

# AFRICA ON THE GO

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## The Need

Food is an essential biological requirement, without which no human life is possible. In addition to being a biological necessity, food has also grown to infuse all aspects of human culture and society. The recent (post-modern) definition of food incorporates factors relating to cultural, environmental and ethical values.

In spite of the recent economic downturn, it is evident that the disposable income of many South Africans has risen appreciably over the past decade. A consequence of this is their ability to spend relatively more on refined styles of eating, and 'eating out' has become more common across many cultures and communities. Consumers have also grown more demanding and no longer rely purely on seasonal foods. In addition, the constant development of new technologies has made it possible to purchase foods from every corner of the globe and at any time of the year.

Consumers have two basic options when purchasing and consuming food and drink. The first is to purchase food and drink from food retailers. Here the food is fresh or partially prepared for consumption in or away from the home. The second is to eat and drink outside the home in a hospitality operation. The latter comprises the catering industry. This industry is characterized by its diversity encompassing many types of food and beverage outlets in a range of different sectors. Regardless of sector, size or branding, food outlets in general have similar needs and face similar challenges in terms of accessing the raw ingredients for the food they will ultimately serve, and across South Africa many thousands of outlets face such challenges alone. A project was undertaken in 2010 to examine whether any communal approaches to solving these challenges would have any benefit to the South Africa hospitality industry at large, concentrating in this instance on the area of Stellenbosch. The focus of the research was specifically on non-franchise restaurants in-and-around the Stellenbosch area with the aim of assisting them to become market leaders.

These non-franchise restaurants, that may be categorized as unbranded outlets (with catering being either their primary or secondary activity) require regular stock replenishments. Since the customers are now more demanding and no longer rely purely on seasonal foods, such restaurants have to ensure that they have a competitive advantage over franchise restaurants in order to be successful. Each restaurant therefore utilizes multiple suppliers, generally ordering only the suppliers' flagship products (i.e. the products the supplier specializes in). These suppliers deliver on different days in the week and on different times in the day. This causes a number of problems.

One problem of these deliveries is that these deliveries result in frequent interruptions for the restaurants. For example, a restaurant places an order to replenish their stock. Currently, due to their supplier-consumer relationship, the restaurant may anticipate delivery on some specific day. The issue is however at what time the ordered stock will be delivered. Combining this issue with the delivery from several suppliers aggravates the situation. A probable consequence of this problem is unnecessary time delay and time lost by the restaurants while awaiting deliveries. This is not only unwanted and frustrating for the restaurants, but may also result in potential customer loss.

Another problem may be the generation of irregular and unnecessary traffic flow. When focusing specifically on the Stellenbosch area - which is relatively over-populated due to it being a student-town - this problem and its consequences become even more significant. And since very few suppliers make use of the same logistic organizations or delivery trucks, even though they may share the same restaurant(s) as customers, the current situation is evidently not optimal. It not only creates excess traffic, but also further damages the ozone layer.

## The Proposed Solution

The proposed solution is to develop a third party supplier hub. A supply hub is a location sited very near a manufacturer's facility where all or some of its supplies are warehoused with the agreement that the materials will be paid for only when consumed. The supplier thus merely manages the customer's inventory at the customer's distribution centre or at a manufacturing node in the network.

Supply hubs have been developed very successfully in many parts of the world, an example of which is India. Several major auto assemblers in India are implementing localization and/or a clustering strategy. India's auto industry has chosen to locate their assembly warehouses in the locality of other new or existing warehouses and near an optimally located supply base.

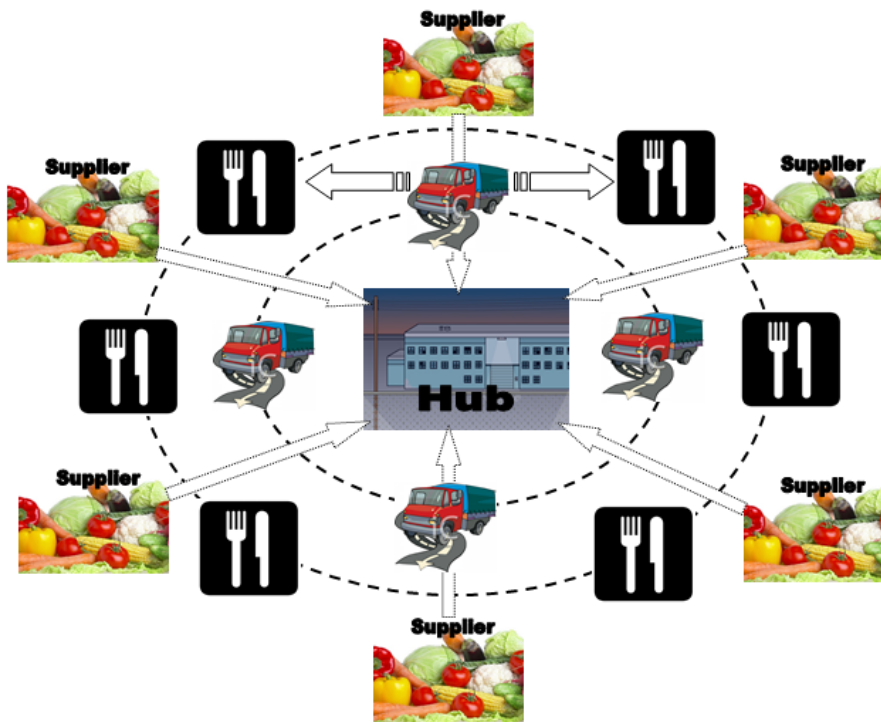


Figure 1: Food Retail Hub System

Refer to Figure 1 for a graphical representation of a supply hub network designed specifically for the food retail division. This hub may thus be seen as the connection between the suppliers and the restaurants; all the suppliers will deliver to one warehouse and all the restaurants will be served (with once-off deliveries) from this same warehouse.

This supply hub network is especially useful in companies with changing and uncertain market demand, shortening product life cycles and uncertain supply lead times. All of these features are common to the food retail division.

A supply hub helps to reduce both the high scope of error in forecasting, and the uncertainty imposed on suppliers to keep sufficient safety stock throughout the supply chain. Further, supply hubs may aid in achieving both leanness and agility at all entities in the supply chain. Lastly, if hubs are located optimally, the maximum measure related to transportation distance or cost may be minimized.

## The Method Followed

The first step in the development of this hub was to undertake market research in order to determine whether a demand for such a proposition exists.

The next step was the determination of a favourable hub location. The more central the hub's location, the less fossil fuel will be consumed. Consequently fewer pollutants will be emitted, less

traffic will be generated, and lower operating expenses will be incurred by the hub. Four proposed hub locations were investigated: Techno Park, Devon Valley, Koelenhof and Plankenbrug. These hub locations were chosen randomly, with the only criteria being locating the hub in an industrial domain. It was also assumed that, initially, no consent from any land owners is needed.

The Clark and Wright's Saving Algorithm was utilized to determine the most optimal hub location. This route scheduling algorithm was programmed in Microsoft Excel using the language, Visual Basic. The objective of this algorithm is to find a solution that minimizes the total transportation costs. This solution further satisfies the criteria that every restaurant is visited exactly once and that the total demand on every route does not exceed the truck's capacity.

Only a sample of non-franchise restaurants was incorporated in the solving of this problem. Thus, by incorporating these restaurant's longitudes and latitudes, the Clark and Wright's Savings Algorithm determined the manner in which the restaurants should be allocated among the routes (i.e. the clustering/ grouping of the restaurants) and the sequence in which the restaurants should be visited on a route.

The last few steps followed entailed the determination of an effective hub floor plan that may be utilized, possible products that can be supplied to the restaurants (e.g. specific perishable and non-perishable foods) and the necessary assets needed to provide the hub's service. Finally, by incorporating all these facets, a cost analysis was done to determine the hub's profitability.

## **Results and Conclusions**

The different hub locations were investigated and weighed against each other. It was determined that the most optimal hub location would be at Plankenbrug. By utilizing this hub location over the other proposed hub locations, a distance of up to 125 km may be saved.<sup>1</sup> This emphasizes the value of optimising the routes. Further, in order to visit all the non-franchise restaurants that form part of the sample exploited in this project, it was determined that seven routes (with their origins at Plankenbrug) need to be employed.

Additionally, it was determined that deliveries be made in the morning period three times per week: on Wednesdays, Fridays and Sundays. This time period and days of delivery correlate to the output obtained from the numeric data analysis of the surveys sent out.

Lastly, the analysis of the hub's capital- and operating expenses clearly shows the hub's profitability. It was calculated that the hub will generate a profit of R270 185.25 per month. This profit is after the operating expenses and capital redemption costs (over a period of 10 years with a rate of 15%) are subtracted, working on a mere 8% profit margin.

## **Selling the Proposed Solution**

In order to make an informed decision, the advantages and disadvantages of both the restaurants' current practice and of this project's proposed solution needed to be considered. Three viewpoints were considered; the restaurants, the suppliers and the general public.

There are three advantages that the non-franchise restaurants will experience if they convert to using a central hub. Firstly, these restaurants will receive once-off and frequent deliveries made on days and times of the day determined by them. Secondly, since the hub will buy food in bulk and also implement appropriate scheduling of restaurants and trustworthy delivery policies, as a result of which the restaurants will receive high quality products at lower costs exactly when they need it. The third benefit that the restaurants will experience, will improve market competitiveness. Due to the hub's lower selling prices, the restaurants will be able to buy and provide a broader range of products.

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<sup>1</sup> It was determined that the total distance (i.e. the distance travelled to visit all the restaurants in the sample of restaurants used in this researcher's project) travelled when the hub is located at Plankenbrug is 150 km. This is up to 125 km less than the total distance travelled when the hub was positioned at the other three proposed hub locations.

The advantages that the suppliers will experience are that they will have regular guaranteed order quantities as well as lower overhead costs. Further, by utilizing appropriate scheduling and grouping of restaurants as proposed herein, less fuel will be consumed (i.e. less fossil fuels will be emitted) and less road traffic will be generated. This will be advantageous to the general public and to the environment.

There are, however, also two disadvantages that were identified through the market research. Firstly, people (in general) are wary of change. In changing their delivery practices, the restaurants and suppliers will enter unknown territory, and that in itself will likely be perceived as a risk to their business. Any such risks can, however, be controlled and rectified with appropriate change management techniques. Secondly, the suppliers and restaurants have built up an intimate relationship (e.g. the restaurants know exactly what the flagship product of each supplier is) and they are afraid to give this knowledge up and into the hands of an unknown third party supplier.

Fear of change and ownership of information are two basic human traits that will need to be managed if outlet owners are to be persuaded to embrace a major change in the servicing of their businesses. However, the potential benefits to be garnered are significant – not only to the individual restaurant owner but also to the wider industry and to the South African public at large. An efficient system of delivery will not only reduce disruption and costs, but will result in far lower traffic volumes. Further, the benefits will also increase as time passes and as the people become acquainted and comfortable with the new principles and trading methods related to this proposition.

## **Recommendations**

Two main recommendations can be made for future research and development. Firstly, it is proposed that the focus of this research be expanded to restaurants on wine estates. These restaurants are positioned further from each other and therefore appropriate scheduling will result in even more transportation cost savings. These restaurants also appear to be enthusiastic about the development of a third party supplier hub. Should the results be positive and then applied to all outlying restaurants per large city in South Africa, the economic impact on roads, fuel consumption, traffic congestion, tyres, repairs and maintenance, and many peripheral wastage could make a major contribution to the national benefit.

Secondly, it is proposed that the effect of operating an e-hub system, utilizing e-commerce practices, be researched. This might entail the implementation of appropriate information systems. As a result, all the clustering entities (the restaurants, their suppliers and the third party supplier hub) will have access to this database. This database may facilitate the restaurants with both easier ordering of products, and the hub with efficiently and effectively scheduling their deliveries, and lead to additional savings not covered by this initial research.

In conclusion, the concept of hubs and clustering is in its infancy and many positive outcomes await those that embark on this path. South Africa once again offers the entrepreneur many opportunities and subsequent riches as they are identified and developed.