DONNYBROOK FAIR
Creating Efficiencies in Stock Management Processes

20th March 2015

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I declare that the work described in this dissertation has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

Signed: ___________________

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20/03/15
ABSTRACT

The aim of this project was to identify inefficiencies in the stock management processes within Donnybrook Fair and provide recommendations for improvement. An analysis of the current stock management processes was conducted using information obtained through interviews with the Morehampton Road store manager. Inefficiencies were identified in the stock management processes and it was found that the current stock management system is no longer fit for purpose. A detailed analysis of the information provided, formed the basis for specific recommendations relating to stock management process improvement and replacement of the current stock management system.
The client for this project is Donnybrook Fair, an expanding gourmet food company operating in a premium market segment. The client contact was Hugh Doyle, the Head of Human Resources, I.T. and Category Management.

The project achieved its objective of analysing existing stock management systems and processes and providing recommendations to address problems identified through the analysis. First, information regarding the processes was obtained through interviews with the Morehampton Road store manager. Then, problems with the current processes were identified through a detailed analysis of the information provided. Following this, solutions and new processes were developed to create improved efficiencies within the stock management processes.

Clear recommendations have been put forward to improve the current management of stock. It is my hope that these recommendations are implemented and provide the basis for ongoing improvement in this growing business.

I would like to thank my client Hugh Doyle. I would also like to express my gratitude to Lorcan Hand, the Morehampton Road store manager, for taking the time to provide me with the information for this project.

Finally I would like to thank my supervisor, Frank Bannister, for his continued support and feedback throughout the year. His constant optimism and our thought provoking discussions were invaluable to me during the project.
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1. INTRODUCTION

This chapter provides details on the background of Donnybrook Fair and outlines the project objectives. The terms of reference are described along with a summary of the chapters in this report.

1.1 The Client Company

Donnybrook Fair is a privately owned food retailer. The first outlet was established in its current modern format in 1999 on Morehampton Road at the site of the historical Donnybrook Fair from which it took its name. This store has developed into the flagship store for Donnybrook Fair. Since then Donnybrook Fair has expanded and it currently operates five retail stores and has plans to open an additional two stores over the next 12 months. At the moment there are four Dublin based stores and one in Greystones Co. Wicklow. The sixth store will be the first on the North side of Dublin and will open in Malahide during the second half of 2015. Mr. Doyle the Chief Executive has stated that the current strategic focus is on growing the business.

1.2 The Project Background

Donnybrook Fair has grown organically and has reached a stage where some of the processes that evolved during this growth are now unsuitable for an organisation with its current scale, complexity, and future ambition. In particular a significant issue has emerged with the stock management process that it currently employs and the role that the Morehampton Road store plays in that process.

The stock room located in the basement of the Morehampton Road store has evolved as the main stock room for all Donnybrook Fair stores. This stock room and the associated procurement processes now play a critical role in the effective functioning of the Donnybrook Fair at Morehampton Road and all of the others stores in the chain. The current processes employed for purchasing, stocking, and supplying to the other stores are not well defined. This has resulted in inefficient work processes, over stocking of certain products, and in some cases stock outs.

Donnybrook Fair recognises these problems and has requested an analysis to identify causes and make recommendation for the improvement of these processes. The analysis will address inefficiencies in the current processes and recommendations will take account of the expanding scale of the operation. The objective of this report is to provide the company with reliable solutions to improve the current stock management process and provide a stable basis for future development.
1.3 Terms of Reference

- Examine the process used by the Morehampton Road store to supply all of its other stores, specifically:
  - how stock is managed in the stock room
  - movement of goods to each shop floor
- Review the workflows involved in getting stock to the shop floor in the main store.
- Recommend improvements to the current processes and stock room management.

1.4 Summary of Remaining Chapters

- **Chapter 2:** provides the key findings relating to the analysis of the stock management processes and system. The recommendations are based on the key findings of the analysis and are broken down into short, medium and long-term recommendations.
- **Chapter 3:** contains the analysis behind the key findings that lead to the recommended solutions. It also contains a risk, M.O.S.T and S.W.O.T analysis of the business.
- **Chapter 4:** provides conclusions that have been reached with regard to the analysis of the stock management processes and system.
2. KEY FINDINGS AND RECOMMENDATIONS

This chapter summarises the key findings and recommendations emerging from the analysis conducted.

2.1 Key Findings

The key findings are:

- The current stock management system, ‘Retail Solutions’ is no longer fit for purpose. (Section 3.1, p. 6).
- The use of the Morehampton Road stock room as a central distribution centre is unsuitable and already causing problems for Donnybrook Fair. Its continued use in this role is unsustainable in the medium or long term. (Section 3.2, p. 10).
- Due to the size and location of the stock room in the Morehampton Road store it will not be physically possible or financially advantageous to run a distribution centre in these premises at the necessary scale. (Section 3.2, p. 10).
- Stock levels cannot be accurately determined in the Morehampton Road store. All goods received in the Morehampton Road store, including lines destined for other stores, are allocated to the Morehampton Road store on the stock management system. This leads to stock outs and overstocking. (Section 3.3, p. 13)
- Inventory held for each store in the Morehampton Road stock room is not physically separated. This creates a risk that stock purchased for the Morehampton Road store is sent, in error, to other stores. This can result in stock outs in the Morehampton Road store. (Section 3.3, p. 13).
- Due to the combined stock located in the Morehampton Road stock room, a manual stocktake cannot provide the store management with accurate inventory levels. (Section 3.3, p. 13).
- The Morehampton Road store does not receive defined stock orders from the other Donnybrook Fair stores. This results in the Morehampton Road store manager having to order for all other stores based only on crude estimates. This is leading to stock availability problems and the problem will get progressively worse as the company expands. (Section 3.4, p. 15).
- The Morehampton Road store manager, who orders some lines for all stores, has no information available on the other stores’ individual sales. This makes demand forecasting unreliable. (Section 3.4, p. 15).
- The current process in Morehampton Road for moving stock from the stock room to the shop floor involves too many steps and includes an excessive amount of list making. This process, according to the store manager, is wasting 50-60 hours of labour per week. (Section 3.5, p. 17).
2.2 **Key Recommendations**

The key recommendations are:

**Short-Term**

- The stock in the Morehampton Road stock room should be physically separated by store assignment. (Section 3.3, p. 13)
- All store managers should take responsibility for and generate their own orders. Then send these orders to the Morehampton Road store for review and consolidation. (Section 3.4, p. 15)
- The process whereby the Morehampton Road store is required to estimate other store’s needs, without sufficient information, should be discontinued. (Section 3.4, p. 15)
- The Morehampton Road store manager should place any orders for the other stores as an additional separate order to their own. (Section 3.4, p.15)
- The inventory for Morehampton Road and the other stores should be separated on the stock management system. (Section 3.3, p. 13).
- The store manager for the Morehampton Road store has established a system to reliably inform them what suppliers need to be ordered from each day. This system should be replicated in all of the other stores to reduce errors seen in the current ad-hoc process. (Section 3.4, p. 15).
- To ensure all stores take active responsibility for stock management, Donnybrook Fair senior management should put a policy in place to define when other stores may request products from the Morehampton Road Store, for lines where direct suppliers are already set up. Such requests should only be allowed to occur in an emergency. Management will have to define what constitutes an emergency in this context. (Section 3.4, p. 15).
- The number of steps involved in moving stock from the stock room to the shop floor should be reduced. The information recorded by the point of sale system should be utilised to improve this process. (Section 3.5, p. 17)
- A sales report should be run at defined periods throughout the day. The report should then be used to pick the stock from the stock room to restock the shelves in a regular timely rotation. (Section 3.5, p. 17).

**Medium-Term**

- The company should invest in a new stock management system suited to a multi-site retail environment. (Section 3.1, p. 6)
- The company should commission an experienced consultant to prepare a requirement specification for a new stock management system with the scalability required. (Section 3.1, p. 6)
- A number of new systems should be reviewed in order to select the ideal system for the future of the business, taking into account the strategic decisions in relation to centralised vs localised stock management. (Section 3.1, p. 6)
Long-Term

- The company should move to a centralised distribution system with a cross-docking operation. (Section 3.2, p. 10).
- A central warehouse should be developed outside of the city centre at a location suitable for ease of access to all stores. (Section 3.2, p. 10).
- The site for the warehouse should have easy access to major road networks to facilitate future development. (Section 3.2, p. 10).
- A logistics expert should be consulted to determine the point at which moving to a scalable centralised distribution system will become financially and operationally viable. (Section 3.2, p. 10).
3. **ANALYSIS**

This chapter provides an analysis of the current problems within the stock management process. A risk analysis is provided along with a Strengths, Weakness, Opportunity and Threats (S.W.O.T) and Mission, Objectives, Strategy and Tactics (M.O.S.T) analysis. The information for the analysis was gathered through interviews with the Morehampton Road store manager.

3.1 **Stock Management System**

It was found that the current stock management system is no longer fit for purpose. This conclusion was reached after several substantive issues with the system were identified. The following paragraphs describe the problems with the current system:

**Current Problems**

The Morehampton Road store currently manages all of its own lines and in addition, some lines, for all of the other stores. It effectively acts as a central procurement and distribution centre. The Morehampton Road store manager places orders for the main store and (acting as central purchaser) orders additional quantities for the other stores. The current stock management system provides the Morehampton Road store manager with no effective means of accurately calculating optimal order quantities. The Morehampton Road store manager is therefore required to make the orders based on crude estimates of what the other stores ‘usually’ take from him.

The system currently in use by Donnybrook Fair for stock management is ‘Retail Solutions’. This system does not provide details on individual sales by store. The Morehampton Road store manager only has access to the sales for the main store. This is problematic as it makes it impossible for the store manager to accurately calculate order requirements and take into account any recent fluctuations in sales history across other stores. This has led to serious problems of stock outs, consequential loss of sales and profits, and the more serious long term risk of reduced customer retention levels. Critical stock outs risk not just the loss of the sale of that product, but the sale of other products as the customers go elsewhere for their broader shopping needs. Continued stock-outs risk Donnybrook Fair being perceived by customers as an unreliable source. Moving stock levels higher to reduce this risk alleviates the customer risk but ties up space and working capital. Overstocking also risks stock loss through shrinkage and is a particular risk in food retail where shorter shelf-life results in the indirect negative effects of customer dissatisfaction and the direct loss of out of date merchandise. Given the perishable nature of large elements of Donnybrook Fair stock, this is a significant concern.

The current stock management system does not enable the store manager to keep the inventory levels tight. The automation of reorder quantities, an essential element to efficient purchasing processes in a fast moving consumer goods environment, is severely limited in the current Retail Solutions system. The system allows the purchaser to specify the number of days they wish to base the sales history on. In practice this has resulted in a method of operation where, if it is a supplier that is usually ordered from every 14 days, then 18 days...
sales would be selected to cover the 14 day reorder period. The system then calculates
stock sold over that 18 day period, details current stock levels on the system, takes account
of minimum stock levels, and suggests a reorder quantity. This type of reorder averaging
provides a basic level of functionality but does not provide a sufficient basis for the efficient
management of stock in a growing and multi-site organisation.

The system is unable to automatically update minimum stock levels based on sales patterns. If, for example, a product was selling at 10 per week but is now selling at 40 per week the system will not pick that up. Conversely, the system will not catch if a products sales has slowed and a lower minimum stock level would be appropriate. Therefore, there could in fact be enough stock, but the system will suggest ordering more as it is based on an average of sales. The minimum stock level must be changed manually for each individual product creating additional workload in an environment where the Morehampton Road store manager is already working on limited information. This leads to valuable time being wasted as the process of manually assessing and changing minimum stock levels by product is slow and prone to human error or oversight.

The system as it is currently operating leads to missed sales due to stock outs and extra expenses due to over stocking. The system does not provide information or warnings in relation to stock outs. It is therefore likely that sales are lost and this potential for additional sales, if the products were in stock, is not included in the following round of orders. This can lead to an ongoing cycle of stock outs as the information triggering recommended reorder quantities is only based on an average of sales. Additionally the system does not flag trend variations. If, for example, a product were to increase or decrease sales by 50% in a ten day period the system would not flag this change and instead would simply calculate a reorder level based on the historical minimum and 18 day average (if that is the period chosen). The store manager is therefore not informed of potential or actual stock outs and must rely on skill and experience to try and overcome the system deficiencies. When the store suffers from stock outs the store manager is also unable to know exactly how many sales the store has lost.

The system is unable to detect seasonality. If this were possible it would allow the store to ensure they have enough products in stock and to avoid holding out of season stock, notwithstanding the seasonal fluctuations. A basic advance would be to include the possibility of categorising products that greatly vary by summer and winter, for example, ice cream and salads. A more advanced system could pull information from the weather forecast and provide more accurate real time triggers to enable sales that may have otherwise been impossible. This could be achieved through relatively simple means such as putting a buffer into the system for the salads made in the shop. If, for example, the temperature exceeds 15 degrees it could trigger additional production of salad lunch packs by say 5%. More advanced long term forecasting initiated either by weather, known seasonal high points such as public holiday weekends, or combinations could recommend, for example, increasing inventory for the barbeque range in store.

The system should be capable of performing inter-company transfers for inventory because the Morehampton Road store orders products for the other stores before then sending them
out. The current system and process does not always capture these transfers correctly.

The current system provides no multi-site visibility of stock, it cannot identify local differences in product requirements by store and makes effective stock counts in Morehampton Road difficult if not impossible. The result is that stock orders cannot be reliably determined other than through the judgement of the Morehampton Road store manager.

**Advantages of a New System**

An improved stock management system would bring many advantages to the business. A significant advance would occur if the Morehampton Road store was able to access sales figures for all stores. This advance should be seen as a basic necessity for effective and efficient stock management. The system would allow Morehampton Road to monitor all sales demand, provide local stores managers with detailed store information on sales and provide recommendations, to be reviewed locally, for stock purchase. The current system can only produce this level of information for the Morehampton Road store. This advance would reduce the potential for over or under ordering.

The Morehampton Road store manager has made clear the desire and need to keep inventory levels tight. The capacity to capture information in all stores is an essential step in confirming accurate stock levels and functional security controls. In addition the availability of accurate stock level data forms the basis for any effective stock control system where under and overstocking is to be avoided and where wastage and shrinkage can be readily identified. Building on store specific sales data and accurate stock data, a level of confidence can be built to move beyond simple average based reorder levels to more advanced real-time assessments that incorporate automatic shifts in minimum order quantities based on actual sales. The current process of manually inspecting sales and updating minimum stock levels for individual products is time consuming and error prone. Automating this process would be beneficial to the company by saving valuable time, minimising the chance of errors, and freeing the store manager to engage in more value adding activities. The risk of stock outs would be reduced as the system would inform the store manager in a timely manner if sales had picked up, thus giving time to order additional stock.

A new system should also inform the store manager when orders for certain products should be increased based on seasonality patterns. This would allow the company to order more stock than usual to cover an increased demand. The company would no longer miss out on these sales as the system would inform managers that the demand for certain products are likely to increase and then automatically reduce stock level recommendations after the event.

Through ongoing analysis of stock levels and stock outs and recording of results, such a system would, overtime, ‘learn’ to flag opportunities and warn of potential issues. For example stock flagged as Halloween or Christmas would be flagged to stop purchasing and for quick liquidation at the appropriate time.
Conclusion

The current stock management system is no longer fit for purpose and will be unable to efficiently and effectively serve the needs of the business in the medium and long term. Problems are already emerging and maintaining the current processes is costly in terms of time, working capital spent on overstocking, lost sales and reduced customer satisfaction due to stock outs.

A new system would increase the sales performance of the company. It would also minimise the risk of suffering from either stock outs or overstocking. There would also be a considerable amount of time saved by automating tasks currently performed manually and this would release the experienced Morehampton Road store manager to engage in other value adding activities. A new system should allow for multi-store operations to be performed effectively and set a solid platform for future growth.

The following are initial recommendations of system requirements based on the information already obtained:

- There is a clear requirement for a stock management system that can support multi-store operations.
- The system should incorporate electronic data interchange (EDI) as this will become an essential for efficiency as the operation scales. EDI should not be implemented until robust stock control and purchasing procedures are established.
- The system should have a capacity to include seasonal variation when suggesting purchase quantities.
- The system should be able to base purchases on actual sales instead of using an average.
- The system should have the capacity to incorporate trend data and adjust minimum stock levels automatically.
- It is essential that the system provides ready access to information on individual store sales and stock.
- The new system should be able to capture inter-company transfers.

The purchase and implementation of a new stock management system will be an important development milestone for Donnybrook Fair. It signals the company’s move from the organic development of systems and processes to a more strategically driven decision to establish operationally capable growth platforms. Core to the effectiveness of this will be several operating principles including the ability to adjust base stock forecasts using:

- information on seasonality factors
- live sales trends
- qualitative input from experienced central purchasing staff
- qualitative input from local managers with local trend/taste knowledge

The company should commission an experienced consultant to perform a requirement specification for a new stock management system. This will allow Donnybrook Fair to identify
the best system for the current and future needs of the company. It is imperative that future requirements for the system are specified to accommodate planned growth. Given the immediate growth horizon and current issues, it is not recommended that time is lost or resources expended trying to adapt the current system as fixes will be short term and put off the inevitable investment needed to manage multi-site growth.

3.2 Distribution Centre

The Morehampton Road stock room is currently functioning as the standard stock room for the store and additionally as a central distribution centre for the other stores on some stock lines. The current situation is a hybrid process that has evolved where local store managers order some of their products directly from suppliers while having other orders centrally procured by the Morehampton Road store and then being delivered to them.

Current Process

The diagram in figure 3.2.1 depicts how inventory is currently distributed. It shows that orders for some lines are processed by the Morehampton Road store for the other stores. The Morehampton Road store places these orders, has the stock delivered to Morehampton Road, and when a store requests these products the Morehampton Road store picks and delivers them. For other lines local stores order directly from suppliers. These orders are then delivered directly to the stores from the suppliers.

![Diagram of Current Distribution System]

Problems with the Current Distribution Process

The current process requires suppliers for Donnybrook Fair to make small deliveries to each store. Without central oversight this risks additional delivery charges, stock build up in one store while there is demand in another and overall higher levels of stock. Following this approach requires each new store to build storage space for stock that could be more
efficiently managed in a central location. This represents a capital cost for the company and risks operating costs through less than optimal stock management. In addition any ground floor level space allocated to storage is a reduction in revenue generating store space potential.

Each store is also impacted by having many individual suppliers delivering to them, as they have to divert staff to the storeroom to receive these small deliveries. Any delays in the deliveries can also result in stock outs. The problems associated with the current situation have been mitigated to some extent through the efforts of the Morehampton Road store manager and other staff who work diligently to avoid the deficiencies of the process and system. However, given the growing scale and increased physical distance of stores the limits of the current process is being reached.

As the number of stores increase and become more geographically spread, it will not be feasible to use the Morehampton Road stock room as a distribution centre. The location is a problem logistically as it is in the centre of the city and would it would not be suitable to have large vehicles delivering and picking up inventory from the store each day. The stock room is also not large enough to scale a distribution centre in these premises. It would not be physically possible or financially advantageous.

**Recommended Distribution Process**

To address the growth and efficiency needs it is recommended that a central distribution warehouse with a cross-docking operation is developed. This facilitates a process where the supplier delivers full load quantities to one location instead of individual stores. An important function of the central distribution centre will be to consolidate the products from various suppliers into deliveries for individual stores and thereby reduce the total number of deliveries and disruptions to those stores. This will allow Donnybrook Fair to deliver full loads made up of a number of suppliers’ products to individual stores, rather than a variety of part deliveries (Figure 3.2.2).

![Recommended Distribution System](image)
When goods are delivered to the central warehouse by suppliers, they are allocated to a receiving dock on one side of the ‘cross dock’ terminal. Once the inbound transportation has been docked, its products can be moved either directly or indirectly to the outbound destinations. After being sorted, products are moved to the other end of the ‘cross dock’ terminal via a forklift, conveyor belt, pallet truck or other means of transportation to their destined outbound dock. When the outbound transportation has been loaded, the products can then make their way to the stores (Figure 3.2.3).

![Cross-Docking Operation in the Central Warehouse](image)

**Figure 3.2.3 – Cross-Docking Operation in the Central Warehouse**

**Advantages of a Centralised Distribution System**

Such a system could considerably reduce delivery costs as only one delivery will then have to be made by the supplier. Each store’s order can then be prepared at the warehouse and shipped out. This would save each store having to process numerous deliveries from suppliers each week. The time required by staff to process deliveries to their store will be significantly reduced as they will no longer be receiving numerous deliveries from different suppliers throughout the day.

Introducing a centralised distribution system will enable the company to have regular, efficient and reliable distribution which will allow Donnybrook Fair to reduce the amount of
inventory each shop holds and increase the range of goods that are stocked at each store. This will result in less stock room space requirements for new stores and it also opens up more shop floor space. Therefore each store will benefit from reduced costs. The stores will also be utilising space for sales that would otherwise be needed to store inventory.

Implementing a cross-docking operation will reduce material handling. This allows for efficient product sorting and the customisation of outgoing pack types and sizes to reflect the different goods inwards capabilities of local stores. The need to store products in the warehouse will be minimised which means there will be no need for a large warehouse area. This reduces the cost of procuring a central warehouse. The labour costs, for the warehouse, will be reduced as there will be no packaging and storing.

This process has benefits for effective and efficient central procurement and price negotiation, stock management, and faster response to local store needs. It avoids stock duplication and stock build up in local stores.

The time it takes for products to reach each store will be significantly reduced. The vehicles used will have fuller loads for each trip therefore saving in transportation costs while also being more environmentally friendly. Products are moved more quickly through a cross dock and it is easier to screen product quality. As there is a high turnover of products, they will usually spend less than 24 hours in the terminal.

Cross-docking eliminates processes such as ‘pick-location’ and ‘order-picking’. Constructing a cross docking terminal is also less expensive to construct than the average warehouse. Products destined for stores in a similar location can be transported as a full load, reducing overall distribution costs.

Conclusion

In the medium to long-term a centralised distribution system with a cross-docking operation should be implemented. The company should budget for an investment in a central warehouse. This will be required as the current process cannot scale with the future expansion of the business. A logistics expert should be consulted to find at what point moving to this process will be most beneficial.

The site will need to be outside of the city centre with access to major roads. It should be situated in a location that will benefit the long-term future of the company taking into account its geographical expansion plans. This will facilitate easier vehicular access to the central warehouse, reduce delivery costs, and improve service levels to the stores.

3.3 Warehouse Management

The Morehampton Road stock room cannot be managed as efficiently as it might be due to its dual role as both a store warehouse and central distribution centre.

Current Problems

All deliveries to the Morehampton Road store are entered into the stock management
system as inventory for the Morehampton Road store. This prevents the store from being able to perform an accurate stocktake. It can appear at any time as if they are carrying too much stock because they are also carrying stock for the other stores. This information deficiency is a serious barrier to efficient stock management.

Entering all delivered stock into the system as inventory for the Morehampton Road store is inefficient as the store manager needs to double handle the stock. The stock is first entered into the system as inventory before it is later entered into the system as an inter-company transfer when the products are delivered to another store.

An additional problem with the warehouse is that the products are not physically separated in the stock room. This has led directly to the Morehampton Road store suffering from stock outs. This occurs because when any one of the other stores sends a request for products to the Morehampton Road store, staff from the shop floor are sent down to pick the stock. As the stock is not separated, if, as it is reported to happen, another store requests more stock than the Morehampton Road store manager had estimated their demand to be, the additional quantity is fulfilled from stock that should have been allocated to the Morehampton Road store. This results in the Morehampton Road store being left short of stock as they are shipping their own inventory to meet an unplanned order. This is clearly unacceptable given the risk of revenue loss and customer dissatisfaction.

With no means to conduct an accurate stock count, the Morehampton Road store manager finds himself in the ongoing position of estimating stock levels and using crude stock demand estimates for other stores. The consequences of any errors are then likely to be felt in the Morehampton Road store in the form of stock outs or excess inventory.

Solutions

In the short-term, while the Morehampton Road stock room is also being used as a distribution centre, the store must separate their own stock from that purchased for other stores. The goods could be separated in the stock room by having set bays. The goods that are held in the Morehampton Road store for the other stores could then be separated into each of these bays. Alternatively, if the limited space in the Morehampton Road stock room made this unworkable, the stock could be kept on colour coded or numbered crates to separate the stock.

Only the stock that is for the main store should be entered into the stock management system as inventory for that store. With the current stock management system, this would require the orders to be delivered with two separate invoices. To facilitate this and provide more accurate demand forecasting other stores should commence sending defined order requests (see section 3.4, p.15). This would allow the store manager to enter the orders into the system separately.

Advantages

The result of physically separating the stock will be easy identification of stock requests from stores that exceed the quantities ordered for them. This will, despite the stock management
system limitations, allow for more accurate stock counts. It would also help prevent the possibility of the Morehampton Road store sending out stock that was ordered as inventory for their store. This would also help flag the source of stock outs and enable the physical identification of overstocked products.

Entering the deliveries separately into the stock management system will improve efficiency. The store would then be able to know, accurately, how much stock the store is holding and would be a significant help in improving sales and reducing costs. The risk of stock outs occurring would be decreased, which means they would reduce the chance of missed sales. It would also help determine if products are being overstocked. In addition the store would be able to identify, quickly, if sales have declined or if the stock level is wrong.

**Conclusion**

It is recommended that the stock is separated, both physically in the stock room and on the stock management system, as soon as possible. This should have an immediate positive impact on costs and service levels.

### 3.4 Central Ordering

The current process is inaccurate and inefficient due to the lack of information available to the Morehampton Road store manager.

**Current Process**

As discussed in section 3.2 the Morehampton Road store orders some products for the other stores. The Store manager for the Morehampton Road store is responsible for making the central orders. Currently the store manager makes these orders, for the other stores, based on what they ‘usually’ take from the Morehampton Road store.

**Problems with the Current Process**

This current process leads directly to problems of overstocking and stock outs in the Morehampton Road store. The Morehampton Road store manager does not have access to sales information from the other stores and these stores do not send defined orders to the Morehampton Road store. This presents a serious problem as sales for the other stores can pick up or decline without this information being passed on to the Morehampton Road store. While there is no quantification of this problem available, given that all information lags orders, it must be assumed that substantial stock inaccuracies exist. The current process also passes the responsibility for accurate stock ordering to the Morehampton Road store manager who neither has access to accurate information or local knowledge of individual store conditions that affect demand.

It was also identified during interviews with the Morehampton Road store manager that the other store managers would sometimes fail to order the correct stock that they should normally get directly from a supplier. When the shortfall was identified the other stores would then send a request for the stock to the Morehampton Road store. Given the issues identified in the previous sections, the stock is then taken from the Morehampton Road
store's stock, leaving a shortage in their store inventory.

The current process creates a situation where local store managers do not take full responsibility for managing their stock levels. Instead the responsibility and consequences lie with the Morehampton Road store.

**Solutions**

All stores should provide the Morehampton Road store manager with defined orders and the process of requiring the Morehampton Road store manager to develop crude estimates based on insufficient data should cease. The Morehampton Road store manager believes that the other stores cannot effectively implement this change, at present, as they do not have a defined core product range.

However, as the other stores are currently placing orders directly with suppliers it should be possible to extend this practice to lines ordered via the Morehampton Road store. This would allow the Morehampton Road store manager to place these store orders as an additional order with the suppliers and facilitate stock separation on receipt of goods with separate delivery notes and invoices.

The practice of the other stores requesting products from the main store, for which they have their own suppliers set up, is problematic. It is recommended that management put a policy in place to stop this practice from occurring except in the case of an emergency. The management should define what constitutes an emergency in this context. At a minimum, stores should be required to flag requests that are for stock normally ordered directly from suppliers, if they wish to request a drawdown of stock from the Morehampton Road store. This will allow for the implication of the action to be properly considered and over time, the scale of the problem can be quantified and appropriate corrective action taken.

The Morehampton Road store manager has implemented a system in that store to provide scheduled purchase reminders on a daily basis. This simple but effective system informs them which suppliers need to be ordered from each day. When an order is made the system is then manually updated with the next date that particular supplier needs to be ordered from.

While the system is simple, the Morehampton Road store manager has stated that as a result they never forget to order from a supplier. This system should be implemented in all of the other stores to support timely order placement.

**Advantages**

Implementing these solutions would give the other stores more responsibility for their inventory. It would also reduce and in time eliminate the need for the Morehampton Road store manager to prepare orders based on crude estimates.

The process would then provide a more controlled environment with some distributed responsibility closer to the customer. More accurate purchasing controls will directly lead to greater stock management effectiveness. This would also allow the Morehampton Road
store manager to send these orders as an additional order. Therefore the stock would be
delivered with two separate invoices, enabling the Morehampton Road store manager to
to enter the stock into the stock management system separately.

Putting a policy in place to stop the other stores from requesting products, which they have
their own suppliers for, from the Morehampton Road store, will prevent the main store
suffering from stock outs due to these requests.

**Conclusion**

The source of stock outs and overstocking cannot be fully determined and there is little
incentive for other store managers to accurately predict requirements as they are neither
charged for the capital cost of excess stock (as no effective stock transfers system is in
operation) nor fully penalised for stock outs (as they can draw on Morehampton Road stock
to alleviate shortfalls

The other stores should begin to send defined orders to the Morehampton Road store
immediately. Management should also put a policy in place regarding the other stores
requesting products from the main store, for which they have their own suppliers. This
should not be allowed, except in emergencies, as it risks the Morehampton Road store being
affected from stock outs. This process change would provide more control and give more
responsibility to the other stores for their stock management.

### 3.5 Restocking Process

**Current Process**

The current process used to move stock from the stock room to the shop floor, in the
Morehampton Road store, is displayed in figure 3.5.1. The first step involved is for the floor
staff to make a list of the inventory in the stock room. They then bring this list to the shop
floor. Here they check what products are not on display but are currently in stock. They then
return to the stock room with this new list. The next step is to pick the products in the stock
room. This stock is then brought up to the shop floor. The stock is then displayed on the
shelves. They then produce a further list of the products currently on display but not fully
stocked. They then return to the stock room. The stock from this new list is then picked from
the stock room. They then bring this stock up to the shop floor. The last step in the process
is to then fully restock the shelves with these products.
Problems with the Current Process

It is clear from an assessment of the process flow that it is inefficient. The process is labour intensive and there is an excessive amount of time spent making lists. The current process also requires staff to make two trips to the stock room to pick stock. The current process does not utilise any technology and is a completely manual process. The store manager estimates that 50-60 hours of labour a week are being wasted with the current process.

Recommended Process

Quick improvements could be made by merging steps 3 and 8 in this process. This would remove the need to enter the stock room twice. It would also remove the need for an extra list to be made. If this were to be implemented it would save time in moving stock from the stock room to the shop floor.

Further improvements will require a more significant overhaul of the process. The process should be significantly shortened, see figure 3.5.2. The cash registers in the store provide point of sale records. The store management also knows how much stock is able to fit on the shelves. The information from the point of sale records can be used to produce regular sales reports. At regular, predetermined, intervals staff can run the sales report which is then used by the stock room staff as a pick list. This stock can then be left ready for the floor staff. The floor staff can then regularly restock during the day.
Advantages of Implementing this Process

The Morehampton Road store manager has estimated that this streamlined process could save in the region of 50-60 hours of labour per week. There should be minimal costs involved to implement this change as the sales data required is already being recorded. The new process simply utilises this existing resource. In addition to the cost saving, the system will improve stock levels on display and therefore will have a positive effect on sales revenue and customer satisfaction.

Conclusion

As the resources to implement this change are already in place, it should be implemented immediately. The benefits of the new process will accrue quickly.

3.6 M.O.S.T Analysis – Mission, Objectives, Strategy and Tactics

M.O.S.T analysis is a highly-structured method for providing targets to team members at every level of the organisation. Working from the top down, it ensures that focus is retained on the goals that matter most to the organisation. As a system, it breaks down the communication barriers between different levels on the same team by asking at every stage “How does this help the business reach the next level of targets?” In this way, every tactic employed has to be justified in terms of reaching strategies, which in turn must contribute to objectives, which must, finally, contribute to the mission.

It is used here to aid the development of an improvement plan for Donnybrook Fair. It provides a clear picture of what needs to be done (Objectives) to improve the business all the way through to how each of these objectives can be completed (Tactics).

Mission

To reduce costs by identifying and improving inefficient processes that currently exist within the company and, in doing so, also increase sales.

Objective

Enhance stock management system capabilities to provide information and decision support necessary for growing multi-site operations.

Strategy

Replace the current stock management system.

Tactics

An experienced consultant should be commissioned to perform a requirement analysis. The current and future requirements for the system should be taken into account. The consultant should review a number of possible systems that meet the requirements and recommended the most suitable system.
**Objective**  
Improve physical stock management in the Morehampton Road stock room as an interim measure until centralised distribution can be introduced.

**Strategy**  
Physically separate the Morehampton Road store and other store’s stock.

**Tactics**  
Utilise separate bays for each store’s stock or if space does not allow, colour code crates by store and implement strict procedures to maintain separation.

---

**Objective**  
Improve the purchasing accuracy in the Morehampton Road store.

**Strategy**  
Increase the responsibility of satellite store managers in the stock purchasing process for centrally ordered lines.

**Tactics**  
Enable satellite store managers to utilise store sales data, improved information from the new stock management system and their own qualitative inputs to prepare suggested orders for all lines purchased through the Morehampton Road store. The Morehampton Road store manager should review and place orders with suppliers, while maintaining order separation to support stock separation discussed above.

---

**Objective**  
Improve the efficiency of restocking shelves on the shop floor.

**Strategy**  
Eliminate steps in the current process through the application of existing technology.

**Tactics**  
By utilising point of sale data, a sales report should be prepared for stock room staff at predefined times each day. Stock room staff then pick the stock and leave it ready for shop floor staff to restock at peak times.

---

### 3.7 Risk and Opportunity Analysis

A risk analysis provides a mechanism for identifying which risks represent opportunities and which represent potential pitfalls. The risk analysis gives a clear view of variables to which the business may be exposed, whether internal or external, retrospective or forward looking. It is a systematic process for identifying and evaluating events (i.e. possible risks or opportunities) that could affect the achievement of objectives, positively or negatively. These
events can be identified in the external environment (e.g. economic trends, competition) and within the organisation’s internal environment (e.g. people, process and infrastructure).

The events identified as potentially impeding the objectives of the business are deemed risks and are evaluated based on the likelihood of occurrence and the significance of their impact on the objectives. The individual ratings are then brought together in the form of a risk map and an opportunity map see figures 3.7.1 and 3.7.2. For this analysis a 1-5 scale was used for both likelihood and impact. The scales can be viewed in Appendix C, p. C.1, C.2. The score each risk/opportunity receives is the product of the likelihood and impact scores, see Appendix C, p. C.3. Risk and opportunity maps were developed for the following opportunities and risks, these maps can be found in Appendix C, p. C.4.

- **(A) Opportunity** – Increase sales.
  - **Likelihood – Certain.**
    The current stock management system, ‘Retail Solutions’, is already harming the financial performance of the company. It is certain that as long as this system is being used the profits for Donnybrook Fair will not be reaching their potential. If products are picking up in sales the system is unable to utilise this information automatically, this can result in management not ordering enough to meet the demand of customers. The system does not incorporate seasonal information either. A number of other issues with the system have been detailed in section 3.1. These problems have led to stock outs and will continue to do so in the future.
  - **Impact – Moderate.**
    The full potential for profits is not being reached by the company. This system does not allow the company to take the opportunities presented to increase sales. This has a moderate effect on the company as it results in less profit. It can also lead to the reputation of the company being damaged as the customers are left disappointed by products being unavailable. The introduction of a new system to solve this will bring increased sales and an improved financial performance.

- **(B) Risk** - Stock outs.
  - **Likelihood – Moderate.**
    Stock outs can occur too easily with the current processes for managing stock in the stock room. The inventory in the stock room is not split up for each store. This has resulted in inventory for the Morehampton Road store being transferred to other stores. The store manager is also required to order inventory for the other stores based on what he knows they ‘usually’ take. These problems will continue to occur with the current stock room management processes.
    Implementing the key recommendations in this report would reduce the likelihood of this risk occurring. The improvements would mean that this risk would rarely be an issue.
- **Impact – Serious.**
  Stock outs pose a serious problem to the company. The stock outs lead to Donnybrook Fair missing out on potential sales. This not only harms the profits of the company but also damages its reputation with customers.

- **(C) Risk – Overstocking.**
  - **Likelihood – High.**
    The current central ordering process is a problem. This process is currently having a negative impact on the financial performance of the company. The undefined process and rough estimations of goods to purchase has led to overstocking. This process will continue to cause these problems in the future. This problem is compounded by the way stock is stored. The Morehampton Road store cannot perform an accurate stocktake, which means they do not know how much stock is being held for that store.
    The recommendations provided in this report would significantly reduce the likelihood of this risk occurring. Currently this risk occurs often. The recommendations would reduce the occurrence of this risk to almost never.
  - **Impact - Moderate.**
    These problems will result in the financial performance of the company being moderately impacted. Overstocking of products causes cash to be tied up in inventory that is not making any money. This can also lead to inventory expiring before it can be used. Stock outs as already stated will result in loss sales and possible damage to the reputation of the company.

- **(D) Opportunity – Improve the process for restocking shelves.**
  - **Likelihood – Certain.**
    The current process is highly inefficient. This will waste resources every time the store shelves need to be restocked. Thus if this process were to be refined it would save resources on a daily basis.
  - **Impact – Moderate.**
    The improved process which is detailed in section 3.5 would save between 50-60 hours of labour a week. This would translate into savings for the company of about €20000 a year on wages alone.

- **(E) Risk – Shrinkage.**
  - **Likelihood – Low.**
    At the current size of Donnybrook Fair the likelihood of theft is low. But due to the inefficiencies with stock management this is a possibility.
  - **Impact – Incidental.**
    This is not a serious problem now but may become one in the future as the company expands. This risk will need to be monitored.
### 3.8 S.W.O.T Analysis – Strengths, Weaknesses, Opportunities and Threats

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High quality reputation</td>
<td>1. IT systems and capabilities</td>
</tr>
<tr>
<td>2. Abundance of staff</td>
<td>2. Business processes</td>
</tr>
<tr>
<td>3. Good customer service</td>
<td>3. Limited warehouse space</td>
</tr>
<tr>
<td>4. Responsive to sales</td>
<td>4. Organic growth – no outside funding</td>
</tr>
<tr>
<td>5. Capacity to expand</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Innovation and tech development</td>
<td>1. Stock outs</td>
</tr>
<tr>
<td>2. New distribution channels</td>
<td>2. Loss of sales</td>
</tr>
<tr>
<td>3. Improve response time to sales</td>
<td>3. High costs</td>
</tr>
<tr>
<td>4. Expansion</td>
<td>4. Large well-funded competitors</td>
</tr>
</tbody>
</table>
4. CONCLUSIONS

The current stock management system is no longer fit for purpose and will be unable to efficiently and effectively serve the needs of the business in the medium and long term. Problems are already emerging and maintaining the current processes is costly in terms of time, working capital spent on overstocking, lost sales and reduced customer satisfaction due to stock outs. The company should commission an experienced consultant to perform a requirement specification for a new stock management system. This will allow Donnybrook Fair to identify the best system for the current and future needs of the company. It is imperative that future requirements for the system are specified to accommodate planned growth. Given the immediate growth horizon and current issues, it is not recommended that time is lost or resources expended trying to adapt the current system as fixes will be short term and put off the inevitable investment needed to manage multi-site growth. (Section 3.1, p. 6)

The Morehampton Road stock room is currently functioning as the standard stock room for the store and additionally as a central distribution centre for the other stores on some stock lines. The current situation is a hybrid process that has evolved where local store managers order some of their products directly from suppliers while having other orders centrally procured by the Morehampton Road store and then being delivered to them. In the medium to long-term a centralised distribution system with a cross-docking operation should be implemented. The company should budget for an investment in a central warehouse. This will be required as the current process cannot scale with the future expansion of the business. A logistics expert should be consulted to find at what point moving to this process will be most beneficial. (Section 3.2, p. 10)

The Morehampton Road stock room cannot be managed as efficiently as it might be due to its dual role as both a store warehouse and central distribution centre. However, there are improvements that can be made to the management of the stock. It is recommended that the stock is separated, both physically in the stock room and on the stock management system, as soon as possible. This should have an immediate positive impact on costs and service levels. (Section 3.3, p 13)

The current process, for central ordering, is inaccurate and inefficient due to the lack of information available to the Morehampton Road store manager. The source of stock outs and overstocking cannot be fully determined and there is little incentive for other store managers to accurately predict requirements as they are neither charged for the capital cost of excess stock (as no effective stock transfers system is in operation) nor fully penalised for stock outs (as they can draw on Morehampton Road stock to alleviate shortfalls). The other stores should begin to send defined orders to the Morehampton Road store immediately. Management should also put a policy in place regarding the other stores requesting products from the main store, for which, they have their own suppliers for. This should not be allowed as it results in the main store suffering from stock outs. The process should then be more controlled and give more responsibility to the other stores for their stock control. (Section 3.4, p 15)
The current process for replenishing shelves in the Morehampton Road store is inefficient. The process is labour intensive and there is an excessive amount of time spent making lists. The current process does not utilise any technology and is a completely manual process. The store manager estimates that 50-60 hours of labour a week are being wasted with the current process. As the resources to implement the recommended process are already in place, it should be implemented immediately. The benefits of the new process will accrue quickly. (Section 3.5, p 17)
## APPENDICES

<table>
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<th>NO.</th>
<th>CONTENT</th>
<th>PAGE</th>
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</thead>
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<td>Original Project Outline</td>
<td>A.1</td>
</tr>
<tr>
<td>B.</td>
<td>Interim Report</td>
<td>B.1</td>
</tr>
<tr>
<td>C.</td>
<td>Risk/Opportunity Analysis Scales and Maps</td>
<td>C.1</td>
</tr>
</tbody>
</table>
A. Original Project Outline

Client: Donnybrook Fair
Project: Creating Efficiencies within Stock Management Process
Location: Donnybrook, Dublin 4
Client Contact: Hugh Doyle, hd Doyle@donnybrookfair.ie
Dept. Contact: Aideen Keaney

Client Background
Donnybrook Fair is a privately owned premium food retailer. Currently they operate 5 retail stores and have plans of opening an additional 2 over the coming 12 months.

Project Background
Donnybrook Fair has grown organically, and is at a stage where some of their processes are inefficient.

All goods received from suppliers are accepted through the back stores. The proof of delivery (POD) is entered or scanned into the EPOS package for stock, pricing and accounting purposes. Once the POD is entered, the goods received note (GRN) is printed from the EPOS package and attached to the POD. The batches of POD’s are hand delivered to the Finance department daily where the invoice is matched to the POD and GRN. Discrepancies are reported to the supplier and the internal Buying department.

Currently, two full time employees enter the POD’s into the EPOS package for the 5 stores. Three full time employees post the invoices into the accounting package over a 5 day period every month. This is very inefficient.

Additionally, the main store-room for all stores is in the basement of the Morehampton Road store. This stock room needs to supply all other stores. At the moment the process is not defined, which has led to inefficiencies and over stocking of certain products.

Client Requirement
Developing a more efficient stock management process, including reviewing how stock deliveries are captured, and stock pricing are verified.

Additionally, the student will review the workflows involved in managing stock in the store rooms and in getting this stock to each shop floor.

What is involved for the student?
The project will involve the student undertaking current workflows for the stock management
process, and using their experience from Management Science to create a more efficient stock delivery process. In addition the student will look into systems that would eliminate excessive data entry by the team.
B. Interim Report

Management Science and Information Systems Studies

Project: Donnybrook fair stock management processes  
Client: Donnybrook fair  
Student: Stephen Galavan  
Supervisor: Frank Bannister

Review of Background and Work to Date

Donnybrook fair is a privately owned premium food retailer. Currently they operate 5 retail stores and they have plans to open an additional 2 over the next 12 months. They have grown organically and are now at the stage where some of their processes are inefficient. The main store-room for all stores is the basement of the Morehampton road store. This stock room needs to supply all other stores. The other stores have a most of their stock delivered directly to them. This process is not defined and has led to inefficiencies and over stocking.

The aim of this project is to find out the problems with the process at the moment and to define a process to remove these problems and make the stores more efficient.

I am at the moment organising meetings with some of the store managers. These meetings will allow me to pin-point the exact problems the stores are having with stock management at the moment and what the inefficiencies are. It will also enable me to map out the current processes being used.

This will allow me to investigate solutions to each of the problems with the current system. I will then be able to define a stock management process to allow the stores operate more efficiently and thus save time and money.

At this point through discussion with the HR manager I have found that the stock taking procedure is one of the inefficiencies. I have already begun investigating a solution for this problem and I have found one possible solution to the problem.

Up to now I have researched UML diagrams and process flow charts, along with common stock management problems that arise.

Terms of Reference

- To investigate the problem through discussions with the store managers.
- To research possible solutions.
- To map out the process as it exists.
- Define a new stock management process.
- Detail the problems and inefficiencies the new process will deal with.

Work to be done

The existing problems and inefficiencies need to be found. I will need to define the existing process using UML diagrams or process flow charts. The existing problems will need to be
investigated to find possible solutions. I will then have to define a new stock management process. The problems solved with the new process will be detailed in my report.

**Conclusions**

The project is still in the initial stages, as meetings are still to be set up with the store managers. Once I have had the opportunity to interview the managers, progress can begin to be made on the project.
C. Risk/Opportunity Analysis Scales and Maps

The scales used for the likelihood and impact in the risk analysis are provided here. The risk and opportunity maps are also provided.

C.1 Likelihood Scale

<table>
<thead>
<tr>
<th>Rating</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certain - 5</td>
<td>This is something that is going to occur every time</td>
</tr>
<tr>
<td>High - 4</td>
<td>It will often occur throughout the year</td>
</tr>
<tr>
<td>Moderate - 3</td>
<td>It will happen occasionally during the year</td>
</tr>
<tr>
<td>Low - 2</td>
<td>It is unlikely to occur during the year</td>
</tr>
<tr>
<td>Never - 1</td>
<td>This will almost never happen, may occur in exceptional circumstances</td>
</tr>
</tbody>
</table>

C.2 Impact Scale - Risks

<table>
<thead>
<tr>
<th>Rating</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant - 5</td>
<td>This will have a significant impact on the financial performance and reputation of the company</td>
</tr>
<tr>
<td>Serious - 4</td>
<td>The financial performance and the reputation of the company will be seriously damaged.</td>
</tr>
<tr>
<td>Moderate - 3</td>
<td>This will have a negative effect on the financial performance of the company and may cause damage to the company's reputation</td>
</tr>
<tr>
<td>Minor - 2</td>
<td>This will cause some minor losses to the company but is unlikely to effect the customer's perception of the company</td>
</tr>
<tr>
<td>Incidental -1</td>
<td>There may be some small costs associated with this but there will be no external effects on the company</td>
</tr>
</tbody>
</table>
### Impact Scale - Opportunities

<table>
<thead>
<tr>
<th>Rating</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant - 5</td>
<td>This will have a significant impact on the financial performance and reputation of the company</td>
</tr>
<tr>
<td>Serious – 4</td>
<td>The financial performance and the reputation of the company could be considerably improved</td>
</tr>
<tr>
<td>Moderate - 3</td>
<td>This will have a positive effect on the financial performance of the company and may also improve the reputation of the company</td>
</tr>
<tr>
<td>Minor - 2</td>
<td>This will bring some minor improvements to the financial performance of the company but is unlikely to effect the customer’s perception of the company</td>
</tr>
<tr>
<td>Incidental -1</td>
<td>There will be no external effects on the company but will bring small improvements to the financial performance of the company</td>
</tr>
</tbody>
</table>
C.4 Overall Risk Rating

This table shows the scores on the risk map with 1 being the lowest and 25 the highest. The score is obtained by multiplying the impact by the likelihood of the risk.

<table>
<thead>
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<tbody>
<tr>
<td>1.Incidental</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.Minor</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>3.Moderate</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>4.Serious</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>5.Significant</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>
C.5 Risk Map

<table>
<thead>
<tr>
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<th></th>
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<th></th>
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<tbody>
<tr>
<td>5. Significant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Serious</td>
<td></td>
<td></td>
<td></td>
<td>B(9)</td>
<td>C(12)</td>
</tr>
<tr>
<td>3. Moderate</td>
<td></td>
<td></td>
<td>B(9)</td>
<td>C(12)</td>
<td></td>
</tr>
<tr>
<td>2. Minor</td>
<td></td>
<td></td>
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<td></td>
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C.6 Opportunity Map

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LIKELIHOOD