend the time to understand the food, no matter what kinds of system are only the reference. One of the users mentioned that there is no best system, for example, nearly every food company in Taiwan will recycle the expired products and reuse in another product, however, this is not prohibited in any certification. There is always a blind point within the system. Within the organization trust, both professional users mentioned that the best organization should include multiple experts, stakeholders, and consumers. People trust small-scale production more, but these are the lack of managed which is the big problem in Taiwan. None of the users mentioned the government within organization trust, but all of them trust friends or family, which means people trust closer and under-control object. Therefore, APGS builds a community by managing the Food Safety tackle the issue. Users have various of reason about concern within Food Safety, the common point is they are not satisfied with the current situation.

	Concern within Food Safety	Reason	Interpersonal trust	Organization trust	Institution trust
<b>Professional User</b>	1.Ingredient source 2.Animal welfare 3.Additive 4.Beverage	1.Occupational concern 2.Environmental concern	1.Experts 2.Friends	Small production	1.PGS 2.No
<b>Frequent User</b>	1.Pesticide residues 2.Ingredient source	1.Raising the children 2.Job experience	People work in field	Authoritative organization	No
<b>Casual User</b>	1.Beverage 2.Organic product	Preference	1.Farmers 2.Friends 3.Family	1.IMEI 2.Organic company 3.Japanese product	1.PGS 2.Organic

Table 4.2: The result of concern within Food Safety and trust source.

## 4.4. Professional User

Both interviewees are around 40 years' old which working in the relative area but not from an exact background of Food Safety. Alan is a chef who used to work for Michelin restaurant in New York for over 10 years. Now he is back to Taiwan for own business. He will go to the origins to find the good ingredients and understand the growing environment. Besides, he advocates the Animal Welfare, let animals live happier, they taste better. Compare to America, Taiwan has better animal welfare but still less in management skill. Mr. Huang is an organic product company owner. With the background in Environmental management and administration. He spent more than half of his life in environment-related NGO such as Chinese Wild Bird Federation and The Society of Wilderness. From the perspective of ecology, he has the concern in Food Safety.

The research found out that both two professional users have no confidence in the Food Safety in Taiwan now as well as the current system. "The cogitation from the source to the consumer is either slightly wrong or totally wrong. It is the unhealthy food chain which causes the vicious cycle." Alan mentioned that people working in every part look to be phoning it in. There are the process and policy but they would not work if people brush it off. The consumer needs to have more knowledge. In addition, he considered all of the certifications nowadays are only for reference, the consumer has to judge by themselves. Mr. Huang does not believe the current certification. In his experience, there are too many Logos which cause the confusing. Mr. Huang mentioned that there was an environmentally friendly logo promoted by the government which is really good but soon disappear after the Personnel Change. No matter current system or policy, it is too complicated and uncertain which is also the main reason government lost the credibility. Interpersonal interaction is more trustable than the system.

Mr. Huang mentioned that there are lots of problem within Food Safety relates to the environment, for example, lots of products claim they are non-toxic, which means there are lots of toxic around. He has the most concern in chemical or illegal additive, which might harm our health. "There is an old saying within the bird federation: Today bird, tomorrow human, we go bird watching and found out they are in the serves situation which is kind of predicting our future." Mr. Huang said. His philosophy toward Food Safety is less additive and unnatural



production. Aside from Alan, his concern toward Food Safety is more about the environment, which provide the different aspect of this research: Better Ecology and environment, simultaneously, better food.

## Best System

The research found out that when it comes to the best system, the professional user has no confidence in any certification, rather, they only trust their friends' recommendations or small-scale productions. As the reason, they feel that, when a company grows up, such problems will occur, however, they admit that small-scale production too potentially has less knowledge in Food Safety.

The best Food Safety Management System for Mr.Huang is more likely the PGS way, in other words, to participate or understand how the product is produced. Alan gave the fundamental solution toward Food Safety which is the agriculture education begin from elementary school. Consumer knowledge of Food Safety is extremely important, therefore, the value should be built from childhood. Both Professional users consider 'I do not have time.' is not an excuse to avoid the knowledge building toward Food Safety. Alan had been to the organic farm and participate in the production, this kind of PGS method is the lack in the society, people should put more concern in what they are eating. Compare to foreign country Taiwan is small, which is the convenience for consumers to go to the origin, even in Taipei, there are lots of farm and factory around. The agriculture education can build the better-consuming habitat, since consumers willing to pay the higher price for better food, the whole food chain will provide better food. Alan hoped there can be a system like Michelin ranking. It is an annual evaluation base on consistent and continued inspection. This can give the consumer a standard or principle to choose the food, further, provide the job opportunity to the society. One of the main problems within current certification is the frequency of checking, if there is a Michelin ranking, lots of mystery person will be hired to make sure the company operates the proper production. Just like Michelin, more information within the production will be released to the consumer, create a transparency.

## Evaluation

Both professional users considered APGS is a good aspect and way to manage the Food Safety. They believe the university can highly raise the consumer trust. University holds the right toward knowledge, therefore, should definitely be involved in the Food Safety. With the continued interaction through APGS, getting closer to the society, the university can also realize an experiment and the academic research. Further, a local scale Food Safety Management System is able to build a deeper concern and get involved in Food Safety for local residents, such as an agricultural education.

The result of four indexes for consumer trust is shown as follows:

- **Competence:** Competence of APGS is sufficient. It will be even better with four years' training course led by professors, which can go deeper into the society and raise the consumer trust yearly.
- **Transparency:** It depends on how university releases the information to consumers. Beside QR code, a series of constantly updated and professional reports such as publish or thesis which evaluated by academic and public can increase the transparency.
- **Public Interests:** APGS creates a mutual supervising within the local area, non-compliance will be isolated which is better than certification. Take Pinglin elementary school in New Taipei city, for instance, the agricultural activity connected the local area, people trust school more than the government. In the other hand, school stays for the public interest, and educate the residents. Further not only consumers, suppliers trust school which enable the APGS to manage the Food Safety.
- **Honesty:** Professional users believe the honesty of APGS, but public school is better than private. In addition, honesty is hard to measure, human emotion potentially influences the honesty which is the point to be careful. More scientific evidence proves the better honesty.

The analysis of the professional users' feedback divided into two parts. A multiple participation: A mono-authorizing might happen lobbying or scandal,

and sometimes, the blind point. To ensure the Food Safety Center in university is not control by single department or person is important. Besides, private school has the higher potential to occur the lobbying or injustice.

Authority: Government supervision is a nice design, but the university should not rely on the government checking, they should take the responsibility or receive the penalty when an incident happens. Besides, Council of Agriculture and Ministry of Education might need to collaborate for APGS operation.

## 4.5. Frequent User

Mainly, housewives are identified as the frequent users, who cook and purchase the ingredients nearly every day for the family. In order to gain the diverse opinion the research select housewives from the different country but live in Taiwan for a long time. Their age is around 35 to 40, and have children. Two of them are from foreign language background and working as the interpretation for the government. The other is from the industrial design background and works for the food industry, she is considered between the professional user and frequent user. The name of interviewees is classified base in their countries, user T for Taiwan, user J for Japan and user v for Vietnam. Frequent users have the concern in Food Safety, due to they buy the ingredients and cook every day. Compares to others who usually eat outside, they have more sense but less in knowledge. They are looking for more opportunity to learn about Food Safety, they consider it should be embedded in education, and build the correct concept. User T mentioned in her company, the manager will ask staffs to recycle the expire product, remake and sale it again. Sometimes their refrigerating system crash, the manager does not care about that temperature will make food spoilt. The company even manipulate the TAP and label information. User V said in Vietnam farmer will have two fields, one for products to sell, the other for the family to consume. The wrong or illegal production in Vietnam cause lots of food illness. All cases above are related to value, ethics in Food Safety and production should be educated within the education.

The best system for frequent users is small-holder farming and products direct delivery from production area or farmers. User T mentioned that clear inspection

report is needed, however, most of the cases it doesn't relate to the final product, therefore, a system which can increase checking frequency is very important. User J mentioned that Japanese trust their own product but it somehow relates to media manipulation. In fact, the system in Japan is strict to foreign products but loose to internal products.

## Evaluation

The evaluation of the frequent users embraced a positive outcome. Currently, the government can only manage food companies that already have inspection procedures in place but, have no immediate access to the data of the production. Therefore, a local-focused system is able to manage the Food Safety and increase the consumer trust. Especially the small-scale company, it has higher potential risk than the big company, and even no quality manager, staffs follow the instruction from the boss. Besides, the government has lots of relative conference or lecture open to the society but participants mostly are from the big company. University is able to release the information widely and deeply, and attracts people to join, due to the local connection. Further, University Qualification has to be active rather than wait for the company to join. APGS is expected to reach the restaurant hygiene management and give the right knowledge toward the producers.

The result of four indexes for consumer trust is shown as follows:

- **Competence:** University holds the expertise and facilities which represent the competence. Besides, objective and neutral are convincing toward the consumer.
- **Transparency:** University is more reliable than others within the transparency. University is the local information exchange platform which will release the whole process to the public. In addition, the lecture for consumers not only increase the knowledge but due to the ability to judgment, transparency, such as pesticide is not always bad, with proper use, it helps to prevent the disaster, but this kind of information is not known by the most of the consumers, which is the point for the university to work on.

- Public interests: Frequent users believe university would not approve the let the iffy product. Besides, the university is neither company nor supplier, with non-profit characteristic, they are also the consumer, therefore APGS will stand for public interests. One thing to be careful is the connection with conglomerate, if the university receives the funding, it might have an effect on their neutral position.
- Honesty: APGS will release the information with honesty. However, from company sides, they will only give out the good news, how APGS negotiate with the company and publish both positive and negative to the public has to be considered.

The analysis of the frequent users' feedback divided into two parts.

- Communication path: There are lots of gaps between consumer and Food Safety Management System, and the concept of 'Consumer Friendliness' is able to make the compensation for it. Frequent user especially looking for the user-friendly communication network for people who can not participate in the production. Besides, due to the people are busy within the modern city, an APP or method for consumers to read the relative information and APGS operation condition is needed. Both user J and V considered food is the most important part of daily life, they hope APGS can come to the real as soon as possible.
- Funds and pressure: University has limited manpower and funds, the government should give the comprehensive support or company can pay the fee before products hit the shelf. An independent operation for APGS is important, should avoid the external pressure. Besides, in general, there is the good university which holds the better credibility and some with the lower level. It might be the concern for consumer trust.

## 4.6. Casual User

Casual users are around 25 to 30 years old. They mainly eat outside, and not from the relative background. But both have the concern in Food Safety. Mr. Sun

was from computer science background and working as an engineer now. Miss. Huang was from an industrial design background and working as the designer now.

Mr. Sun mentioned that though he really wants to understand more there is no time for him to participate in the system like PGS. Due to the company apply for current certification also happen the Food Safety incidents, Casual users trust small-holder farmers more. The reason is they are small and in order to keep the good reputation, they will operate the proper production. Food produced by friends or recognizable source is the best system for casual users. With less knowledge of Food Safety, they choose to trust something close to them. Besides, Mr. Sun believes the product produced by developed country is better than local production. Miss. Huang trusts friends and family.

## Evaluation

Casual users gave the positive attitude toward APGS. However, they did not give much feedback toward the system. They do not really understand the current system but still have no confidence in Food Safety. Through the interview, the author found out that the product 'Looks' healthy or not shows a positive correlation with their decision. With higher intention to purchase the organic product, they believe the label which claims organic or non-toxic. The interview established that casual user likely influenced by interpersonal interaction which makes their judgment more emotional.

The result of four indexes for consumer trust is shown as follows:

- Competence: University holds the best competence with the research and publish. Besides, due to company and government lost credibility and far from consumers, the university is the most suitable place with expertise which also close to consumers.
- Transparency: The QR code is clear enough to show information, which creates the transparency toward consumers.
- Public interest: University holds more credibility than others to manage the Food Safety. However, there are two potential risks which might influence the university position toward public interests. The lobbying in

academic-industry collaboration and profit-oriented commercial competition. Although the university is non-profit, still has to be extremely careful.

- Honesty: University is neutral, without profit problem, therefore, they will tell the truth to the public.

## 4.7. Findings

The author presents the following results based on four consumer trust indexes that were used for the evaluation. APGS is highly valued. Users deeply agree that the university is a good entity and resource for managing the Food Safety. While the professional users were able to point out the potential risk within APGS, others could only ask for more information and detail about APGS. The following four indexes of trust were mostly commended by the users.

- Competence: APGS holds the ability and professional expertise to manage the Food Safety. Users suggested that it can become a four-year course for students led by professors. Not only connect the society but also build the consistent relationship.
- Transparency: APGS is able to release the information of Food Safety Management System transparently to the consumers and society. But the system should design a mechanism to avoid university from funding problem or external pressure, in order to create the entirely independent operation to keep the transparency.
- Public interest: APGS can make the decision base on public interest, right and benefit. Only has to avoid the industry-academic collaboration, which might affect the neutral position.
- Honesty: APGS will speak out the truth and take the responsibility when incidents happen. The feedback from users suggests that there should be an updating platform for APGS or government to announce the check result immediately, otherwise the company will only release the good news and hide the bad results.

The other feedbacks and questions received from users are categorized into three topics.

- Lobbying: Although the university has non-profit characteristic but still highly possible to drag into scandals or get involved in lobbying. Therefore, to create the entirely individual operation and clarify the legal revenue or even receive the funds from the government.
- Communication: Users asked for more detail about communication process in APGS, especially the casual users and frequent users want a simple and direct way to receive more information or attend the lecture. Besides, how to announce when any problem occurs.
- School difference: Users questioned that maybe not all of the university is able to implement the APGS. Private or lower ranking school might hold the less credibility.

Within the general observation, it is established that frequent user and the casual user can not speak a lot about the attitude toward the current system and their ideal system. Even they tell something, it is always slightly mistaken within the logic. APGS is expected to bring in Food Safety to their daily life.

All of the interviewees trust the small-scale production, the professional user can tell the reason, but others can not. It pointed out the important issue, consumer trust related to the slogan and promotion rather than accuracy.

Recently, the term 'Small-holder farmer' has been trending following the recent Food Safety incidents. Most of them have resorted to adding slogans related to organic or Food Safety instead of the name of the company, the farmer or the producer. Through the interview, the author found out people trust these products more than those of big companies. Consumer feels closer and more intimate to the small-holder farmer and thereby, generating trust. Professional users used the term 'small production' which means not related to a big company. They trust the people who work individually.



# Chapter 5

## Conclusion

### 5.1. Design Conclusion

APGS is a university-based Food Safety Management System which designed to increase consumer trust toward the Food Safety in Taiwan, also modified the shortcomings of PGS which are too much participation and no supervisor. This research went through stakeholders' interview and fieldwork for system feasibility. Also received the consist understanding of the current system and came to the conclusion of 'Academic Participatory Guarantee System' with three main concepts: 'University Qualification', 'Consumer Friendliness' and 'Government Supervision'. The design was evaluated by in-depth qualitative research with seven selected consumers and highly praised with positive feedback. Within the same category, the fieldwork established that 70 percent of products are from the small-scale business which has higher interaction with consumers. it is an important reason that interviewees believed APGS can raise the Food Safety level. The most valuable point for university to operate the FSMS is the assistance function with the competence. Certification bodies should not offer the consulting services, which is the principle of fairness. However, the main purpose and function of certification are to popularize Food Safety, and currently, most of the company or supplier has no ability to pass the certification. Meanwhile, the government does not have enough manpower to offer the assistance. Originally, certification body is the most suitable unit to work on consulting service, however, this might cause an unfair problem, that is the reason neutral and trustable institute should exist,

which is the University. According to the evaluation result, instead of creating the new certification for those not under control, APGS is the better solution. 'University Qualification' is able to compensate the insufficiency for Food Safety, through offering the consulting service and education with PGS flexibility.

The concept of 'Consumer Friendliness' is embedded in the system, consumers are able to access the operation of APGS, gain the knowledge about the Food Safety, furthermore, the system will be under mass surveillance.

There are mainly three questions from the interviewees:

- Since the Food Safety is a sensitive issue, how to reduce the social pressure for the university, further, to make sure the university has enough funding to work independently without any lobbying.
- There are level and expertise difference between universities, maybe some of them is not able to work on APGS.
- All interviewees considered not only managing the Food Safety, there is the missing part of food education which university is suitable to work on.

Base on the feedback, APGS must add in the mechanism to prevent the lobbying, in the other word, to make sure enough regular budget for independent operation. To avoid the academic-industry collaboration is not the wise way, it somehow limited the possibility and influence, furthermore, there is always a way to break the rule. Within 'Government Supervision' should not only supervises the institutions but funds their activities as well. This will avoid third party influence over the universities involved in the system. However, since privately funded institutions are under third-party influence from the start, APGS should be deployed and maintained by public institutions which direct under the government only.

All the interviewees pointed out that people need to be more aware of what they are consuming, and have the ability to judge. It established the persisting problem which is the necessity of Food and agriculture education. The issue related to another area which is different from the APGS design, therefore, it will be discussed separately.

## 5.2. Discussion

Certification is the precise science, which has the accurate step, but still impossible to claim hundred percent non-toxic. The reason is the cross-contamination in the environment, even all processes apply organic way, but there is no insurance that air or water bring some pesticide or the human pollution during the transportation or package. Even when consumers are picking, they bring some pollution while they touch. Therefore, the certification credibility will easily break, when the small problem occurs, consumers should understand more to avoid this situation, but scheme owners should also think from a consumer angle. Hundred percent certification does not exist, government and experts can only make it as precise as possible. The regulation now is based on science, but the result is for consumers, therefore they should think more for the user, the system would not work well under doubt.

The persisting problem within Consumer Trust toward Food Safety is education. University can provide the information and hold the lecture for masses, which is the social education. Besides, there is another way which is put into the compulsory education. Schools educate the students, build up outlook on the world, life and values, therefore, most of the people behave well in the society. Similarly, if consumers understand more about Food Safety, they will choose the better product, keep an eye on being careful, and the most important: Ability to judge. Food and agricultural education are divided into two parts, one is food education that combines nutrition, safety, and culture, the other is agriculture education which focuses on the food source, farming, and environment. It is the necessary training which should start from elementary school, cultivate the accurate knowledge of Food Safety gradually. When those students grow up, they are able to affect the market and the make the right judgment on Food Safety issues. Currently, less school is working on food and agriculture education, even some of them did, teachers teach only the knowledge which written on the textbook, but without the practical and in-field experience, it is incomplete. Through the research, the author found out a cultivation method: Synecoculture which originate from Japan is suitable for food and agriculture education in Taiwan. Synecoculture is an open-field crop cultivation method, which eliminates the use of tillage, fertilizer, pesticide, herbicide and totally relies on the productivity based on bio-

diversity. There is three advantage to introduce Synecoculture to the elementary school:

- Less field labor which makes easier access for elementary school students to experience and understand.
- It includes both knowledge and practice: Learning about biodiversity and the training of farming skills.
- Elementary school is the primary official education that makes an important influence in one' s life.

The primary object of introducing this system into elementary school is to raise future educators and students' confidence and familiarity to farming. Inspire their concern about agriculture, and rethink the origin of food. The first step is to build teachers' know-how and skill of Synecoculture. After they become more familiar with field working and acquire farming skill, the next step is to realize and fuse the agriculture education into the courses and let students work practically in the field. This action will propose series of courses in a practical way, the object is food knowledge building for students. It is the attempt to solve the persisting problem of Food Safety and conducts to the entire system of food and agriculture education for Taiwan.

### **5.3. Future Work and Research**

This research built the structure of APGS, the operation details are conducted to the future research. In most of the cases, PGSs are NGO and the system validity is not admitted by the government, however, with the participation of public university, there is a possibility to build an APGS alliance which has potential to be approved officially. In Asia, most of the countries have the small-scale production without any supervision. One of the feedback from evaluation is 'University Qualification' has to be active rather than wait for the company to join. This relied on the legislation and collaboration with government. It can also take the example from US FSMA to become a mandatory standard. Take a glimpse at Asia, most of the countries have the small-scale production without any supervision. Therefore, like ISO22000 and HACCP, APGS is also expected to apply

internationally, a unique Food Safety Management System for Asia. Further, Europe has GFSI and US has FSMA, but there is no specific standard for Asia, though Asia has the most population and special food chain environment. The food business mostly is the small and local scale from the field to the restaurant. Also, the cooking way in Asia is unique and different from EU and US. The author selected Food quality as the point for future research on building the Asia Food Safety standard.

Although PGS holds the flexibility, it still needs a general standard for quality control. For this part, Japanese consume the fresher and higher quality than other countries. There is no special regulation of quality in Japan, therefore, production system, consumer awareness, and suppliers pride are considered as the reasons. Future research aims to build the quality standard base on Japan experience. The other valuable research will be the 'How Asian productions meet legislation in a foreign country'. The core purpose of future research is the quality management system and Food Safety preparedness for the small and medium size food industry enterprises in Asia.

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# Appendix

## A. PGS Key Features

To implement PGS, in detail, nine Key Features of a PGS are listed by IFOAM in guild lines.

### 1. Standards and Norms

It conceived by the stakeholders through a democratic and participatory process, but always in accordance with the commonly understood sense of what constitutes an safety product. The norms should stimulate creativity, which is a characteristic of organic farmers, instead of inhibit it.

### 2. Grass Roots Organization

The Participatory Certification should be perceived as a result of a social dynamic, based on an active organization of all stakeholders.

### 3. Suitable to Small Holder Agriculture

Being suitable for small holder agriculture means that a PGS will be designed to be culturally appropriate, affordable and appropriate in terms of the paper work and other systems and processes.

### 4. Principles and Values

PGSs are characterized by clearly defined principles and values that are documented and may be expressed through the standards, operations manual, public

meetings and via the farmer pledge. These principles and values can be shaped around fair-trade, social justice as well as being environmentally orientated and culturally appropriate.

## **5.Documented Management Systems and Procedures**

The PGS systems and procedures should be documented. The depth and complexity of this documentation will vary between PGSs and can evolve over time. As with any quality assurance system there is an expectation of ongoing improvement as lessons are learned and the organization gains experience. It is better to begin with something basic that can be built on than to not start at all. Documents can include :

- Standards
- Data base: List of members, status, products, details of each farm, crops, history, field sizes etc.
- PGS Operations Manual
- Technical notes for advisors

## **6.Mechanisms to Verify Producer Compliance**

It can include:

- A description of the production activities and management plan
- A producer pledge
- Knowledge building
- Sharing responsibilities and reinforcing the idea of horizontality at all level of a PGS

## **7.Mechanisms for Supporting Suppliers**

It can be providing market information, technical support and promotion.

## **8. Seals or labels**

providing evidence of organic status. A seal (official stamp) is used by a PGS to provide an official endorsement of key documents such as producer's certificates. Certificates are usually renewed each year and thus the length of time the seal is valid for is usually noted on the same document. The use of the seal is controlled and managed by nominated persons

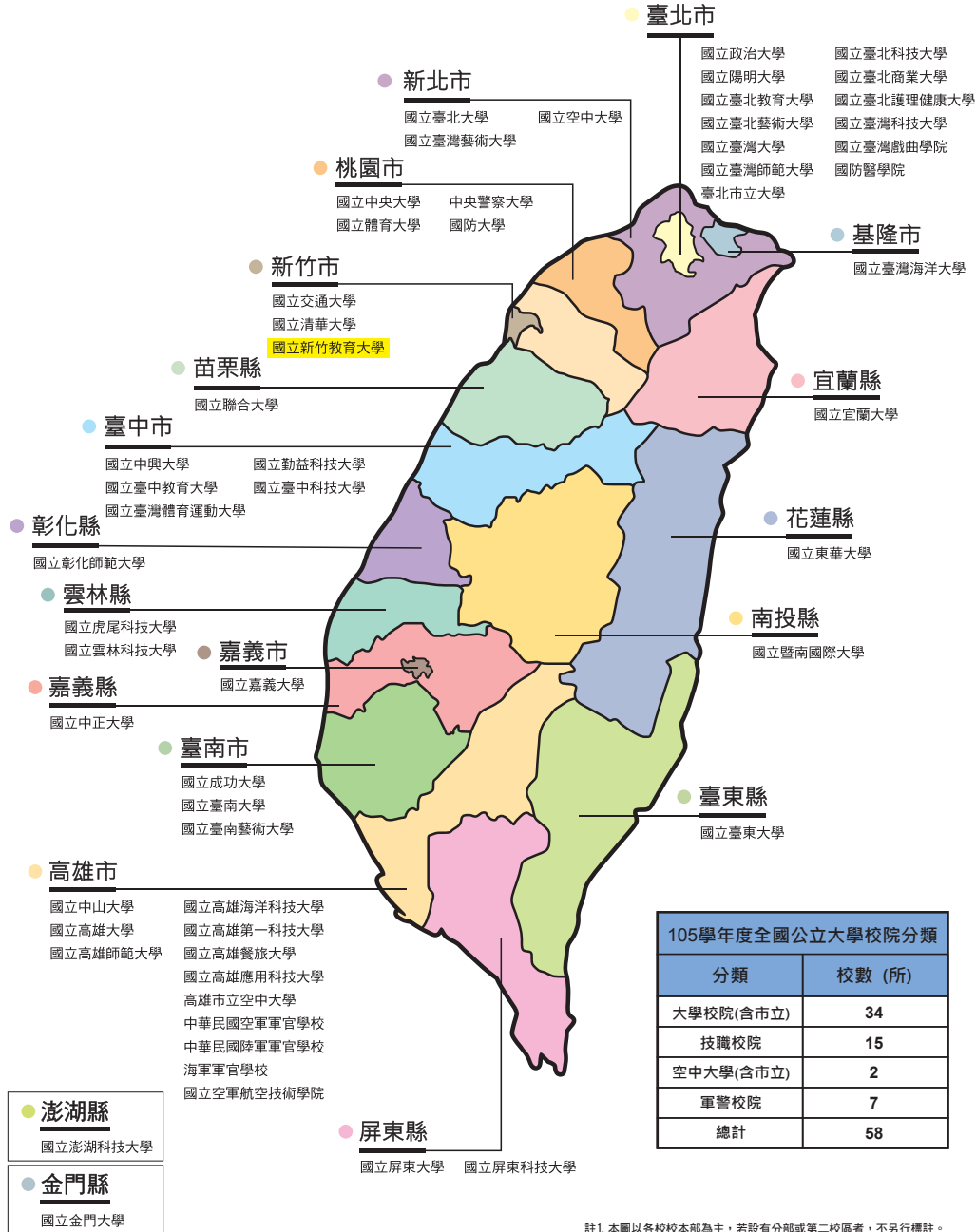
## **9. Clear and Previously Defined Consequences**

for farmers not complying with standards, actions recorded in a data base or made public in some way. There will always be circumstances where producers are unable or fail to comply with the standards and norms of their PGS. In most cases it seems these non-compliances are minor in that they are mostly centered on the perennial challenge of record keeping, however, in some cases the non-compliance might be more serious, such as the deliberate use of a prohibited input or the mislabeling of product. It is logical then that the consequences for non-compliance will be graded to fit with the seriousness of the non-compliance.

B. Diagram of University Distribution

# 105學年度公立大學校院分布圖

(105.10.15版)



註1. 本圖以各校校本部為主，若設有分部或第二校區者，不另行標註。  
 註2. 本圖依學校名稱筆畫、分類及體系等由左至右排列。

Figure 5.1: The distribution of public university.

# 105 學年度私立大學校院分布圖

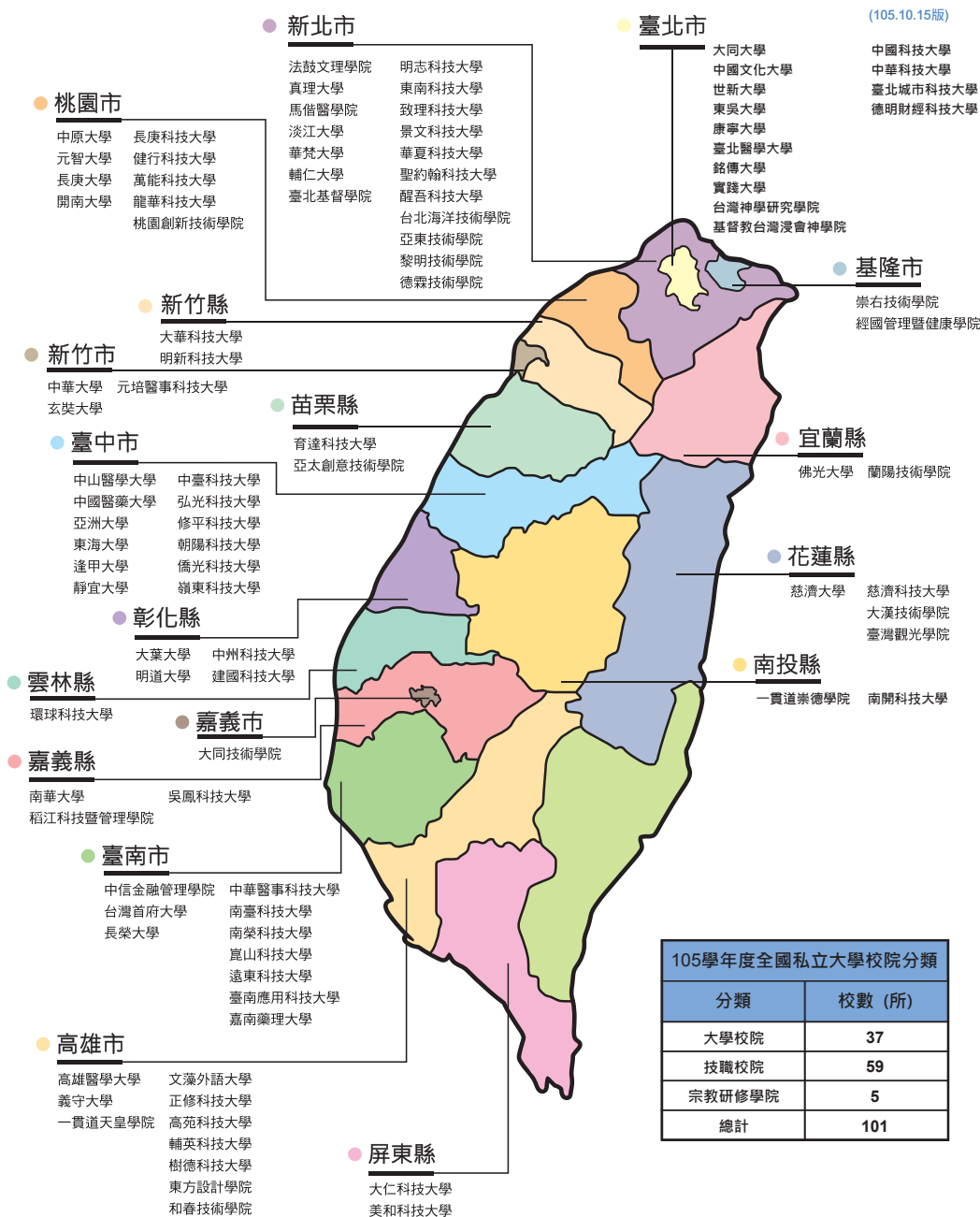


Figure 5.2: The distribution of private university.