

**PRODUCTIVITY WITHOUT SACRIFICING TASTE:  
A CASE STUDY OF ROBOT INTERFACE IN SINGAPORE FAST FOOD  
RESTAURANT**

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## ABSTRAK

Tujuan penyelidikan ini adalah untuk mengenalpasti applikasi automasi robotik di sebuah restoran Cina yang berkonsepkan makanan segera di Singapura. Masalah kekurangan tenaga pekerja menjadi isu utama dalam sektor penyediaan makanan di Singapura. Matlamat utama kajian adalah mengenalpasti manfaat dan potensi automasi robotik dalam restoran dan bagaimana ia mampu meningkatkan tahap pengeluaran sekaligus mengurangkan tahap kebergantungan pada tenaga kerja. Sebuah restoran Cina berkonsepkan makanan segera, bernama Ruyi dipilih untuk mengenalpasti manfaat dan potensi penggunaan automasi robotik dalam penyediaan makanan sekaligus mengenalpasti isu-isu yang berkaitan automasi. Penggunaan kualiti robotik dalam penyediaan makanan dapat mengurangkan kos buruh dan meningkatkan tahap pengeluaran. Walaubagaimanapun, penyediaan makanan secara berautomasi didapati tidak memenuhi kehendak pelanggan restoran. Kajian ini menggunakan kaedah kes kajian bagi meneliti isu-isu berkaitan perantaraan robotik dalam penyediaan makanan. Kegagalan untuk menyediakan kualiti dan rasa makanan secara konsisten dikenalpasti sebagai penyebab utama isu reka bentuk kerja dan isu ketiadaan pemeriksaan kualiti. Alat analisa seperti Ishikawa, penanda aras, pelan tindakan perkhidmatan dan juga TOWS telah digunakan untuk menjawab persoalan kajian ini. Beberapa cadangan untuk mengatasi permasalahan kajian ini antaranya menggunakan applikasi robotik secara wajar untuk merekabentuk proses kerja tanpa mewujudkan apa-apa kemungkinan aduan pelanggan. Dengan menggunakan analisa penanda aras, isu-isu automasi dapat diperbaiki dengan mengikuti operasi restoran penanda aras. Kumpulan Tung Lok mampu mencapai tahap pengeluaran optima dan mengurangkan tenaga kerja selepas memasang separa automasi.

## ABSTRACT

The purpose of this research is to understand the application of robotic automation in a Chinese fast food restaurant in Singapore. Labor shortage is the key issue faced by Singapore food service sector. The objective of this study is to identify the potential benefits of robotic automation in restaurant and how it boosts the productivity by reducing reliance on manpower. In this study, Ruyi, a Chinese fast food restaurant has been chosen to examine the potential benefits of robotic wok for food preparation and the issues associated with the automation. The utilization of robotic wok was able to reduce the labor costs and hence raise the productivity. However, automated food preparation was unable to meet the preference of the customers. This research uses the case study method to examine the issue associated with robotic interface in the food preparation. Failure to deliver consistent quality and tasty foods was identified as the root cause of the issue as a result of inconsistent work design and the absence of quality check. Analysis tools such as Ishikawa, Benchmarking, Service blueprint and Tows analysis were used to answer research questions posted in the study. Recommendations were put forward for the identified issues. This study proposes the appropriate use of robotic machine to design the work process without creating any odds for customer complaints. Using the benchmarking analysis, existing issues with the automation issues can be improved by following the operation of benchmark restaurants. Tung Lok group was able to achieve productivity and reduce manpower after installing the semi automation.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

While analyzing customer feedback and report, Woody Achuthan, Vice President Operations Training and Customer Services of Tung Lok Restaurants (2000) Ltd has received a lot of customer complaints from Ruyi, one of the restaurants under the group in Changi Airport, Singapore. Ruyi restaurant have been using the semi automation to prepare dishes within a standardized time. Robotic wok is used to prepare the dishes such as fried rice and it was served to customers within a standardized time. However, customers are complaining about the food, as it fails to serve dishes with consistent taste. Through e-mail blogs and social media, he has received negative feedbacks and complaints about the food served in Ruyi. Being the president of Operations and responsible for customer service, it is the first time Woody has received such complaints from the customers and he saw a newspaper report highlighting the customer complaints about the food. The report says that the food served is not meeting the customer requirements. He was shocked to see a customer's feedback posted in complain, a blog, says that "On Ruyi's website where the restaurant's concept is explained, it states that Ruyi mean "As one's Wishes". Unfortunately, eating there is not what I would wish for". To stabilize the business, something has to be done in order to solve this problem since such complaints can create an adverse effect on the business operation. To find the cause behind the issue, he asks the outlet manager of Ruyi restaurant to report to him.

Woody has been serving as a trainer on customer service excellence, food and beverage presentation skills, onboard marketing, and product offering in United

Airlines before joining Tung Lok group in 2001. He was selected as employee of the year in 1988 and awarded with “Most valuable Player Corporate “and “Five Star Diamond” Awards.

Tung Lok Restaurants stand out as a successful player with its efforts to increase the productivity in the food and beverages industry. On the other hand they were sensitive to negative publicity concerned with customer complaints as it has a direct impact on the turnover and profits. When the food and beverage industries were struggling to sustain in the market due to the labor shortage, Tung Lok group stay competitive by introducing the robotic operation to consolidate the internal operations to achieve efficiency. And they were successful in achieving high productivity, as is clear from the financial statement of 2012, compared to the preceding years. As a result of incorporating robotic operation, Ruyi restaurant contributes a lot to up the productivity under the Tung Lok Group. Number of employees was reduced after implementing the robot and process was efficient compared to manual labor operation. For both the outlets, fourteen employees were reduced after implementing the robotization in the restaurant. Ruyi was seen as an example for boosting the productivity for other outlets in the food and beverages industry. Robotic wok was designed to cook the foods such as rice and noodles. It takes half the time as compared to chef to prepare foods. . Besides Ruyi, Tung Lok operates 13 other outlets in Singapore and 27 restaurants in Japan, China and India.

As Woody Achuthan realizes Ruyi is the main outlet for boosting the productivity, something needs to be done to retain the customers as now they are confronted with the customer complaints. He asks the outlet manager, Chanda Orio, to make an appointment with him to explain about the current situation of operation in Ruyi Restaurant. Chanda Orio, Assistant Manager, joined Ruyi under Tung Lok group in 2011. She is responsible in supervising the operation the restaurant. Ruyi is considered as the main target for Tung Lok as it is funded for the operations from SPRING (Standards, Productivity and Innovation Board) Singapore. SPRING is a

government authorized agency aiming at growth and development of Singapore enterprises. It provides services in the areas of finance, technology, Management development and market access. As a National standards and accreditation body, it ensures the safety of general consumer goods in Singapore and aims at building trust in Singapore's goods and services. Several other restaurants under the group have initiated to implement the innovation in their operation; ruyi was the first to introduce such automated process in its kitchen. Ruyi is being funded from this government agency as they anticipate that encouraging the current business operation in Ruyi can augment the productivity now and in the future.

Chanda Orio is inquired to study about the cause of the customer complaints and to submit a report to the Woody Achuthan with seven day's time. Failure to submit the real cause of the problem will end up with her resignation from the current job hence she was forced to sort out the issue. While analyzing the operations, certain issues had drawn her attention. Since the restaurant operates 24 hours a day, they have to employ the workers in three shifts. They employ foreign workers from China and Malaysia. The working style of each employee was different in different shifts, resulted in inconsistent taste of food. Since they prepare instant food for the customers they failed to follow the same procedure for preparing the food and customers were not satisfied with the taste. For example, some customers were complaining that the fried rice tasted like plastic and was very hard to chew. Customers were looking for affordable food with high-satisfied taste and quality. The customer's review in the social websites and blog such as Openrice Singapore, a restaurant review blog, would create a negative perception about the food will tend to reduce the customers influx to the restaurant.

At the same time, Chanda, after having a close supervision of the operation discovered that the employees are having some issues with the working environment. Kitchen area is quite small and wearing thick uniform cloth, employees find it very hard to work continuously in the hot environment. As such, it creates physical weakness and hence unable to maintain consistency in the work pattern. It is crucial for any restaurant to reduce complaints about the dishes as it impacts customer satisfaction. In this case, the manager and customer service vice president have to come out with a solution to solve the current issue. As it is being spread through all the media, much care and attention should be given towards the issue. The innovative machines like, robotic wok aid in increasing the productivity and profit. On the other side, failures in the working style of employees have made some adverse effects over the food being prepared. Skillful mindset of manger or vice president can balance the issue by keeping the productivity high with reduced customer complaints about the food. But the question still remains –how can they do it?

## **1.2 Case Issue**

Ruyi Restaurant is a one out of 40 restaurants under Tung Lok group. Understanding the current customer trends, they serve Chinese fast food with affordable price. When restaurant industry faced the labor shortage, resulting in low productivity, Tung Lok installed semi-automated operation to overcome the issue. As a result, they implemented semi automation in Ruyi, leading to increased work flexibility, service level has been improved and productivity level went up with lower number of workers. It takes half the time to prepare foods by the robotic wok as compared to manual labors. Customers are served with a standardized food with

reduced waiting time. As a result of incorporating semi automation, service productivity has been increased. However, human intervention is necessary to operate the robotic wok for certain food varieties and as well as in adding the ingredients and toppings.

Located at Airport, Ruyi operates 24 hours a day and it serves more than 30 dishes with some kind of beverages. The main dishes like fried rice and noodles are being prepared with the help of robotic wok. Working in three shifts, morning, evening, and night, each employee works around eight hours and operates the robotic wok for preparing the foods. Chicken, pork, sauce and vegetables are delivered from headquarter, Bukit Batok central kitchen in standardized quantity before prior to the business operation every day. The delivery of raw materials and ingredients for the restaurant is being delivered to ensure the pace of operation is enhanced thereby saving the time. Consolidating the process of preparing food items ensured instant serving of the food and hence the use of semi automated machines increase the pace of preparing dishes like shrimp, noodles etc. The employees were able to reduce the intensity of the work involved with the aid of automated machines. Since it is operating 24 hours a day; three shifts were assigned for the employees. Hence the methods and procedures for preparing the food vary in each shift such as adding ingredients and toppings for the dish. Therefore, complaints have been raised by the customers regarding the taste and quality of the dishes served. Such dissatisfaction among the patrons will tend to affect the traffic in the restaurant and hence affect sales and productivity. When the restaurant is not able to concentrate on solving the issues associated with the core products, chances are high to bring decrease the sales. As a result, the core focus of augmenting the productivity will be hindered by customer dissatisfaction about the taste.



### **1.3 Research Questions**

1. How effective has decision of Tung Lok group in employing semi-automated robot to overcome labor shortage in food services sector in Singapore?
2. What are the root causes of customer complaints in Ruyi Chinese fast food restaurant?
3. How can productivity be improved without sacrificing the taste by employing semi-automated robot in Ruyi Chinese fast food restaurant?
4. What issues should Chanda Orio be considering in her decision as an outlet manager to solve taste and quality complaints in Ruyi Restaurant?
5. How would Chanda Orio handle the service design of semi automated robot and mass produced ingredients to consolidate some process to attract customers?

### **1.4 Problem Statement**

The vibrancy of the food and service industry has a major role in empowering the economy of Singapore. With 5,900 food service establishments including restaurants, cafes/coffee houses/snack bars, food courts/coffee shops/eating houses, fast food restaurants and food caterers employed with 82,600 workers, the service sector was not so productive in recent years. According to the Department of statistics (2009), the value added per worker in the food service sector amounted to \$ 22,300; one-third of the national average. Labor issue is one of the major challenges underpinning the productivity in Singapore food service industry. Food and service operations need high reliance on manpower and the maintenance costs for the labor tend to be increasing every year. Tax levied on foreign employees, wage increase,

training costs, which are calculated under the labor turnover costs. The labor issue has been eradicated to an extent by some efforts of the industry and the government. Technology Innovation and consolidation of internal operations are some of the attempts made by the executives to overcome the labor issue, thereby achieving the productivity.

Restaurant owners are unable to raise the profit margin as a result of high labor costs. Moreover the rising labor costs made it difficult for the operators to boost sales by providing promotions and discounts. As such, labor cost is the prime issue that hinders the company to achieve profitability (Min, 2014). Reducing labor costs with the aim of increasing sales is the concern for every food service industry. When labor cost reduction is given much attention, productivity can be achieved for a shorter period, but jeopardize the long-term viability due to the absence of service standards. According to Kimes (2001) poor service affects customer satisfaction, results in poor sales and productivity.

The food service industry in Singapore strives against the labor shortage by leveraging on technology and introduction of technology. Technological advancement embraces the use of automated machines and centralized operation to achieve cost savings in terms of time and labor. Moreover, time savings positively enhanced the customer service.

Tung Lok Group embraces the use of automated technology in their centralized kitchen as well as in restaurants which are operating under them. As such, they were able to gain productivity gains since machine operation require few employees. For instance, more than 75 products are being prepared in Tung Lok central kitchen, made it more economical to invest in automation. As such, respective

outlets under the group could achieve simplified food preparation and less labor intensive. In addition, the automated cooking methods achieved economies of scale and escalated productivity. Artificial Intelligence cooking machines installed in the central kitchen of Tunglok, which automate, standardize and increase productivity (Wen, 2013).

## **1.5 Organization of Thesis**

The rest of the thesis is organized as follows. Next chapter explains about the country analysis, focusing on the Political, Economical, Social, Technological, Environmental and Legal Environment of Singapore economy. Chapter three explains the profile of restaurant industry. In chapter four, profile of the company has been explained. Chapter five explains the related literature of this study, stressing more on robots, concepts and its contribution in food and beverage industry. Chapter six focus on methodology of the study, explaining about the Qualitative case study research and data collection methods. Following chapter explains the case write up, illustrating the company performance, competitive strengths and sales. Chapter eight explains the case analysis in this study, describing the analysis tools used. Final chapter explain about the recommendation and conclusion.

## **CHAPTER TWO**

### **COUNTRY ANALYSIS**

#### **2.1 Introduction**

This chapter provides an overview about the economy of Singapore to highlight the business environment surrounded with. The characteristics of the economy are highlighted in this chapter embracing the economic features, growth and business environment. However, the study about the economy provides a link for the organization chosen and the industry involved. The following section provides an overview about the country using PESTEL analysis.

#### **2.2 Overview of Singapore**

According to Abeysinghe (2007), to compare what Singapore is today and what it was 40 years ago, can be described as “a wonder created out of a tear drop”. The country was transformed into a world renowned economy with its relentless efforts to fight against all odds.

Singapore has been widely acknowledged as having one of the best business environments in the world, as well as a high income economy in south East Asian pacific. Being one of the smallest countries in Asia, it spans an area about 710 square kilometers. The country is quite famous for its vibrant economy, harmonious blend of culture, landscape and high rise buildings. It has been forecasted that the economy of the country is expected to reach \$342 billion by 2018 (Amalguer, 2013). Primarily, growth of economy of Singapore is driven by domestic and external demand, investments and private consumption expenditures. The majority of the economy is dominated by the petroleum refining and the pharmaceutical industry,

which raised the potential to attract investments from the rest of the globe.

However, being the high per capita income country across Association of Southeast Asian Nations (ASEAN), and located on the cross roads on major air and sea routes, trade relation was easy with the other countries and as well made it as headquarter for number of international food and agricultural related companies. Moreover, it ranks high as a business friendly economy with low rate of corruption and high government efficiency. With the presence of more than 7000 MNCs, it is an attractive and competitive spot for manufacturing of products, possessing world class capabilities in design and development of global products (Hsu, 2012). Moreover, Singapore has been ranked as the top country as the major investment destination in the globe. Moreover, the country creates a favorable operating environment for business with its unique geographical condition, stable political environment for foreign trade investment. Hence it forms a strong base for the multinational companies to evolve into the country. In addition, the strong legal system and attractive tax system makes it more liable for business environment.

### **2.3 PESTEL Analysis**

PESTEL analysis is a widely-used tool that helps to analyze the political Economic, Socio-Cultural and Technological situation of an economy. The analysis will help to obtain a deeper understanding the overview of the business operations as well as the threats and opportunities associated with.

### **2.3.1 Political / Legal Environment**

Singapore, officially known as the republic of Singapore was formed in 1819 and gained independence from British rule in 1963 as part of federation of Malaya followed by separation from Malaysia in 1965. Being parliamentary republic, the political system of the country is centered on democracy. Prime minister and the cabinet lead the parliamentary-style government, who represents the majority. The Executive, the Legislative and the Judiciary are the three main organs of the constitution. The executive directs the government with the cabinet, Legislative organ for endorsing legislation and Judiciary administer justice which is guaranteed by the Constitution of Singapore

The main political parties include People's Action party, workers party and national solidarity party. The people's action party has been dominating the political process of the government since the independence from leaving Malaysia. Though Singapore is considered as the mixture of democracy and bureaucratic, sometimes it considered as social democratic that rely on policies and law making process instead of government rule. The country is composed of multi racial and multi religious character, though it has ensured fair treatment to all races in education, housing and health. Although Singapore has the best political and regulatory environment in the world, according to global information technology report 2011, it ranks 122 for the freedom of press out of 138 countries in the world (Nag, 2011).

#### **2.3.1.1 Regulation Structure**

Regulation structure directs policies to foster the business operations in a systematic way. Government agencies such as Ministry of Trade and Industry (MTI)

and Standards Productivity and Innovation Board (SPRING) enhance the trade and related activities.

**a) Ministry of Trade and Industry (MTI)**

The Ministry of Trade and Industry aims at transforming the nation into a global leading city of talent, education and enterprise. Moreover, it enhances the economic growth, expands trade, develops industries and creates more opportunities for jobs in order to achieve premium standard of living.

**b) SPRING (Standards Productivity and Innovation Board)**

SPRING is an enterprise agency under Ministry of Trade and Industry to promote growth of enterprise sector and developing small and medium enterprises. It promotes the SME sector by involving partners for providing financial assistance, technology and innovation, capabilities and management development. The mission of SPRING aims at developing the enterprises and to build trust in Singapore goods and services. The main targeted areas by this statutory board are productivity and innovation; standards and quality; and development programme for small and medium-sized enterprises (SMEs) and the domestic sector. The organizational structure of SPRING is headed by the Chairman and assisted by the Chief Executive Officer. It is further organized into the following units.

- Productivity & Innovation
- Standards & Quality;
- SMEs and Domestic Sector;
- Promotion and Corporate Affairs;
- Planning and Corporate Development

- **Incentives Management**

The main strategy of SPRING is to boost productivity in the food services sector. Restaurants which is in surge of incorporating automation and technology is being funded by this statutory board. It provides grant to support the operation of the restaurants such as automation and workflow redesign. Moreover, SPRING has supported more than 25 companies with a total fund of \$2.6 million for such innovation and technology adoption. The rationale for the funding was to uplift the operational level thereby enhancing the productivity (Spring, 2012).

### **2.3.2 Economic environment**

Singapore's economy has undergone remarkable economic development since independence. The country is famous for its strong economy, which paved the way for development in all the business sectors. The exports have changed from labor intensive to high value products such as electronics, chemicals and biomedical. Moreover the growth of financial services and other service sectors witnessed a huge growth that intensified the growth level of service sectors.

In 2013, the GDP growth rose to 6.1 percent in the fourth quarter of 2013, which was 0.3 percent in the preceding quarter of the same year (Monetary Authority of Singapore, 2014). According to the economic review, 2013, GDP of the economy equals SG \$326.7 billion and it ranks third highest per capita GDP in the world.



### *2.3.2.1 Productivity*

Productivity can be defined as the value of output produced by certain unit of labor during a particular time. It indicates the efficiency of an economy. According to statistics Singapore productivity has been increased in fourth quarter of 2013 when compared to the preceding quarter of the same year (Ministry of Trade and Industry, 2013)

According to economic survey of Singapore (2013), finance and insurance shows the highest growth percentage (15 percent), followed with Construction (7.3 percent), Business Services (4.3 percent), Information & Communication (2.9 percent) and Accommodation & Food (2.1 percent). Moreover, the total demand contracted as a result of decline in external demand, where as domestic demand was raised to 5.8 percent in the fourth quarter of 2013. The employment growth showed a high growth percentage and unemployment rate was slightly increased from 1.8 percent in 2012 to 1.9 percent in 2013. While analyzing the productivity, only finance and insurance sector raise the growth level by 6.5 percent with Information and communication sector with a little growth (1.3 percent). The Gross domestic product of each sector between 2010 and 2014 has been shown in the figure below. According to the Monetary Authority of Singapore (2013), Singapore achieved the following:

- Open economy for international trade and investment (Rank 1)
- Easiest place in the world to do business
- One of the most competitive countries in the world
- superlative business environment in Asia pacific and around the world

Industry	2010	2011P	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4
At Current market Prices								
GDP at Current market Prices	310,036.5	326,832.4	77,435.4	81,066.3	81,558.7	80,146.7	81,002.9	84,124.1
Goods Producing Industries	81,576.4	81,684.5	20,271.6	20,534.2	20,246.8	19,731.1	20,674.7	21,032.0
Manufacturing	64,459.8	64,198.0	16,014.7	16,144.3	16,000.9	15,343.0	16,254.1	16,600.0
Construction	12,610.6	12,759.0	3,118.7	3,210.4	3,150.1	3,104.8	3,202.1	3,302.0
Utilities	4,104.8	4,624.6	1,113.7	1,152.2	1,067.9	1,257.5	1,195.0	1,104.2
Other Goods Industries	102.2	102.9	24.5	27.3	27.9	25.7	23.5	25.8
Service Producing Industries	199,015.0	211,877.9	49,652.1	52,796.3	53,333.4	51,936.1	51,979.1	54,629.3
Wholesale & Retail Trade	52,264.6	53,328.3	12,991.1	13,615.6	13,102.9	13,418.4	12,805.0	14,002.0
Transportation and Storage	25,191.9	25,169.3	6,321.3	6,697.7	6,191.5	6,268.9	6,143.3	6,565.8
Accommodation & Food Service	6,447.3	7,300.4	1,648.1	1,686.2	1,762.5	1,809.1	1,861.4	1,867.4
Information & Communication	10,650.0	11,013.7	2,632.2	2,749.4	2,754.2	2,742.1	2,712.6	2,804.8
Finance & Insurance	33,469.1	36,688.5	8,283.0	8,955.7	9,189.6	9,030.0	9,327.3	9,141.6
Business Services	39,885.4	43,390.2	10,087.2	10,416.3	10,621.4	10,692.4	10,558.9	11,217.9
Other services Industries	31,106.7	34,987.3	7,689.2	8,675.4	9,711.3	7,975.6	8,270.6	9,029.8
Ownership of Dwellings	11,579.3	13,495.8	2,897.4	3,070.5	3,225.2	3,364.6	3,432.0	3,474.0
Gross Value Added At Basic Prices	292,170.7	307,058.2	72,821.1	76,401.0	76,805.4	75,031.7	76,085.8	79,135.3
Add: Taxes	17,866.1	19,774.2	4,617.3	4,665.3	4,753.3	5,115.0	4,917.1	4,988.8

**Figure: 2.1 Gross Domestic Product by Industry**  
*Source: Singapore Department of Statistics*

As noted earlier, due to its business friendly environment and strong economic conditions international trade is strongly influenced in the economy. According to economy watch 2010, Singapore ranks 14<sup>th</sup> largest exporter and 15<sup>th</sup> largest importer in the world. More over it has the highest trade to GDP ratio of 407.9 percent in the world (World Trade Organization, 2010). The total value of exports amounts US\$351.2 billion and total value of imports amounts US\$310.4 billion (Economy Watch, 2010)

The main components of primary exports include machinery and equipment, consumer goods, pharmaceuticals and other chemicals. The main partners of primary

exports are Hong Kong (11.6 percent of total exports), Malaysia (11.5 percent), US (11.2 percent), Indonesia (9.7 percent), China (9.7 percent) and Japan (4.6 percent). Importing goods mainly comprises of machinery and equipment, mineral fuels, chemicals, food stuffs and consumer goods. The main partners of the importers are US (14.7 percent), Malaysia (11.6 percent), China (10.5 percent), Japan (7.6 percent), Indonesia (5.8 percent), and South Korea (5.7 percent). Prominently, the trade relations are prioritized towards World trade Organization and Doha Development Round. Moreover, the country maintains numerous regional free trade agreements with other nations. The regional free trade agreements includes ASEAN Free Trade Area (AFTA), the ASEAN-Australian-New Zealand FTA (AANZFTA), the ASEAN-China FTA (ACFTA), the ASEAN –India FTA (AIFTA), the ASEAN-Japan Comprehensive Economic Partner (AJCEP), and the ASEAN-Korea FTA (AKFTA) and others multi lateral agreements with Switzerland, Liechtenstein, Norway, Iceland (Singapore Europe Free Trade Association), the Gulf cooperation council Singapore FTA (GSFTA).

The inflation rate has declined from 2.6 percent during the first quarter of 2013 to 1.5 percent in the final quarter of the same year. It has been discovered that the falling rate of inflation was the result of decline in the private road transport cost. The inflation rate in the country averaged 2.81 percent from 1962 till 2014 (Trading Economics, 2014). According to the latest data on Trading Economics, the accommodation cost rose to 3.3 percent, food inflation to 2.7 percent where as service inflation was stable at 2.85 at the end of December 2013. However the inflation rate was 0.40 percent during the first quarter of 2014. The fiscal and monetary policies are designed to attract foreign investments, with reduced tax rates. The prevailing tax rate for corporate business is around 17 percent. According to the

economic index freedom of 2014, Singapore's economic freedom score reached 89.4, down from 88 points in 2013. The economy is recorded as the second freest economy in the world. The efficient government and high level of trade freedom ensured the continuous economic growth and ensured global competitiveness. Moreover the banking system in Singapore is the strongest in the world and it possesses the fourth largest foreign exchange market in the world.

### **2.3.3 Social Environment of Singapore**

Singapore is well known for its multi racial society with its diverse cultures. Being the small country, it is one of the best countries to live in with a high standard of living. Though the culture is blend of different racial, business etiquettes and relationship values are given much significance.

#### ***2.3.3.1 Population***

The ethnic population of the Singapore includes Chinese (74.2 percent), Malay (13.3 percent), Indian (9.1 percent) and others constitutes 3.3 percent (Kim, 2013) and the growth has been declining in the recent years. It is recorded as the most densely populated country in the world with 6,430 people per square kilometer. The total population of Singapore covers about 5.18 million, out of which foreigners (workers, long term visitors,) constitutes about 1.39 million. The total population of Singapore constitutes 0.08 percent of the world's population. Foreigners were also decreased due to high restriction of jobs and government policies (Singapore Department of statistics, 2013). Moreover the rate of aged population shows a growth when compared between the preceding years (7.8 percent in 2012 to 11.7 in 2013). According to Ministry of manpower Singapore, The rate of employed persons increased from 3358.10 to in 2012 to 3492.50 thousand in 2013.

### **2.3.3.2 Education**

English has been used as the primary language for Singaporeans. However Chinese is widely used which enhanced the business international business relation with Hong Kong Taiwan and China. The government provides strong encouragement for maintaining a sound education system that enhances the nation to be a knowledge intensive economy, creating more demands for talent and intellectual population. Universities in Singapore are strongly supported by the government that made the country as an attractive destination for expatriates seeking well educated workforce (Bloomberg Business week, 2014). Universities in Singapore have gained wide recognition and listed in top rank list at global level. Mainly, there are six public leading universities - national university of Singapore, National Technological University, Singapore Management University, Singapore Institute of Management, Singapore Institute of Technology and Singapore University of Technology and design. Moreover there are some private leading universities as well.

### **2.3.4 Technology**

Singapore encourages the use of innovative culture irrespective of sectors. It maintains an established connection with the rest of the countries with well equipped airlines and ports. However, the country depends in the imports of energy supply used for transport, power and industrial purposes. According to Bloomberg (2014), Singapore ranks seventh position as an innovative country in the world. IT infrastructure has been considered as the competitive edge for the development of economy Mahizhnan (1999). Moreover, the encouragement of government to

introduce appropriate infrastructure is inevitable. Singapore ranked as the best site for telecommunication sector even before the cascade of Information technology demands Mahizhnan (1999). When looking at the IT education, the country is has launched advanced strategies in the early 1967s. The ministry of education introduced IT education for all the students to retain the knowledge as well as to create skilled human resources for the nation.

According to Lee (2011), *“Singapore shows its strongest performance in the Input Sub-Index, coming in at 1st place on the basis of its strengths in the Institutions (9th), Human capital and research (1st), Infrastructure (9th), Market sophistication (2nd), and Business sophistication (1st) pillars. However, Singapore’s Innovation Efficiency Index ranking is low (37th among high-income countries, 94th in the general rankings); this shows up in its relative weak performance in the Output Sub-Index, where it is ranked 17th overall (Scientific outputs at 17th place and Creative outputs at 33rd). Singapore is ranked 41st in patent applications at the national office, 82nd in national office trademark applications, and 82nd in creative services exports”* (Global Innovation Index, 2011).

Though the rest of the industries are making the best use of technology, the food industry is less prone to technological implementation in Singapore. Food service industry has embraced technology to a certain level, still creating issues to raise the productivity. SPRING (Standards Productivity and Innovation Board) is encouraging companies to adopt new technological applications such as wireless to enhance the service performance. Moreover, several technologies are encouraged to adapt to the industry to enhance the growth level. Implementation of Information technology will enable the companies to increase the demand and maintain relationship with suppliers.

## **CHAPTER 3**

### **INDUSTRY PROFILE**

#### **3.1 Introduction**

The vibrancy of the food and beverage (F&B) industry in Singapore support internationalism and multi-ethnic flavour of the economy. The industry embraces all types of food services and drinking establishments – from inexpensive cafeterias and fast-food joints to fine-dining restaurants, as well as pubs, bars and nightspots. Moreover, the vibrancy of the sector made Singapore a leading gastronomic and shopping capital in Asia Pacific. F&B services industry in Singapore comprises 5,900 establishments, generated about SG\$5.6 billion in sales. Restaurant covers 36 percent of the total establishments in Singapore, with 6.6 percent fast food outlets, 5.2 percent food caterers and the rest is composed by other establishments (Kim, 2008). Full service restaurants experienced sales growth and achieved sales of SG\$1.7 billion in 2011 and are expected to reach SG\$2.2 billion by 2016 whereas self service cafeterias are expected to reach SG\$14.2 billion in 2016 as it was 11.8 million in 2011 (Market Indicator report, 2012)

The industry employs about 82,600 workers or 4.8 percent of the overall services workforce, and its performance is closely tied to consumer confidence and spending. The strong economic conditions and the entry of many new F&B concepts have attracted more customers and have increased the traffic. The strong economic condition is not influenced by the local population alone, tourists that flock into the country is a major contribution for the economic development. It is estimated that Singaporeans spend about US\$5 billion annually eating out. Restaurants as a group account for 37 percent, while fast food outlets account for 13 percent of the total

revenue in the food & beverage services industry. Food caterers take up a 12 percent share of the food and beverage industry. The others Category consisting of cafes, coffee houses, food courts, coffee shops and eating houses take up 38 percent of the total (Services Survey Series, 2012).

Together with Hong Kong and Australia, Singapore is ranked as one of the major eating capitals in the Asia Pacific region. (Spring Singapore, 2014) The food and beverages industry of the economy has contributed approximately 3.5 percent to the total GDP of the nation. Moreover it stands out as the foremost in food consumption levels in South East Asia on the per capita basis contributing to about 3 percent of GDP.

### 3.2 Food and Beverage statistics

The sound performance of the food and beverage sector raised \$7,836 million operating receipts in 2012. In addition the operating receipts per establishment rose 4.8 percent in 2012. The statistics of the food and beverage from the year 2007-2011 is shown (Table 3.1).

**Table: 3. 1 Food and Beverage Statistics**

Indicators	Year				
	2007	2008	2009	2010	2011
No. of Establishments	5,286	5,854	5969	6180	6140
Operating Receipts (\$b)	5.1	5.6	5.6	5.4	7.2
Value-added (\$b)	1.8	1.9	2.0	2.2	2.5
GDP Contribution (%)	0.7	0.8	0.8	0.8	0.8

*Source: Department of Statistics: Spring Singapore*