



Risk Analysis of Material Flow in Restaurant

Nguyen T. D. Tran

Bachelor Thesis
International Business
2019

DEGREE THESIS	
Arcada	
Degree Programme:	International Business
Identification number:	
Author:	Nguyen T. D. Tran
Title:	Risk Analysis of Material Flow in Restaurant
Supervisor (Arcada):	Susanna Fabricius
Commissioned by:	
<p>Abstract:</p> <p>Restaurant industry has long developed among other industries in the economy pie chart. The complex logistics system plays an important role behind every restaurant. It involves various stakeholders: suppliers, warehouse managers, vendors, and customers. In every stage of this supply chain, there are various risks hidden. Some risks are underrated while others are overrated. This problem creates troubles and makes the operation of a restaurant unsmooth and less effective. Therefore, this thesis is written to identify and analyze those risks in the supply chain and particularly, in material flow for better understanding how likely and severe they could be. Material flow is one of the main flows in the supply chain of a restaurant. It involves different activities in a specific timeline and requires proper preparation beforehand. Material flow plays a key role in the logistics process. The aim of this thesis is to identify risks in the flow and analyze them in models and calculations to give out the comprehensive analysis. To do that, the theoretical framework reviews literature about supply chain and material flow. The second theory is risk management including models for examination. In order to identify the risks hidden in the procedure, an interview was carried out with a restaurant in Helsinki. The text data after interview was used to discuss about the likelihood of different risk types as well as their severity. After that, risks were scored and put in the Risk Map, Risk Prioritization model and studied. The finding is statistics of risk groups with suggested solutions and response strategy. Updating information and applying changes in risk analysis where applicable are necessary. This study covered issues related to risks in logistics perspective only. It also focuses on small and</p>	

medium restaurants which contain 10-50 people. The larger the restaurant is, the more complex method may be required.

Keywords:	Risk management, material flow, restaurant, supply chain management
Number of pages:	43
Language:	English
Date of acceptance:	

CONTENTS

1	Introduction.....	1
1.1	Research Aim & Research Questions	2
1.2	Demarcation	2
1.3	Structure of study.....	2
2	Theoretical framework.....	3
2.1	Supply Chain Network and three main flows.....	3
2.2	Risk Management	6
2.3	Risk	6
2.3.1	<i>Definition</i>	6
2.3.2	<i>Different Aspects of Risks</i>	7
2.4	Risk Management Plan	8
2.4.1	<i>Definition</i>	8
2.4.2	<i>Benefits of Risk Management</i>	8
2.4.3	<i>Risk Management Process</i>	8
3	Methodology	13
3.1	Material and Approaching Method.....	13
3.2	Data Collection	14
3.3	Data analysis and interpretation	14
4	Expected results.....	15
4.1	Material Flow in Restaurant.....	15
4.2	Risk Analysis	16
4.2.1	<i>Risk Identification</i>	16
4.2.2	<i>Risk Measurement</i>	19
4.2.3	<i>Risk Analysis</i>	20
5	Discussion	25
6	Research conclusion.....	26
	References	28
	Appendices	31
	APPENDIX A.....	32
	APPENDIX B.....	35

Figures

Figure 1. Supply Chain Network.....	4
Figure 2. Risk Map (National Economic of Health Institute).....	10
Figure 3. Acquisition Risk Management Risk Prioritization (Risk Management Toolkit)	11
Figure 4. Operational Risk Management Risk Prioritization (Risk Management Toolkit)	11
Figure 5. Risk Management process (CGMA, 2013).....	13
Figure 6. Material Flow in a restaurant.....	16

Tables

Table 1. Risk Identification in each stage of the material flow.....	18
Table 2. Risk Measurement.....	19
Table 3. Risk Assessment in FUKU restaurant case	21
Table 4. Response Strategy	25
Table 5. Questions in the interview	32

1 INTRODUCTION

Restaurant industry has long developed among other industries in the economy pie chart. The complex logistics system plays an important role behind every restaurant. It involves various stakeholders from suppliers, warehouse managers, vendors, and customers. In every stage of this supply chain, there are risks hidden. Some risks are underestimated while others are overrated. This problem creates troubles and makes the operation of a restaurant unsmooth and less effective. Therefore, this thesis is written to identify and analyze those risks for better understanding how likely and severe they could be.

Supply chain is the process of different stages from buying material from suppliers to delivery to customers. There are three main flows in the chain. In this research, the author will focus on material flow, the central flow in the whole system. There are various hidden and unexpected risks that require fast and proper responses from the restaurant staff. Though the supply chain process is planned carefully, closely monitored and strictly followed, risk analysis is highly important and should be made with all stages in the material flow. The researcher will carry out the risk analysis of the material flow in a restaurant to identify risks, analyze them, then mitigate and avoid the consequences.

As a person who used to work in restaurants few years and had planned to start a business as a small restaurant in the near future, the author finds the material flow is the most important and challenging in the operation of the restaurant. Therefore, with a background studying logistics, the author carried out this research in hope firstly to identify all different kinds of risks and problems in the operation flow, and then assess them with risk analysis. The researcher hopes this study could be helpful for restaurant staff and for those who have planned to open a small restaurant in the future. Though there are previous researches and books about risk management in restaurant generally, to deepen the focus on the material flow, the author wants to bring out other aspects with detailed risk challenges by analyzing their likelihood as well as the impacts and finally drawing conclusion about the risk proportion with a clear solution strategy.

1.1 Research Aim & Research Questions

The thesis aims to analyze the material flow in the supply chain process of restaurant and provides its comprehensive picture.

In each stage of the material flow, risks will be identified and measured with scores for examination and other analyzing methods. Risk analysis within different phases of the process will be carried out in the research based on literature review about risk management model and qualitative method.

In general, the thesis answers 2 mains questions:

1. What risks influence the material flow of a restaurant?
2. How risks are grouped according to the severity of consequences and their likelihood?

1.2 Demarcation

The thesis covered issues related to risk in logistics perspective. Any other kind of risks that involves crime, for instance terrorism or murder are not covered in this thesis. Some legislations related to food and alcohol may be applied.

The thesis covers activities related to the supply chain model. Other activities not involved is excluded. The study focuses on small and medium restaurants which contains 10-50 people. The larger the restaurant is, the more complex method may be required.

1.3 Structure of study

The thesis has 3 main parts: theoretical framework, empirical part and further analysis and discussion. The first part involves theories related to the research. It includes theories about supply chain with the material flow and risk management plan. The empirical part describes the result of research answering two main questions.

1. What risk factors influence the material flow of a restaurant?

Based on the data collected, within each part of the material flow all risks will be listed out. This is the first stage in the risk management model, called “Risk Identification”.

2. How risks are grouped according to the severity of consequences and their likelihood?

After identifying all risks available in each part of the material flow, through the interview method and some material literatures, risks are measured by their likelihood and impacts. Hence, Risk Analysis will be carried out after measurement. Risks are ranked and put in Risk Map and based on this map, risks are grouped due to their probability of occurring and severity of impact.

In the later part of this thesis, further discussion about response strategy for each risk group will be discussed along with the reason behind. Depending on the level of the impact, risk groups have different ways to be treated. Some can be ignorable, some unable to avoid will have suggested solutions. Further analysis will be carried out more specific in the later part.

2 THEORETICAL FRAMEWORK

2.1 Supply Chain Network and three main flows

According to the Supply Chain Management: Terms and Glossary of Council of Supply Chain Management Professionals (CSCMP Glossary, 2013, p.186), *Supply Chain* is defined as a process buying raw materials from suppliers, turning them into final finished products and delivering to the end consumers. That is a network which involves many stakeholders: suppliers, vendors, service providers, customers, and links them together.

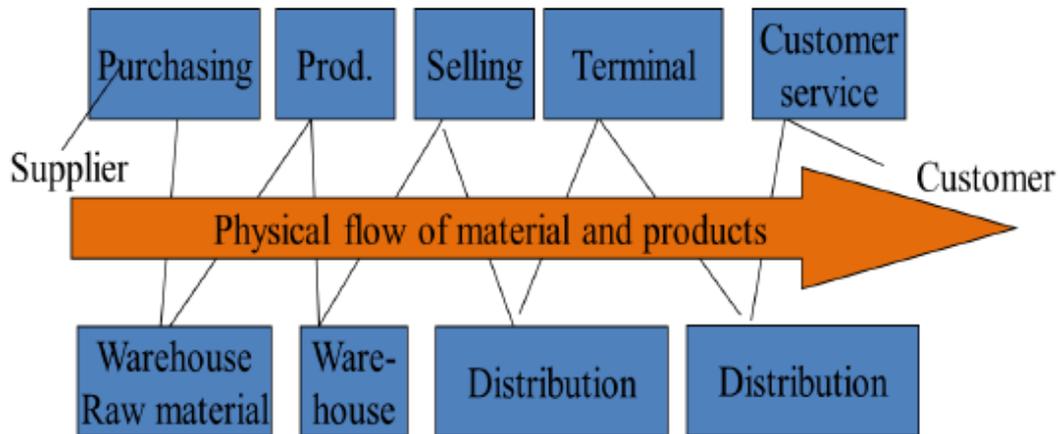


Figure 1. Supply Chain Network

Figure 1 above illustrates the network of the supply chain. There are different activities and many stakeholders involved in the whole process. First of all, the company buys raw material from the suppliers. This is the first stage in the network, and the activities in this stage are *purchasing and procurement*. Before finding suppliers, the company carries out a careful research about requirements of the raw material they are about to purchase. For example, the complex level, lifespan of goods; accepted time until obsolescence; warranty strategy; running and maintenance costs should be analyzed beforehand (Supply Management, 2013). Along with the requirements of raw material, market offerings are another target to carefully consider and compare (Supply Management, 2013). Depending on the demand of goods, national market may be rare while globally the market seems more promising. The choice of suppliers depends on various factors such as quality, price, delivery cost, and so on. This is one of the most important phases in the process. After understanding the requirements of raw materials and evaluating offerings from suppliers, the next step in this phase is *negotiation*. The more specific requirement of the material and transparent pricing document, the easier the company can negotiate reaching the specific need at the right price (Supply Management, 2013). When the agreement is made between the company and the final supplier, their relationship has established and believed to last long-term.

After purchasing and procurement, the raw material is delivered to a warehouse. Depending on the type of goods, the storage is designed to be suitable for stocking. For example with food, there are different requirements for each type of foods which are “*dry food*,

frozen food, dairy food, process and fresh meats” (BC Campus Open Education). Regarding to temperature, dry food should be stored between 10 and 15 degree Celsius while the ideal temperature for refrigerated products such as fresh meat, seafood, poultry is 4 degree Celsius or below. Dairy foods and produce are stored from 2 degree to 5 degree Celsius to remain the freshness of the products. For frozen product, the temperature of -18 degree Celsius is required (BC Campus Open Education). For other goods that do not require specific requirement for temperature, the storage can be set at the default temperature, away from direct sunlight. Some goods can be stored mixed with others, some cannot. In summary, the storage design and traits depend on the products and goods.

There are two types of management of the warehouse. They are warehouse management and inventory management. Warehouse management involves tasks about technology used and transport as well as the distribution taking care of warehouse of the whole business. Inventory management, on the other hand, more focuses on products such as tracking and monitoring the amount of products keeps in the storage (Unleashed, 2015). Inventory managers concern about the inventory cycles, the level stock, the value of the product (raw material, semi-finished product or ‘ready to sell’ goods), specific specifications of the goods. The storing raw material phase soon comes to the next stage in the process, manufacturing.

Producing is the most important step in the entire system. The raw material bought from suppliers is delivered to the factory and turns into semi-finished or finished products. This stage requires different resources such as material, equipment, utilities, and intellectual assets, humans. After that, finished products will be put in warehouse again. This warehouse is different from the warehouse of raw material (Vaidya, Wall Street Mojo). Semi-finished products are also stored there being ready for the next time producing in the factory while the finished products are ready to be sold. Finished products will be distributed to different channels such as retailers or wholesale places and finally be delivered to the end users. That is a whole supply chain network. It is also a movement of material, called material flow.

There are various definitions of material flow from professors and experts around the world. According to Logistiikan Maaailma, “*material flow goes at first from suppliers to*

customers (from upstream to downstream)”. In a simple way, **material flow** is the process that the material runs throughout all stages of the whole supply chain in the system. Material flows depends on the process and specification of operation.

2.2 Risk Management

Thousands of activities and processes occur worldwide every day. Each activity and process contains high amount of probability of uncertainties that might happen and affect the ending result. From a simple activity such as going to school to a complicated issue like global warming, they all include multitude possibilities of change. Those interferes form unexpected issues which are needed to be handled carefully beforehand. People called them RISK. In any civilization throughout the history, people always try to prevent and avoid unexpected circumstances with various methods beside solutions. Those methods and solutions are carried out to maintain the acceptable safety level. They are called Risk Management Plan.

2.3 Risk

2.3.1 Definition

To go deeper into this subject, firstly, the term Risk should be viewed based on the concept and explanation of various authors and professionals over years ago. According to Business Dictionary, **Risk** is “*a probability or threat of damage, injury, liability, loss, or any other negative occurrence*”. It is created by internal or external factors which cause negative result. Risk exists in various fields and majors in daily life. From everyday life issue such as the food people consume might contain risks of bacteria or contaminated, to the macro issues in finance about capital risk or liquidity risk, they all consist of uncertainties and possibilities.

Even though risk is clearly defined as above, it's usually mistaken with uncertainty. It's also different from hazard and clearly not a peril (*Risk – Controlling the risks in the workplace*).

First of all, Risk is not uncertainty. While uncertainty refers to the occurrence which people don't know whether its effect brings positive or negative result, risk is usually indicated as a factor leading to bad consequences. Risk is neither a hazard. According to Health and Safety Executive (*Risk – Controlling the risks in the workplace*), a hazard is a substance such as a sharp tool, chemical or electricity, which might cause harm whilst a risk combined both the chance the harm happens and the level of its impact.

Now, the Risk term has been clearly defined and people start to wonder why they have risk. As mentioned above, risks hide in thousands of activities everyday life (Damodaran, 2017, p.1). When people get up from bed in the early morning, there might be a chance, they fall right once they step on the floor. It might be a wet floor or there is toy of children on the ground, many possible reasons may lead to the accident. Furthermore, to some enormous problems, there are thousands of probabilities for a bankruptcy. It could be the lack of liquidity, low Return on Investment (ROI) and other multitude reasons. Therefore, tons of things will happen without expectation. What people could do is to identify important risks which might have severe effect and try to avoid it.

2.3.2 Different Aspects of Risks

In another aspect, risk is not always bad. It combines positive and negative effect. Everything comes with the price. Sometimes, risks provide opportunities and rewards. The bigger risk, the bigger reward. For instance, in banking, when you put money for saving, the higher the interest is, the higher the risk is and vice versa. Therefore, if you accept to take big risk, you might have a chance to get big reward. This attitude is called Risk appetite (QualityGurus, 2013), one of the Risk concepts. As mentioned before, Risk appetite is the amount and kind of Risk that the risk owner accepts and tolerates with it. Another term is Risk tolerance. It's about the readiness to cope with risk after all methods, solutions and treatment. The other Risk concepts which are Risk philosophy, Risk strategy and Risk culture (CGMA, 2013) should also be taken into account for Risk analysis.

2.4 Risk Management Plan

2.4.1 Definition

Risk management is a term that has been defined by plenty of authors and professionals. According to Chartered Global Management Accountant (CGMA) (2013),

“Enterprise Resource Management (ERM) is the process of identifying and addressing methodically the potential events that represent risks to the achievement of strategic objectives, or to opportunities to gain competitive advantage”.

In short, it's a process with different stages: identify risks, assess them, provide response strategy, implement solutions and methods and finally, review and monitor the performance.

2.4.2 Benefits of Risk Management

Risk Management helps to understand clearly risks, the conditions, likelihood and impacts. By implementing Risk Management, people have fewer unexpected events happened. In consequence, people have more control in the process and activities that are carried out. The operation becomes more effective with less expense and time saving. This also helps for a better decision where people can control and enhance the proficiency of a whole process.

Risk Management process can be applied widely in plenty of fields such as project management, military, space, medical, engineering, safety and financing of economy (QualityGuurus, 2013). No matter it is applied in any aspect, there is a frame for this process.

2.4.3 Risk Management Process

First of all, risk owners should know what they are doing. They can draw a plan and strategy. They should also turn those plans into reality by steps and the path to achieve it. After that, the scope and its environment are analyzed carefully in order to set up the objectives and goals. Each activity in the planned is put into careful consideration for identifying risks.

Now, the Risk Management process is officially implemented based on the plans and process above.

Step 1: Risk Identification

Every activity in a process contains various chance of risks and influences. It could be positive either negative. The responsibility of risk analyst is to investigate and list out all possible factors that could affect the process which might change the final result. To evaluate risk, basic questions need to be answered orderly. What? Who? How? Where? How long? How much? (Greenfacts, 2014).

The first question, What?. What creates harm and risks? A hazard could be a substance or abstract. But in general, there are 4 types of hazard usually causing risks. It could be chemical, physical, mental or biological (Greenfacts, 2014). A chemical hazard is easily found in chemicals of working environment. The carelessness of chemicals, before, in and after use, might create an enormous impact. Mental hazard is usually for employees, where the work load, long working hours or bullying causes psychological problems. A physical hazard might be the loss in delivery or robbery. And finally, the biological issues usually take place in food and health industry, where they deal with bacteria, causing food contaminated, and viruses, leading to diseases and health problems. All those hazards hide in all activities, processes and substances in operation.

The next question, Who? It could be a contract staff, full-time and part-time; visitors; clients or any related stakeholders, those who have interact and in charge of the operation might contain risks. Then, how could they create risks and get harmed? In order to answer this question, all the activities in the process need to be reviewed meticulously, the routine and work of staff in various areas. They will be put in careful and serious consideration in all circumstances (Health and Safety Executive, *Decide who might be harmed and how*).

To analyze in more details about those risks, after defining all factors that could leave impact and its conditions, people can't bear asking what happened then. Analyst might have to anticipate for how long it might take to estimate the damage, how much it costs,

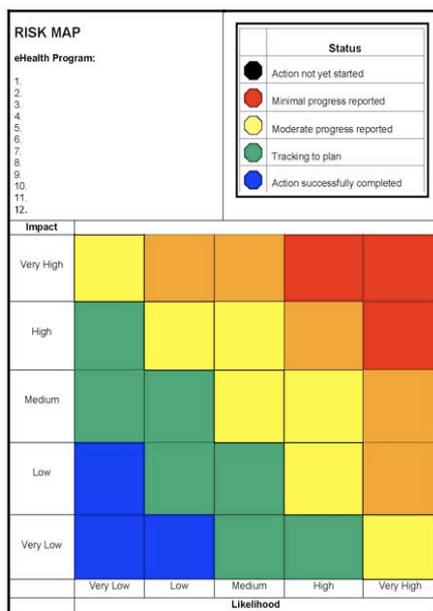
what the solutions could be, either get rid of it or accept it if the risk is unavoidable, and lastly how to control or prevent it (Health and Safety Executive, *Evaluate the risks*). All those questions need to be asked and answered carefully so that they could support the assessment stage.

Step 2: Risk Assessment

The risk calculation are usually based on 3 main factors: frequency, conditions and length of exposure (Greenfacts, 2014). Nevertheless, sometimes it's hard to quantify risks because of various reasons. It might be the complicated system, it's too complex to calculate and draw a final decision. Or, it could be lack of tools to measure such as Nano-materials. Besides, the risk and its proportion as well as perception somehow are not aligned. So, to be able to clarify the cause, conditions and impacts, clues need to be found based on fact in reality.

There are several frameworks for risk management. However, the Risk map following (figure 2) is a general framework that is used for different models.

According to this map, the impact and likelihood changes along the vertical and horizontal lines, respectively. Different colors in squares define the level of severity of each square.



The first model using this map is Acquisition Risk Management Risk Prioritization (figure 3).

In the next figure, the likelihood presents in the vertical line, whereas the impact is described as a horizontal line. The frequency here is calculated with the percent, probability of which the event could happen. All risks clarified in this model are categorized into 3 main types: Low, Medium and High risks. Different solutions are offered based on the type of risk.

Figure 2. Risk Map (National Economic of Health Institute)

	Negligible	Minor	Moderate	Serious	Critical
0 - 10%	LOW	LOW	LOW	MED	MED
11 - 40%	LOW	LOW	MED	MED	HIGH
41 - 60%	LOW	MED	MED	MED	HIGH
61 - 90%	MED	MED	MED	MED	HIGH
91- 100%	MED	HIGH	HIGH	HIGH	HIGH

Reference: Franklin, C. E., Lt. Gen (USAF) Commander ESC, January Memorandum for ESC Program Managers, ESC/CC, Risk Management, Department of the Air Force, Headquarters ESC (AFMC) Hanscom Air Force Base, MA.

Figure 3. Acquisition Risk Management Risk Prioritization (Risk Management Toolkit)

Another model that also uses this map is Operational Risk Management Risk Prioritization (figure 4).

			Probability				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
S E R I O U S N E S S I T Y	Catastrophic	I	1	2	6	8	12
	Critical	II	3	4	7	11	15
	Moderate	III	5	9	10	14	16
	Negligible	IV	13	17	18	19	20
			Risk Levels				

Reference: Pocket Guide to Operational Risk Management

Figure 4. Operational Risk Management Risk Prioritization (Risk Management Toolkit)

Unlike the model above, this one has some differences in the way of calculating probability. It uses the level of seriousness as a demonstration for the impact. Inside the table, all the squares are numbered based on the importance of risk which should be highly focused. According to that, the square number 1 with the most frequency and highest impact is the most dangerous risk that requires full attention.

The bold lines draw out borders classifying groups of risk to focus on. Based on the table above, the highest risk group is number 1, 2, 3. The next one is 4, 6, 7, 8 followed by group of 5 and 13. The rest are considered normal risk. According to each group, different responses and solutions are discussed and applied.

Step 3: Risk Response Strategy

Figure 2 illustrates few main risk groups and their solution. The first one is Low risk group. This type of risk can be accepted and tolerated it as usually, it has the least frequency and negligible impact. The second group type is Moderate risk, in order to cope with this risk, the good solution is to transfer or to share through insurance either joint vendor or other arrangement. To the third group, which rate is High in the likelihood of occurring as well as the level of severity in consequences, risks need to be mitigated and reduced as much as possible via control and limit the exposure to danger. Lastly, with the Severe risk group, this type of risk should be avoided.

Sometimes, there are also opportunities after risk, the board manager should also consider it carefully to exploit and maximize its advantages.

In any specific circumstance, acceptable safety level is required. Hence, the most suitable solutions need to be given within the right time.

Step 4: Implement the strategy

With the plan drawn, required actionis should be executed in the shortest time to avoid any possible risks ahead. All findings ought to be in record and handed out to everyone to read and be aware. (Health and Safety Executive, *Record your significant findings*).

Step 5: Monitor Performance

The board controls, supervises and observes carefully the process and risk responses to gain the best result. At the end, self-assessment should be made by the company or internal audit. (Health and Safety Executive, *Review your risk assessment and update if necessary*).

The following chart shows clearly all stages in the Risk Management.



Figure 5. Risk Management process (CGMA, 2013)

In short, risk is available in every activity and process from the simple action people do every day to huge issues such as global economy. It's simply a harm which could affect the ending result, while security is to prevent any chance that risk could happen. The Risk Management process combines different stages from Risk Identification, Risk Assessment, to Plan Response Strategy, Implement Mitigation Strategy and lastly, Monitor Performance. Figure 5 above summarizes all the steps mentioned about Risk Management Plan.

3 METHODOLOGY

3.1 Material and Approaching Method

Both primary and secondary data are applied in the thesis. Secondary data is based on research about supply chain and risk management model while primary data are taken from the interview with people who work or own a restaurant.

The theoretical research is based on secondary data. The resources are from books and literatures for identification of different concepts and process explanation. The empirical part is based on both primary and secondary data. Secondary data is taken from researches in the same topic, then the primary data is written by the author to examine and develop further risk management strategy.

The thesis applies qualitative research as an approach. According to Center for Innovation in Researching and Teaching (CIRT, *Qualitative Approaches*), a qualitative research is defined as “*a systematic, subjective approach used to describe life experiences and give them meaning*”. This approach focuses on the whole and explore the depth and complexity. Methods used for taking data is interview with questionnaire and some observations. The interviewee is a Chinese manager at Fuku sushi restaurant at Fredrikinkatu 36 in Helsinki who has many year experience in managing the operation of the restaurant. Throughout the interview, all risks that are written in the questionnaire happened to the restaurant. The interviewee is very open sharing her experience and inside thoughts about risks and rate them with careful consideration.

3.2 Data Collection

Firstly, secondary data for theoretical framework and first part of empirical study were taken from several researches and other trustworthy sources available on the Internet. The primary data was taken by interview. The interview was carried out face-to-face in a semi-structured form.

3.3 Data analysis and interpretation

According to Center for Innovation in Research and Teaching (CIRT, *Analyzing Qualitative Data*), there are five main steps that are commonly used in qualitative data analysis. The first step is to get used to the data by reading data over and over, writing down any impressions, looking for meaning and valuable data, exploring depth and trying to look at the new angle of the big picture. Secondly, the data should be reread and this time, researchers should find important parts which answer the particular questions of the analysis.

The third step is to classify data and create a framework. Selected data now can be put in framework which will be a structure for the analysis. The analysis can be explanatory based on the data and the research questions. Fourthly, based on the important selected data in the framework, the researchers could identify the relationship or connection between them and explain the link. Illustrations by diagrams, lists or tables are a good way to interpret data and discuss them further. Researchers explain data in deeper level and explore other significant meanings (CIRT, *Analyzing Qualitative Data*).

In this thesis, the information taken from the interview is analyzed to support the theory question. Text data from interview is taken to study the likelihood and severity of various risks defined. Next, the Risk Management model is applied to analyze and based on the number rankings, all risks are put in the risk matrix. After that, the data is categorized into different groups, from the most severe to the least harm. Through the numbers, each risk will be explained why to be put in different groups. Further discussion and explanation for each risk group is the main part of the data interpretation.

4 EXPECTED RESULTS

4.1 Material Flow in Restaurant

In the restaurant industry, the diagram below (figure 6) clearly illustrates stages required in a material flow. Beginning with the receiving stage, the restaurant buys raw material and resources from suppliers. These resources are stored waiting for the next part. The place to store could be a refrigerator or special storage that is suitable to the requirement of food's specification.

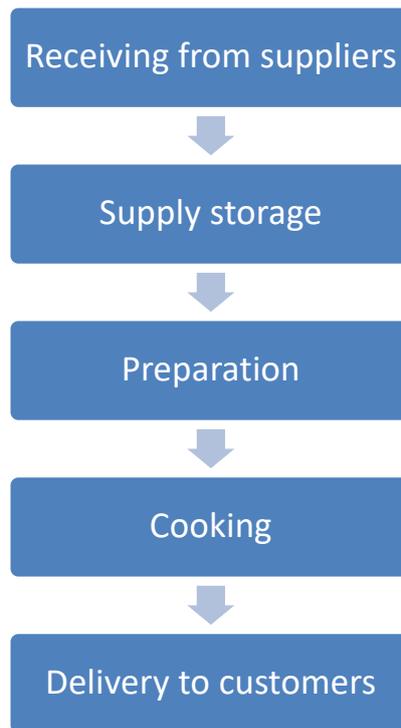


Figure 6. Material Flow in a restaurant

The third part is cooking. This is the main part in the flow because it generates profit. In order to provide a meal, all raw material and resources combined with ingredients are exploited to maximize the quality of a meal. In the next stage, delivery should be well monitored since it represents result of the whole flow. Even a small risk could affect the ending result.

4.2 Risk Analysis

4.2.1 Risk Identification

In every stage of the flow above contains plenty of risks which could influence the smoothness of the whole chain.

Firstly, *receiving raw material from suppliers*, there are many risks that may happen. It can be wrong quantity in the order or lack of resources. It's even worse with bad quality

of food or unreasonable price. Time always matters in delivery. What will happen if suppliers deliver not on time? Is it the wrong delivery or it's lost on the way of shipment? (Lu, L & Ti, D 2014, p. 37-38).

Secondly, *storage* needs to be taken care carefully. Raw material should be stored in a freezer or at low temperature. They should be separated with ripe or finished food to prevent contamination. In the *preparation* stage, tools and equipment play an important role in the hygiene level of food. Knife, fork, and plate should be washed constantly with strong chemicals and put through steamer to lower the risk of bacteria. Otherwise, it provides high chance of infection. Refrigerator, dishwasher, freezer and other equipment should be checked frequently for the quality of food to meet the satisfaction of customers.

Fourthly, *food production* or cooking is the crucial stage in this flow. Every safety standard related to this field must be applied seriously based on the food law, regulation and legislation. All activities should be monitored and supervised carefully to avoid mistake and any chance of accident. In the final phase, *delivering*. This is important as well as the former part because it could affect the ending result. Wrong or late delivery and especially bad quality might create dissatisfaction in customers and damage the reputation of the restaurant.

Table 1. Risk Identification in each stage of the material flow

Stages	Risks in each stage
Receiving from supplier	<ul style="list-style-type: none"> - Miscommunication (1) - Wrong quantity delivery, which is different in the amount ordered (2) - Shortage of raw material (3) - Disqualified food product because of damage in delivery (4) - Bad quality product from suppliers (5) - Unreasonable price of raw material (6) - Delayed delivery (7) - Wrong delivery (8) - Lost in delivery (9)
Storage	<ul style="list-style-type: none"> - Risk of contamination from raw products (live seafood, uncooked pork and beef, etc.) (10) - Risk of disqualified of normal products (fruit, vegetable, etc.) (11) - Risk of cooked food (contaminated or disqualified) (12) - Too much junk food (13) - Problems in equipment (refrigerator, freezer, etc.) (14) - Uncleaned tools (knife, fork, plate, etc) (15)
Preparation and Cooking	<ul style="list-style-type: none"> - Not follow safety standard (16) - Risk in the flow of consistent food serving (17) - Risks in staff's attitude and awareness of hygiene and quality (18) - Risks of cooking mistake (overcooked, undercooked, seasoning mistake) (19) - Bad quality in food (20)
Delivery to customers	<ul style="list-style-type: none"> - Risks of damage in food quality during delivery. (21) - Wrong delivery to customers. (22)

Based on the collected data (see the Appendix A and B), the interviewee helped the author identify main problems and risks in each phase of the supply chain network. Those risks are summarized in the table 1 above.

4.2.2 Risk Measurement

Based on the table 1 above, each risk is given two scores by the interviewee, one for the likelihood of the risk occurring and the other one is scored based on the level of severity of the risks. The grade ranges from 1 to 5, where 1 is for very low, 2 is low, 3 is medium, 4 is high and 5 is very high.

Table 2. Risk Measurement

Stages	Risks	Likelihood	Impact
Receiving from suppliers	Miscommunication	2	4
	Wrong quantity delivery, which is different in the amount ordered	5	4
	Shortage of raw material	1	3
	Disqualified food product because of damage in delivery	5	5
	Bad quality product from suppliers	3	4
	Unreasonable price of raw material	2	2
	Delayed delivery	5	3
	Wrong delivery	4	3
	Lost in delivery	1	2
Storage	Contaminated raw food	4	4
	Disqualified normal products	2	3
	Rotten cooked food	4	4
	Surplus food	3	1
	Problems with equipment	2	5

	Uncleaned tools	1	4
Preparation and Cooking	Not follow safety standards	2	4
	Risk in the flow of consistent food serving	4	5
	Unawareness of Hygiene and Quality from staff	1	5
	Cooking mistake	3	3
	Bad quality food	3	5
Delivery to Customers	Damage of food quality during delivery	4	5
	Wrong delivery	3	4

After measuring the risks with scores, risks are put in the risk map and ready for the analysis.

4.2.3 Risk Analysis

Based on the likelihood and the severity of consequence of each risk, it is put on Risk Map (table 3). This map defines the category that risk belongs to. There are four zones in the map. First of all, the red zone includes risks that have high score in likelihood, which means the risk tends to occur frequently and also high score in the level of impact, which indicates the catastrophic consequences. This is the group of risks that need to be avoided the most. Secondly, the yellow zone consists of risks that have medium score in likelihood or medium score in the level of impact. The third area is green that have score range from medium to low in the probability and the level of impact. The last one is the blue zone, which have very low or low score in chances occurring as well as the score in the level of severity.

Table 3. Risk Assessment in FUKU restaurant case

Impact					
Very High	18	14	20	17, 21	4
High	15	1, 16	5, 22	10, 12	7
Medium	3	11	19	8	2
Low	9	6			
Very Low			13		
	Very Low	Low	Me- dium	High	Very High
	Likelihood				

The map above is separated into four main parts. Risks in the red area has the highest probability of occurring and catastrophic impact on the supply chain. In the yellow area, the impact of risks is serious and less likely to occur than the red zone. The next area has green color. Risks in this zone have moderate consequences and medium to high chance of happening. Lastly, the blue zone contain risks that have slight chance of occurring and their impact is negligible.

As we can see in the table 3, there are nine risks in the red zone, seven risks in the yellow zone, five risks in green zone, and lastly 1 risks in the least harm area, blue zone.

First of all, risks in the red zone are the most dangerous in the supply chain because they occur frequently and have catastrophic impact. There are nine risks in this area. The most dangerous risk based on the map (table 3) is number 4, disqualified food product because of damage in delivery. This risk is in the first stage of the material flow in restaurant (figure 6), receiving goods from suppliers. As food is a special product that even there is no accident to the box containing goods, through time, food becomes disqualified and it happens frequently. When the food comes to the restaurant is disqualified, the restaurant

is put in a tough circumstance as the disqualified food from restaurant needs to be replaced as soon as possible. With the large amount needed in a short time, it's hard to find another supply that can meet the requirement. This risk is unwanted for both the restaurant and the supplier. The way to mitigate this problem is to have safety stock or know few wholesale places in emergency circumstance. The price of food may be more expensive than the suppliers, but this price is much worth than the cost the restaurant may have to pay. Furthermore, the restaurant should ensure they have safety stock and can always buy missing and disqualified goods from supermarket and wholesale places. Another risk in the red dangerous zone is risk number 7, delayed delivery. Delayed delivery is one of the most terrible problems of the operation of the restaurant, the suggested solution for this risk is like the previous one that the restaurant should have safety stock and know few wholesale places for emergency.

The next risk in top important is risk in the flow of consistent food serving, risk number 17. In a buffet restaurant, the flow of food serving should never be interrupted; otherwise, if customers wait too long for a new batch of food, they may judge the profession and quality of the restaurant. In order to avoid this problem, well planned and prepared food is significant. A chef should monitor the kitchen closely and assures that the flow of food should not have any interruption.

The risks of damage in food quality during delivery once again is in the red zone. This problem occurs in two stages of the supply chain, delivery from suppliers to the restaurant and from the restaurant to customers, risk number 21. Many shippers use bikes and store the food in their backpacks. There is quite a high chance of the food being messed up since there is no proper container. It can also happen that shippers arrive late at the customer's place, due to traffic or weather condition. This leads to the bad quality of food when it reaches the customer's hands. This is a significant issue as a customer evaluates the restaurant based on the food quality no matter the fault in quality of food happened in the kitchen or during delivery. If it's not good, the restaurant may have bad reputation, even in the long-term. Therefore, the suggested solution here is to pay attention to the delivery team. Nevertheless, anything can happen even though the delivery team did their best. This risk is an accident and it will happen. The interviewee said that this risk is unavoidable but try to mitigate it as much as possible.

Another risk that is similar to risk number 20 is the bad quality of food served in the restaurant. This risk, however, can be avoided. Therefore, it should never happen in the restaurant. In fact, the interviewee said, the likelihood that happens is not high but because of the high level of severity, this risk is in top important.

Equipment plays an important role in the kitchen. What happened if they have problem as in risk number 14, it surely influences the operation of the restaurant. In Fuku restaurant, the fridge and the freezer are crucial to keep food from rotten and become bad. There is a slight chance of equipment problem, but this risk can still happen. The suggested solution is to fix when possible while the food can be put in cooler or heat preservation container to buy more time maximum one day for fixing the equipment. Otherwise, if it cannot be fixed, buy a new one immediately.

In Fuku, the seafood is used widely in most of their dishes. Therefore, there is a risk of contamination from raw food (risk number 10). This problem can result in a serious consequence about quality of food and soon it will be so bad for the restaurant. The suggested solution is that, raw material and cooked food should not be put in the same place. Two types of food must be at least on different desks, or in different rooms. The cooked food can also have some risks of being in bad taste, disqualified and contaminated (risk number 12). This should be mitigated as much as possible because like risk number 20, it's really important to make sure the food in restaurant is in good quality.

The last risk in the red zone is wrong quantity delivery, which is different in the amount ordered (risk number 2). The suggested solution for this risk is same as risk number 21 and 4.

Now, move to the next yellow zone. Risk number 5, bad quality product from suppliers should be returned back. The restaurant needs to talk and works with the suppliers to solve the problem. If the risk is repeated, then find a new supplier. In Fuku restaurant case, this kind of risk rarely happened. They have worked with the suppliers for a long time and their suppliers have stable flow of ingredient and goods. Most of the products from suppliers meet their requirement in quality.

Risk number 22, risk of wrong delivery to customers may influence the image of the restaurant. This happens sometimes, this risk has moderate consequence that can be accepted in the limit of times. Miscommunication problem (risk number 1) is usually underrated. In supply chain, where the accuracy and time matter the most, this is the most dangerous risk threatening the smoothness and effectiveness in the operation of the system. As the interviewee said, it happened quite often to the restaurant because of the missing emails which led to delayed orders.

Staff of the restaurant is the most important asset. For the image of the restaurant, staff needs to be well trained. They should have basic knowledge about safety standard (risk number 16), and hygiene (risk number 18) when they work in the restaurant. Otherwise, the restaurant may have troubles if staff does not follow the standards. If that risks happens, it may destroy the reputation of the restaurant.

The last two zones are the green and blue ones, including risks which have slight of occurring and low impact on the supply chain process of the restaurant. In some times of the year, the raw materials and ingredients become shortage (risk number 3). The food that run into shortage is usually vegetable because it depends on the season of the year. This risk is unavoidable and have minor effect. Therefore, it can be negligible. Suggested solution for this one is to flexibly change the menu based on the supply the restaurant has.

Sometimes, because of many variables, the price of raw material may go up and become unreasonable (risk number 6). In those cases, the restaurant can negotiate and rethink about the long-term relationship of suppliers. If it doesn't go well, the restaurant can move on and change the supplier. The amount surplus everyday can be a risk wasting money of the restaurant (risk number 13). The suggested solution here is to plan carefully the demand, the supply and not to waste the food as well as resources.

5 DISCUSSION

Risk Analysis is important to the operation of a restaurant. Restaurant manager needs to carry out the analysis to identify risks in the supply chain system. First of all, the manager has to understand how the system works, then notices risks in each stage of the material flow which make the flow less effective. Different restaurants have unlike criteria in risk analysis. Changes should be applied so that the analysis is more practical and suitable to the restaurants' own circumstances.

Each risk has its own solution as described in "Risk Analysis" section. However, there is a strategy to tackle risk group. As mentioned earlier, there are 2 factors to determine a risk. They are probability of occurring and the level of severity. There are two values for the likelihood of risk: rarely occurring and usually happening. The level of severity can also be divided into 2 groups: high level of impact and low level of impact. (table 4)

Table 4. Response Strategy

		LIKELIHOOD	
		Low	High
IMPACT	Low	I	II
	High	III	IV

Risk categorized in area I have slight chance of occurring and low level of impact. This type of risk can be ignorable as the risk causes non to minimum impact to the supply chain and rarely happens. The area II combined risks that have high chance of happening but low impact on the supply chain. As the risks occur usually, it means that the risk is part of the operation and the staff acknowledge that. Then, the solution for risk in area II is to accept it.

Risks in area III and IV are more difficult to cope with as they have high level of impact on the smoothness of the system. In area III, risks has serious consequences but less likely to happen. Therefore, the strategy for this type of risk should be to prevent it or to share through insurance either joint vendor or other arrangement. Plan the operation carefully

in advance and if there is something like risk in area III, it should be foreseen and prevented occurring. Lastly, risks in area IV have high chance of occurring and catastrophic consequences. The solution for this type of risk group should be to mitigate the consequences as much as possible with the preventing method .

Generally, there are four stages in the material flow of the restaurant. The first part that have most risks is buying raw material from suppliers. Most risks are about delivery and miscommunication which is in the information flow. The best solution for this stage is to have a safety stock to use product while waiting goods from the suppliers. Moreover, there should be a backup wholesale place in case of emergency.

Most risks in the next stage, *Storage*, are about contamination of raw product and cooked food. The main solution is to store those two in different places to not be mixed up. Equipment and tools are important in the kitchen. They should always be cleaned and well maintain in good condition.

The next part is Preparation and Cooking. The risks mention in this phase are mostly about the attitude of staff and their knowledge related to safety standard and hygiene. Well trained period is the suggested sollution for this type of risks.

6 RESEARCH CONCLUSION

In summary, the thesis answered two main questions in the beginning. The study covered literature review about supply chain and focused on the material flow. Besides, the thesis also included the risk management process in the theoretical framework, which has been implemented in the study.

Risk Identification part has answered the first research question. Likewise, *Risk Measurement* part and *Risk Analysis* not only answer the other question but also provide solutions for risk groups. The Discussion part provided strategy for different risk groups.

Supply chain is very important in the operation of a restaurant. Therefore, manager needs to know how the logistics process works, what risks are hidden in the flow and carries out risk analysis to improve the smoothness and effectiveness of the operation.

The author hopes the study could be helpful for those who is interested in restaurant management or would like to open a small restaurant, like the author.

REFERENCES

BC Campus Open Education. BC Open Textbooks. *Food Safety, Sanitation, and Personal Hygiene*. [Online] Available at: <https://opentextbc.ca/foodsafety/chapter/storage-temperatures-and-procedures/> [Accessed 30 May 2019].

Chartered Global Management Accountant (CGMA), (2013). *Enterprise Risk Management (ERM)*. [Online] Available at: <http://www.cgma.org/resources/tools/essential-tools/enterprise-risk-management.html?TestCookiesEnable,%20d=redirect> [Accessed 1 Dec. 2017].

Center for Innovation in Research and Teaching (CIRT). *Analyzing Qualitative Data*. [Online] Available at: https://cirt.gcu.edu/research/developmentresources/research_ready/qualitative/analyzing_data [Accessed 30 May 2019].

Center for Innovation in Research and Teaching (CIRT). *Qualitative Approach*. [Online] Available at https://cirt.gcu.edu/research/developmentresources/research_ready/qualitative/approaches [Accessed 30 May 2019].

Council of Supply Chain Management Professionals (CSCMP), (2013). *Supply Chain Management. Terms and Glossary*. [Online] Available at: https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921%5D [Accessed 28 Apr. 2018], p.186.

Damodaran, A. (2007). *Strategic Risk Taking: A Framework for Risk Management*. New York: PH Professional Business, p.1.

FUKU sushi restaurant, <https://www.fukuhelsinki.com/>.

Greenfacts.org. (2014). *Hazard, risk & safety – Understanding Risk Assessment, Management and Perception*. Available at: <https://www.youtube.com/watch?v=PZmNZi8bon8> [Accessed 1 Dec. 2017].

Health and Safety Executive, *Risk - Controlling the risks in the Workplace*. [Online] Available at: <http://www.hse.gov.uk/risk/controlling-risks.htm> [Accessed 30 May 2019].

Health and Safety Executive, *Decide who might be harmed and how*. [Online] Available at: <http://www.hse.gov.uk/risk/decide-who-might-be-harmed.htm> [Accessed 30 May 2019].

Health and Safety Executive, *Evaluate the risks*. [Online] Available at: <http://www.hse.gov.uk/risk/evaluate-the-risks.htm> [Accessed 30 May 2019].

Health and Safety Executive, *Record your significant findings*. [Online] Available at: <http://www.hse.gov.uk/risk/record-your-findings-and-implement-them.htm> [Accessed 30 May 2019].

Health and Safety Executive, *Review risk assessment and update if necessary*. [Online] Available at: <http://www.hse.gov.uk/risk/review-your-assessment.htm> [Accessed 30 May 2019].

Lu, L. Ti, D. (2014) *Supply Chain Management Risks in a sushi restaurant* [pdf]. Available at: <http://www.diva-portal.se/smash/get/diva2:698252/FULLTEXT01.pdf> [Accessed 19 Mar. 2019], p.37-38.

Logistiikan Maailma. *Information, Money and Material Flow*. [Online] Available at: <http://www.logistiikanmaailma.fi/en/logistics/logistics-and-supply-chain/information-money-and-material-flow/> [Accessed 30 May 2019].

National Institutes of Health Economics, *Risk Map*. [Online] Available at: <https://ehealthrisk.wikispaces.com/Risk+Map> [Accessed 1 Dec. 2017].

QualityGurus. (2013). *Introduction to Risk Management*. Available at: https://www.youtube.com/watch?v=Cp_XEhexcDw [Accessed 1 Dec. 2017].

Risk. (n.d.) In: *Business Dictionary* [Online] Springfield: WebFinance, Inc. Available at: <http://www.businessdictionary.com/definition/risk.html> [Accessed 1 Dec. 2017].

Risk Management Toolkit, *Probability of Occurrence*. [Online] Available at: <http://www2.mitre.org/work/sepo/toolkits/risk/StandardProcess/definitions/priority.html> [Accessed 1 Dec. 2017].

Supply Management. (2013). *How long should a procurement process take?*. [Online]. Available at: <https://www.cips.org/en/supply-management/opinion/2013/april/how-long-should-a-procurement-process-take/> [Accessed 27 Apr. 2019]

Unleashed. *Inventory Management vs. Warehouse Management*. [Online]. Available at: <https://www.unleashedsoftware.com/blog/inventory-vs-warehouse-management> [Accessed 30 May 2019]

Vaidya, D. *3 Types of Inventory. Raw Material. WIP. Finished Products*. WallStreetMojo. [Online] Available at: <https://www.wallstreetmojo.com/types-of-inventory/> [Accessed 30 May. 2019]

APPENDICES

1. Appendix A – Questionnaire for the interview of Fuku Sushi Restaurant
2. Appendix B – Interview transcript of Fuku Sushi Restaurant

APPENDIX A

QUESTIONNAIRE FOR THE INTERVIEW OF FUKU SUSHI RESTAURANT

As the interview carried out, questionnaire prepared for the interview is the following table. The author classifies the questions into topics: Risks related to Supplier, Equipment, Storage , Food preparing & Cooking, and Delivery.

Table 5. Questions in the interview

	No	Question
Supplier	1	How many suppliers in total does the restaurant have?
	2	What are the problems the restaurant usually has with the suppliers? Resources – raw material?
	3	Do you usually have the wrong quantity that is different from the amount you order? How often? From which supplier? What’s your solution? What’s their solution? Result?
	4	Do you usually face the lack of resources? (Ex: shortage of fish, cakes, vegetable, etc.) Which product that you lack of? How often? What’s your solution? Result?
	5	Do you usually experience the quality of the food is not like what you expected or sometimes, bad quality? Which product? How often? What do you think about the reason of it? (Because of the quality from the product or it is damaged during delivery?) What’s your solution? Result?
	6	About price, what do you think about the price of resources? Is there any product that you think it’s too much and its price is higher than value, you don’t satisfy with the price? Which product? How often? What ‘s your solution? Result?
	7	Sometimes, do the suppliers deliver not on time? How often? From which supplier? What’s your solution? What’s their solution? Result?

	8	Do they deliver with the wrong delivery, (it's less than the amount that you request or it's a different product from what you order) How often? From which supplier? What's your solution? What's their solution? Result?
	9	Do you usually face that resources are lost in delivery? How often? From which supplier? What's your solution? What's their solution? Result?
Equipment	1	How do you clean your tools? How can you make sure that it has been disinfected after use?
	2	What equipment do you have in your restaurant? Ex: refrigerator, dishwasher, freezer, what else?
	3	How often do you have problem with the equipment? What's damage caused by that? What's your solution? Result?
Storage	1	How do you store the raw resources? For how long? (Ex: raw salmon, meat, raw fish, prawn, shrimp, etc)
	2	How do you store normal food? For how long? (Ex: avocado, crabsticks, etc)
	3	Do you store finished food? Or you make food when receive demand from customer and deliver to customer right after that? Then what would you do with the overleft product that you make for a day
	4	How much is your junk food per day?
Food preparing & cooking	1	How does FUKU make sure the food served consistently during the buffet hour? Is there any cases that the kitchen cannot provide the food in time? If yes, how do you solve the problem?
	2	What are the safety standard of food preparing to avoid the risk of harming customers' health?
	3	How does Fuku monitor its kitchen service and food to ensure they are qualified?

	4	How often is there a mistake in the cooking technique? For example: overcook, undercook, seasoning mistake. How does Fuku handle these failed cooking dishes?
	5	How does Fuku prevent and handle kitchen accident?
Delivery	1	What do you think is the biggest risk in using delivery service for FUKU? Have FUKU ever thought of it/ have specific solution for it?
	2	Is there a risk of food not being in good condition when it reaches customers? What's your solution?
	3	How often is there a wrong delivery? What do you do to prevent and cope with it when it happens?

APPENDIX B

INTERVIEW TRANSCRIPT OF FUKU SUSHI RESTAURANT

As this is a Chinese restaurant and the manager does not speak English very well, the author carries out the interview in Chinese and summarizes the main ideas as followings:

Supplier

1. **Quantity:** Fuku has about 9 suppliers, which are chosen based on pricing and quality.
2. **Problem with supplier:** Missing emails which led to delayed orders. In order to prevent this situation, Fuku usually makes pre-order, so that there are always some days left for troubleshooting.
3. **Wrong quantity:** Yes. It is usually the seasonal vegetable, especially avocado. The supplier may not provide the quantity that they promised. In this case, Fuku will switch to another supplier or shop for the ingredient at the supermarket.
4. **Lack of resources:** Not really. The most shorted product is avocado. If it is hard to find the resource, they will go to the supermarket for the short-term solution.
5. **Disqualified food product:** Yes. If the food quality is still acceptable, Fuku still takes it but they inform the supplier. If the food quality is too bad, Fuku will return and usually they will get a discount from the supplier.
6. **Price of resources:** The price from the current suppliers is reasonable for Fuku. If the price is too high, Fuku will change the supplier. (Additional information: Fuku has two suppliers for a material, A and B. A's products are more expensive but the ordering process is easier. B's products are cheaper but the order process takes more time and effort)
7. **Delayed delivery:** Yes. But as noted above, Fuku usually makes pre-order, so that there are always some days left for troubleshooting.
8. **Wrong delivery:** Yes. Usually, the wrong delivered products will be returned to the suppliers with a complain. In case that the product is vegetable, Fuku will consider if they can use it in the near future. If yes, they will accept it.
9. **Lost resources:** No. Since the resources are delivered by the suppliers himself so it's not easy to be lost. Even it does, there is always safety stock.

Equipment

1. **Tools changing:** Few years for the knives and forks. But for the dishes and chopstick, Fuku has to refill it quite frequently since it is easy to be broken and lost.
2. **Equipment:** Refrigerator, freezer, dishwasher, small stove.
3. **Equipment problem:**
Fridge and freezer: Not often. Fix when possible. Otherwise, buy a new one. 3 fridges and 2 freezers → if one is broken, there is temporary storage for the food.
Dishwasher: Not often. Fuku has a deal with the dishwasher supplier that they will provide immediate repairing service when it is broken.

Storage

1. **Raw material storage:** Freezer. The material delivery is once a week. But new fish is delivered everyday.
2. **Normal food storage:** The avocado is stored with normal room temperature, it is delivered twice a week.
3. **Cooked food storage:** Food is used right after cooked and thrown away at the end of the day, therefore, no need to be stored. Only fruit and salad need storage.
4. **Throw away bad food:** Not often. Since the chefs will estimate the quantity of food when cooking, depending on the quantity of customers.

Food preparing

1. **Consistent food serving:** Based on experience. Also, there is always safety stock. In case the food is shorted due to the unexpected customer load, Fuku will ask the customer to wait for 5-10 minutes.
2. **Safety standard:** Finnish law → oivahymy.fi. Frequent equipment check, for example fridge temperature check.
3. **Monitor:** Fuku doesn't monitor, it mostly depends on the staff awareness.
4. **Cooking mistake:** Redo when necessary.
5. **Kitchen accident:** It is hard to prevent. The staff will be taken care when it happens.

Delivery

1. **Biggest risk in delivering sushi to customers:** The food's quality might be damaged due to delivering → losing reputation.

Fuku still uses delivery service because customers who have been to the restaurant, have the demand. It brings revenue so the risk is acceptable.

2. **Food delivery in bad condition:** Yes. There was a customer complained that there was bone in the salmon. Fuku gave him/her a gift card for compensation.

3. **Wrong delivery:** Whoever made the mistake, either Fuku or the delivery agent, takes responsibility. No, they don't have contract.

If wrong delivery is caused by Fuku: Fuku will re-deliver it for free.

