

Chapter 91

Robotic Transformation and its Business Applications in Food Industry

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ABSTRACT

The role of robots is becoming substantial for industrial applications and business competitiveness. The robot transformation in food industry has increased business productivity, reduced cost and enhanced customer experiences. The usage scale of robots has an increasing trend globally when industries modernize and increase the production capacities with ability in handling complex tasks. The objective of this chapter is to explore robotic transformation in literature and to investigate its business applications in food industry. There are two points raised in the discussion, would the robot technology which has been developed only capable owned by large scale food companies and the experiences gained in the restaurant which serves by robots can replace the human touch. At the end of this chapter, some solutions are given to shed light on the application of robot in food industry and deepen critical analysis for researchers, technocrats and business practitioners.

1. INTRODUCTION

In the modern competitive business the role of robots is becoming significant for industrial applications. The important factor for using robots in the industry aims at reducing human inference and to increase the productivity. According to Chiu-Chi (1995), the shortage of manpower led Taiwan industry to use more robots and it enhanced the annual growth rate of robots globally. Chiu-Chi (1995) also states that the robotic research have expanded the domestic industry, promoted the technological standard and the development of the small and medium manufacturers. The robot transformation in service sector has significantly increased business productivity and customer experiences.

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Manshi and Shukla (2012) analyzed the market growth of industrial and service robots, mainly involving the growth of the two categories of robots in 21st century. The growth of service robots seems to be higher since they own a huge market share, out of which personal robots contributing the major share of growth. Manshi and Shukla (2012) compared the growth of robots in the industry in terms of sales and volume. The growth of service robots showed a higher percentage than the industrial robots depending on the areas of application. Manshi and Shukla (2012) concluded that the technological transformation and the huge requirement in various industries have raised the need for robots at a big scale there by developing the robotics industry during the early 21st century.

Robots are used in promoting product quality and reducing costs (Chiu-Chi, 1995). According to Gorle and Clive (2011) reported that there is a great potential for new job creation in the years up to 2016. According to Moran (2011) Shenzhen –Foxconn, the largest manufacturers of Apple products plan to replace workers with nearly one million robots in recent years. Low cost maintenance with high productivity in the business is considered as the prime advantage for the robots. Baxter, a new inexpensive robot is an example, which provides user friendly operations and performs various tasks in small manufacturing companies (Ben, 2012).

When looking into the food industry, the robots serve for much purpose, mainly in production systems for material handling and packaging operations (Wallin, 1997). The evolution of robotic applications in food industry evolved in 1980s and the growth was not effective due to high technology related costs. After realizing the consistency of robotic jobs, with improved efficiency and reduced work space, food industry expanded the use of robots for various applications which resulted in high productivity.

Although the investment required in the robotics was an obstacle to the development of the robotic application, Rene et al. (2010) outlined the design feature for low cost robots for the production in the food industry. Robots should fulfill the basic requirements like hygiene, speed and safety, cost, operational speed and ease of programming (Rene et al. 2010). Rene et al (2010) also suggested that low cost robots in the food industry will pose developments in the industry with reduced costs for the production. The objective of this chapter is to explore robotic transformation in literature and to investigate its business applications in food industry. This is can be seen than many restaurants have extended robot applications to increase business productivity, keep the loyal ones and to attract new customers.

2. LITERATURE REVIEW

A robot is an electro mechanical machine operated with the computer manipulating various functions. According to International Standard Organization (1997), a robot can be automatically controlled, re-programmable multipurpose manipulator programmable in three or more directions. Basically robots can be categorized on the basis of degree of autonomy, industry or field where they are used and goals they are fulfilled. On the basis of degree of autonomy, it can be categorized as stationery, ground, underwater, and aerial. Robots under the category of goals fulfillment includes contest, personal enrichment, manufacturing and entertainment.

Based on the industry, robots can be divided into categories- Industrial, service and military robots, agricultural, mobile and telerobots. Engelberger integrated the first industrial Robot (Unimate) in 1962 at New Jersey General Motor's automobile factory. It was an automated die-casting mold, used to avoid human interference in holding car parts made of molten steel. Handling hazardous job is one of the most advantages of robots in the industry. The success of the first industrial robot, Unimate, shed light on the

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