Using Pattern Recognition in Decoding Hazard Analysis and Critical Control Points (HACCP) for Quality Assurance:
The Case for a Start-up Company

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EXECUTIVE SUMMARY

Jack Grealish is an aspiring entrepreneur. During his undergraduate in UCLA, he worked in his father's business, which focused on selling specialized foods. He became fascinated with the food industry and find out more what it entails. His investigation has unveiled the landscape of the food industry. Furthermore, he discovered that the hazard analysis and critical control points (HACCP) system implemented in the food industry was rather disjointed and could benefit from automation. He conducted a preliminary research about current HACCP development and determine to plunge ahead. Jack ponders about the possibility of integrating different pattern recognition methodologies in HACCP processes to improve the effectiveness of overall quality control at his company.

Keywords: Hazard Analysis and Critical Control Points (HACCP), Quality Assurance

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ORGANIZATION BACKGROUND

Jack Grealish is a student who studies mathematics at the University of California, Los Angeles. His father, Tom Grealish, who owns a small ethnic food store in East Los Angeles, an urban region within Los Angeles which is a young and bustling neighborhood. Tom sells premade food from his home country, Ireland, along with food from other neighboring regions: England, Scotland, Wales, and Northern Island. Tom carries a variety of products, both imported and locally made. Jack, who is fascinated by his father's passion about food, has developed an interest in working for the food industry using his mathematics skills.

Jack spends summer in helping his father with the store. By helping his dad, Jack came to know a lot about the food industry and how a variety of regulations impact the industry. As a retail store, Jack and his father have an ability to purchase directly from the private labelers. In addition, they can purchase through the distributors, who hold products from different labelers. The prominent food distributors supplying in their geographical area are, US Foods Service, Sysco, and Gold Star.

For his understanding, Jack wanted to put together a depiction of the food production landscape. As shown in the Figure 1, the process starts with the raw material producers, primarily in agriculture. Slaughterhouses are the main sources for processing the meat and poultry products while produce would be processed through various processing facilities. The materials are then distributed to various channels using the distributors: food manufacturers, wholesalers, and retailers. The national and regional manufacturers are wholesalers who have buying power and can negotiate directly with the raw material producers. Occasionally, retailers might enter a negotiation for better prices, cutting out the distributors. The manufacturers gather raw materials from the producers as well as procure other materials in the market. They produce products which function as a raw material for another product or they can manufacture finished products which would be shipped for consumption. The wholesalers usually aggregate a large variety of products that they display for retailers. The retailers may buy in bulk from the distributors or wholesalers and sell it to the end consumers.

The food industry is under regulation of two separate entities: the Unites States Department of Agriculture (USDA) and the Food and Drug Administration (FDA). While the USDA handles poultry, meat, and shell eggs, the FDA handles seafood, vegetables, soft drinks, and other non-meat products. The USDA has a dedicated inspection service called the Federal Safety and Inspection Service (FSIS) that oversees the processing under their jurisdiction.

Industry Background

According to the Bureau of Labor Statistics (2012), an annual consumer spends roughly 12.8% on food, equating to approximately $130 per week. The food industry growth averages to approximately 2.0%. In 2012, the canned food market reached $11.7 billion on a production of 2.98 million tons of product (Market line 2013a). In the same period, chilled and deli food market grew 1.4% with a value of $0.16 billion and a production of approximately 23 million tons of product (Market line 2013b). The largest segment of the industry is the frozen food market. With the same average growth of 2.0%, the value of the market surpassed other segments. In 2012, there was $33.1 billion worth of frozen food market with 7.1 billion tons of

Figure 1. US food industry process channels
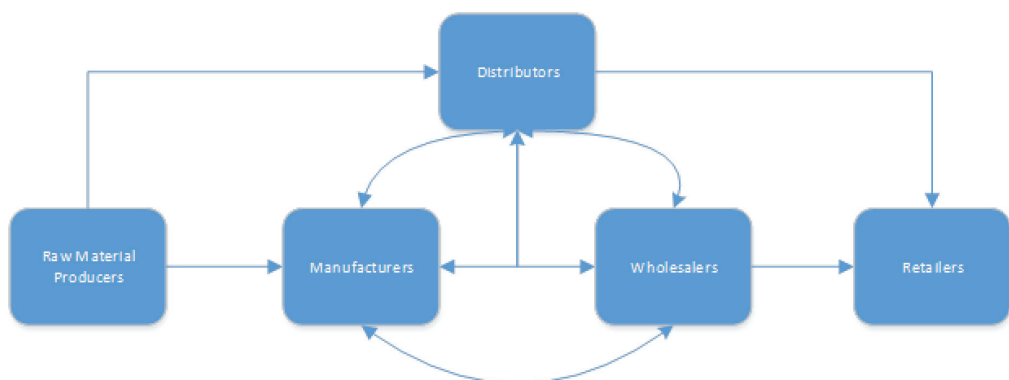
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