DATA RICH, EXTRACTION POOR: LEVERAGING POINT OF SALES DATA FOR EFFECTIVE DECISION MAKING

by

Tiffany Gordon
Bachelor of Science, University of the West Indies, 1999
and
Nathalie Thibault
Bachelor of Commerce, Concordia University, 1999

PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION

In the Faculty of Business Administration

© Tiffany Gordon and Nathalie Thibault 2004

SIMON FRASER UNIVERSITY

August 2004

All rights reserved. This work may not be reproduced in whole or in part, by photocopy or other means, without permission of the author.
Approval

Name: Tiffany Gordon
Nathalie Thibault

Degree: Master of Business Administration

Title of Project: Data Rich, Extraction Poor: Leveraging Point of Sales Data for Effective Decision Making

Examining Committee:

Dr. Gary Mauser
First Reader
Professor of Marketing
Faculty of Business Administration
Simon Fraser University

Dr. Bert Schoner
Second Reader
Professor Emeritus
Faculty of Business Administration
Simon Fraser University

Date Approved: August 5, 2004
Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author’s written permission.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

Bennett Library
Simon Fraser University
Burnaby, BC, Canada
ABSTRACT

The purpose of this project is to determine the information needs of a sample of executives at Company XYZ. It specifically focuses on leveraging the data extracted from the company’s Point of Sales system to facilitate effective decision making. Reviewed literature posits that having managers and executives utilize data more efficiently can lead to numerous benefits such as more informed decisions and increased customer satisfaction.

Through detailed interviews, 17 executives describe their information requirements, the information currently available to them as well as the obstacles they face due to incomplete, inaccurate or unavailable data. The Information Technology department was also interviewed in order to identify gaps between user needs and the current technological capability of the firm. The information gathered is then used to identify the areas for improvement and to determine common information needs throughout the organization and the reports required to better extract business value from this data.

While each executive’s information requirements varied according to the department, many of these needs were similar and could be met through a few detailed reports. It is interesting to note that each department extracted different information from these standard reports. The reoccurring theme that emerged from this study is the need for timely, accurate and easily accessible information. Furthermore, executives wanted trending information, both summary and detailed reports and more accurate costing information.
ACKNOWLEDGEMENTS

We would like to thank our senior supervisor, Dr. Gary Mauser, for his support throughout this project. His guidance has kept us motivated to complete this project successfully. We would also like to thank our project coordinator, Dr. Bert Schoner for providing us with this interesting and challenging project.

We extend our sincerest gratitude to the executives, managers and support staff at Company XYZ for their time and candour in answering our questions. We appreciate the opportunity they gave us to learn about their business and the information required to make strategic decisions. Special mention must be made of Lisa at Company XYZ who scheduled all interviews and ensured that we had all the information we needed. Thank you for making our project a success.
TABLE OF CONTENTS

Approval ............................................................................................................................ ii
Abstract ............................................................................................................................ iii
Acknowledgements .......................................................................................................... iv
Table of Contents ............................................................................................................. v
List of Tables ..................................................................................................................... vii
1. Introduction .................................................................................................................... 1
2. Literature Review .......................................................................................................... 3
   Executive Decision Making ............................................................................................ 3
   The Role of the Executive ............................................................................................. 3
   Executive Decision Making .......................................................................................... 5
   Decision Making Models .............................................................................................. 7
   Getting the Right Information ....................................................................................... 10
   Point of Sales Systems .................................................................................................. 15
   Uses of a Point of Sales System ................................................................................... 16
   Executive Information Systems .................................................................................... 19
   EIS Defined .................................................................................................................... 19
   EIS Usage by Executives .............................................................................................. 20
   EIS Keys Success Factors ............................................................................................. 21
   Determining Information Requirements ........................................................................ 24
   Data Mining .................................................................................................................. 29
   Data Mining Tools ......................................................................................................... 29
   Key Uses of Data Mining in Marketing ......................................................................... 31
   Prior Research on Technology Adoption ...................................................................... 32
   Theories and Models ..................................................................................................... 33
   Best Practices ................................................................................................................ 38
3. Research methodology .................................................................................................. 41
   Sampling ......................................................................................................................... 41
   Procedure ....................................................................................................................... 42
   Data Analysis .................................................................................................................. 45
4. Results ............................................................................................................................. 46
   The Chief Executive Officer ......................................................................................... 46
   The Chief Financial Officer ......................................................................................... 51
   Company XYZ in the United States ............................................................................... 53
   Company President ........................................................................................................ 55
   Corporate Services ........................................................................................................ 58
   Purchasing ....................................................................................................................... 65
   Corporate Chef ............................................................................................................... 71
   Marketing ......................................................................................................................... 73
   Western Business Management Unit ............................................................................. 76
Vice-President of Finance and Administration .................................................................80
Information Technology ..................................................................................................82
Reporting Barriers ...........................................................................................................83
IT Tools ..........................................................................................................................84
IT Strategy and Initiatives ...............................................................................................84

5. Discussion and Recommendation ...............................................................................86
   Common Information Needs .......................................................................................86
   Timely Information .....................................................................................................86
   Easy Access to Information ......................................................................................87
   Historical Data for Trends .........................................................................................87
   Summarised Data and Drill-down Capabilities .........................................................88
   Information Displayed by Day Parts .........................................................................89
   Reliable Data ..............................................................................................................89
   What-if Scenarios ......................................................................................................89
   Statistically Significant Data .....................................................................................90
   Food Services Database ............................................................................................90
   Corresponding Supplier and Company Codes .............................................................90
   Recommendations .....................................................................................................91
   Areas for Improvement by Report ..............................................................................94
   Rate of Sales Report ....................................................................................................94
   Rate of Sales Report Recommendations .....................................................................95
   Marketing Promotion Report ......................................................................................98
   Marketing Promotion Report Recommendations .......................................................99
   Monthly Sales Report ..............................................................................................101
   Monthly Sales Report Recommendations ...............................................................101

6. Summary and Conclusion .........................................................................................104

Appendix A List of Interviewees ..................................................................................106
Appendix B Questions for Qualitative Interviews .......................................................107
References .....................................................................................................................109
LIST OF TABLES

Table 1: Decision Making Models ................................................................. 8
Table 2: Methods of Determining Information Requirements ..................... 28
Table 3: Data Mining Analysis Tools ............................................................ 30
Table 4: Technology Adoption Influencers ................................................. 36
Table 5: Common Information Deficiencies .............................................. 93
Table 6: Common Areas for Improvement – Rate of Sales ......................... 97
Table 7: Common Areas for Improvement – Marketing Promotions ............ 100
Table 8: Common Areas for Improvement – Monthly Sales ....................... 103
1. INTRODUCTION

Company XYZ is a global restaurant chain having franchises in Canada and the US. The organization has been growing rapidly at a rate of X per cent over the last 10 years and is expected to continue with this trend. The company’s information technology infrastructure however has not been able to keep up with this fast paced growth. Company XYZ is facing the far too common problem of having lots of raw data but not being able to turn it into actionable information in a timely manner. Data is a valuable asset as it enables organizations to increase revenues, and/or decrease costs by helping managers to make more informed decisions. Decisions can be negatively affected when needed information is unavailable. Currently, the organization is receiving data from its franchises through a Point of Sales system. However, it is unknown whether this data is being utilized to its full potential to aid managers with their decision making.

The purpose of this project is to determine the information needs of a sample of executives and managers. This report will specifically focus on internal sales data from the Point of Sales system. The information currently available to these decision makers, the information required and the resulting gaps will be identified. The information gathered in this report will be used to determine common information needs throughout the organization in order to better extract business value from this data. Having managers and executives utilize data more efficiently can lead to numerous benefits such as more informed decisions and increased customer satisfaction.

This paper is organized into six sections. Section one provides a brief introduction. Section two comprises a literature review of key topics relevant to the study of executive information needs. The process of executive decision making as well as the role of executives in an organization is examined. Point of Sales (POS) systems are described in order to get a better understanding of their functions and capabilities. Information system tools developed to extract
and manipulate data from POS systems are also discussed. More specifically, the uses and functions of Executive Information Systems (EIS) and data mining tools are outlined. As this project deals with technology, models describing the technology adoption process are delineated. Lastly, best practices in the retail industry as to how to exploit data concludes the literature review. Section 3 describes the methodology used to determine the information needs of executives at Company XYZ. Section 4 outlines our results in terms of the information needs of each department and person interviewed. Section 5 examines the identified information needs and delineates commonalities between the various departments. Gaps between the information requirements and the information available are presented and recommendations are made as to how Company XYZ can reconcile these. Lastly, Section 6 presents a summary and concludes this paper.
2. LITERATURE REVIEW

Executive Decision Making

Since this report deals specifically with the information needs of executives, it is important to understand the role that executives play in an organization. This section outlines the executive's responsibility for developing an organization's strategy and also examines the executive decision making process, decision making models, and the information needed to make well thought out strategic decisions.

The world of business is getting more and more competitive. Today it seems as if mergers, acquisitions, downsizing, expansions and the like are a natural part of the business environment. Firms are faced with consumers who have ready access to information and to alternate and similar goods and services from companies across the world. Firms are forced to not only compete with companies in their backyards, but also to compete regionally and globally. In order to distinguish itself from the crowd of competitors, a firm must develop a unique strategy to ensure that it is able to pull them above the din.

In a very real sense, strategy is the determination of the basic purposes and managerial objectives of the organization, along with the adoption of particular courses of action and the allocation of specific resources. The firm's top management are entrusted with the creation of this strategy. These executives decide which activities take place and how they must be executed in order to gain a strategic competitive advantage.

The Role of the Executive

While firms may vary on who they define as an executive, there are some common characteristics. Understanding who executives are and what they do can help to determine their information needs.
Executives may manage an entire organization, as in the case of the Chief Executive Officer (CEO), or a sub unit of the organization such as the Executive Vice President of Corporate Services. As a result, they usually consider the welfare of the entire organization as opposed to that of any single sub unit. Oftentimes an executive’s responsibilities span more than one department or functional area. Executives are therefore required to look at how their sub units can help in achieving the organization’s overall objectives. As part of their responsibilities, executives establish policies, represent the firm in its interactions with the external environment and keep the internal environment efficient and effective (Watson et al., 1997).

Executives are more future-oriented than other managers as they operate at the strategic planning level of the organization. They are involved in planning with a time horizon of 5 or more years. This planning must be done carefully as any decisions made at the executive level has considerable effects on the financial, human and business facets of the organization (Watson et al, 1997). These decisions are critical to the firm and its competitive strategy. Effective organizations are managed by executives who make effective strategic decisions (Harrison & Pelletier, 1998).

According to Hambrick and Snow (1977, p. 109),

Strategic decisions are those which normally fall within the purview of top management. Broadly speaking, strategic decisions are those which are important to the organization.... Because of their importance, strategic decisions must be closely linked with each other to form a consistent pattern for directing and unifying the organization.

This pattern of decisions reflects the strategy of the organization (Harrison & Pelletier, 1998). In light of this, strategic decision making is the most important role of company executives.

Successful companies are so due to their decision making in that they ‘outdecide’ competitors by making better decisions faster and implementing them more effectively...
(McLaughlin, 1995). An executive must also keep in mind that any decisions made at his level have a waterfall effect on the decision making of every individual and unit below him. Decisions made at the executive level set the strategic direction of the company and commit the company’s resources and activities towards attaining these long term objectives. If the decision making at the executive level is effective, the choices made by lower levels of management will also be effective. The reverse also holds true. Ineffective executive decision making leads to ineffective managerial decision making (Harrison & Pelletier, 1998).

The executive’s job not only involves making decisions personally, but ensuring that others in the organization do as well. The nature of executive decisions may have the following characteristics (Watson, Houdeshel & Rainer, 1997):

- Non programmed, novel, consequential and non-repetitive
- Long time horizons
- High degree of discontinuity
- Abstract data and causal relationships
- High uncertainty, ambiguous preferences and no assumptions

**Executive Decision Making**

Bonabeau in his 2003 Harvard Business Review paper, “Don’t Trust Your Gut”, pointed out the challenges involved in making decisions in today’s contracting global village. He stated, “Making high stake business decisions has always been hard. But in recent decades, as the complexities of global commerce have deepened, it’s become tougher than ever” (Bonabeau, 2003, p.116).

Managers are now faced with a multitude of decisions that need to be made as well as massive amounts of data that need to be analyzed. The time they have to assimilate this data and
make these decisions has however shrunk, and decision makers can only expect that this will get worse (Bonabeau, 2003). "The volume of data that feeds business decisions will rise by orders of magnitude in the coming years, and yet decisions will have to be made more and more quickly" (Yager, 2004, p.54). However the ability to make high quality decisions quickly and on a frequent basis is the cornerstone of effective strategy (Eisenhart, 1999).

Faced with these challenges and the pressure to develop effective strategies, executives must find the right path for their companies and make the right decisions. Each individual, department and company may use different methods in arriving at their decisions. The jury is still out on whether making such crucial decisions based on intuition or gut feeling is reliable. This practice is however more widespread than many would care to admit. In fact, in May 2002, executive search firm Christian and Timbers conducted a survey which showed that 45% of corporate executives relied on instincts rather than facts and figures to make their business decisions (Bonabeau, 2003). Other studies have found that executives rely on intuition to solve complex problems when logical methods prove insufficient. The practice becomes more common as people climb higher in the organization and develop better honed business instinct (Hayashi, 2001).

Decision makers may argue that basing decisions on intuition is subjective and not sufficiently analytical, but it presents executives with a cheaper, quicker and arguably effective way of making a decision (Overell, 2001). Based on the short time frames in which executives have to make decisions, intuition may prove useful when there is little time to evaluate all the data, options and alternatives (Hayashi, 2001).

Opponents of this method of decision making argue that while intuition may be useful in the process, it is not a substitute for reason and analysis. The gut can prove to be unreliable and fickle and it is best to use empirical evidence to make a decision (Bonabeau, 2003). Regardless of
how executives make their decisions, whether by intuition or data analysis, the process usually has some common characteristics.

**Decision Making Models**

In this section we will review three decision making models. Table 1 presents a comparison of the steps presented in each of these models. The first model by Harrison and Pelletier (1998) proposes that the decision making process is comprised of components known as functions. These functions, while contributing to the overall process, have certain properties of their own. The functions are setting objectives, searching for alternatives, comparing and evaluating alternatives, choosing, implementing and following up. Together they contribute to the effectiveness of the whole decision making process (Harrison & Pelletier, 1998).

The second model, put forward by Bonabeau parallels the first four functions in the Harrison and Pelletier (1998) model and posits that there are two tasks involved in making a decision, namely, searching for potential solutions and evaluating the solutions in order to choose one. Searching for solutions entails framing the problem and establishing a set of assumptions. The number of alternative solutions varies with the complexity of the problem or the decision. An easy decision would therefore have just a few alternatives to consider (Bonabeau, 2003).

The third model has perhaps the most sweeping categories with its three stages simply being gathering the right information, making a good decision and implementing the decision. Each stage must be successively concluded in order to generate an effective decision (McNeilly, 2002).

The Harrison and Pelletier (1998) model is the most comprehensive with six stages in comparison to the four and three respectively proposed in the Bonabeau (2003) and McNeilly (2002) models. The following paragraphs examine the three models by looking at their similarities and differences.
### Table 1: Decision Making Models

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Set managerial objectives</td>
<td>Frame the problem</td>
<td></td>
</tr>
<tr>
<td>Search for alternatives</td>
<td>Set working assumptions</td>
<td>Gather information</td>
</tr>
<tr>
<td>Compare and evaluate alternatives</td>
<td>Evaluate solutions</td>
<td></td>
</tr>
<tr>
<td>Choose</td>
<td>Choose</td>
<td>Make good decision</td>
</tr>
<tr>
<td>Implement</td>
<td></td>
<td>Implement</td>
</tr>
<tr>
<td>Follow up and control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Set Managerial Objectives**

   Every decision making process has a purpose and therefore must be guided in a certain direction. To this end, objectives should be clearly defined. They serve as a benchmark for measuring, comparing and evaluating the effectiveness of the process for accomplishing the organizational goals (Harrison & Pelletier, 1998). Framing the problem around which the decision must take place serves as an effective precursor to staging objectives.

2. **Search for Alternatives**

   This function involves drawing certain assumptions regarding the problem and requires executives to ask the following questions. What are the implications of the problem? How will it affect the company? It also involves drafting possible solutions to these problems. This is done by searching both inside and outside the organization for information, which is then formulated into alternative solutions that are able to meet the defined objectives.

   The first two functions, setting managerial objectives and searching for alternatives are covered in McNeilly’s (2002) first stage of the decision making process of ‘gathering information’. This function will be explored in more detail further in this paper due to its direct impact on the study conducted at Company XYZ.
3. Compare and Evaluate Alternatives

Executives must now explore each alternative solution in depth to determine which best meets the objectives. Each alternative presents a different outcome, therefore the pros and cons of each must be evaluated against their linkages to the objectives and strategy of the company. Questions that need to be asked at this point are the following. Do the proposed actions fit the strategy? Does the new information coming in set off alarms about the need for a change in strategy? (McNeilly, 2002). Alternatives that only partially fulfil or do not fulfil the objectives should be disregarded (Harrison & Pelletier, 1998).

4. Choose

Having explored the alternatives and their attached outcomes, the executive must now make a choice, keeping in mind that as mentioned earlier any executive decision leads to the commitment of the firm’s resources and activities toward achieving this objective. Ideally the best decision is one in which the solution furthers as many objectives as possible without jeopardizing the attainment of any single objective (Harrison & Pelletier, 1998). These last two functions of comparing, evaluating and choosing alternatives are captured under the ‘make a good decision’ category of the McNeilly (2002) model.

5. Implementation

Bonabeau (2003) fails to go beyond the choice function, unlike the other two models which propose an implementation function. In fact Harrison and Pelletier (1998) concede that it is common for decision making literature to fail to advance beyond the act of choosing. A decision cannot be effective until it is put into action.

It is not enough to select the best alternative. If the decision is not adequately implemented, the favourable outcome will not be achieved. Effective decision makers devise plans to carry out their decisions. They anticipate the likely setbacks and are ready with countermeasures (Wheeler and Janis, p.9).
6. Follow-up and Control

Harrison and Pelletier (1998) go even further, by suggesting a sixth function of follow-up and control. This process is a check and balance system to ensure that the solution did indeed attain the managerial objectives that were set (Harrison and Pelletier, 1998).

Regardless of the decision making process in which an executive indulges, information plays a critical role in strategic decision making. Strategic information feeds executive level planning and guides structured operations with the goal of achieving long term objectives (“Management Information Systems”, 1987). External information about environments such as markets, industry, customers and worldwide finance for example inform the strategy of the organization. Internal information such as productivity reports direct the tactics driving the organizational strategy (Drucker, 1995).

Getting the Right Information

Earlier in the section we discussed the three stages of McNeilly’s (2002) decision making process which involves getting the right information, making a good decision and implementation. The study conducted at Company XYZ focused on using data pulled from the Point of Sales system to aid executives in their decision making. As a result we will further explore the first step in the decision making process of gathering the right information which executives need.

Every decision must be supported by relevant data (Harding, 2003). Executives at successful companies are provided with accurate and timely data so that they can make good decisions, take appropriate action and avoid problems (“Management Information Systems”, 1987). With so much data now available, executives may get overwhelmed, and extracting the right information may prove to be daunting (Etzioni, 1989). In order to get at the right information when faced with this plethora of data, executives need to determine what kind of
information they require. They must ask themselves questions regarding the types of decisions they need to make, the problems they are facing and the solutions or actions they would like (Meri, 2000). Successful decisions are characterised by identifying information needs, finding the information and getting it quickly to the relevant decision makers (McNeilly, 2002). With the intention of getting a better understanding of this dilemma, we will now examine the information needs of executives.

**Types of Information**

The information that executives need can be classified into there main categories: knowledge about the competition, knowledge about the marketplace in which the company operates and knowledge about the executives' own company (McNeilly, 2002).

1. *Knowledge about the Competition*

   A company’s strategy will be influenced by competitors in its market. Executives are interested in knowing for example information regarding their rivals’ financial results, company structure, products and production costs. More importantly they would like to know the competition’s strategy. What market are the competitors targeting? If the executive’s company took a certain action, how would its rivals react? What are competitors capable of doing? It is important to have a keen sense regarding the competition in order to plan effectively. Executives should know what competitors are capable of doing and what they are currently planning on doing.

   Competitive information may be gathered from various sources. These include readily available documentation such as trade publications, annual and quarterly reports, press releases and advertising. Other sources include interviews given by the executives in the competing company as well as visiting competitor business sites and stores where this is possible (McNeilly, 2002).
2. Knowledge about the Market

Sometimes major changes start outside an organization and it is therefore imperative to have intimate knowledge about the business environment and the marketplace in which the company operates. External information is useful for learning about changes in the industry, technological breakthroughs, changes in consumer trends, tastes and attitudes as well as other characteristics of the market ("Management Information Systems", 1987). Failure to keep up with changes in an industry can be detrimental to a company as it may become obsolete and unable to compete in an industry that had changed while it was not paying attention. Market information is crucial to such decisions that are related to a new market entry into a new economy or country. Serious business failure occurs when companies make assumptions concerning certain conditions including taxes, legislation, market preferences and distribution channels. Many times the reality is contrary to those assumptions (Drucker, 1995). Market information may be derived from trade and industry reports, trade journals or market research.

3. Information about the Company

Of the three types of information put forward by McNeilly (2002), the most relevant to this study is information about the company. All of the data examined in this research is pulled from Company XYZ’s POS system, which holds data relating to the operation of the company and its franchisees. It is important that executives assess the strengths and weaknesses of their company in order to derive strategies that are within their capacity.

Executives are charged with the responsibility of managing companies as ‘going concerns’ or in other words creating wealth for the company. In order to do this they need four sets of information relating to foundation, productivity, competence and allocation of scarce resources. This is the executive’s kit of diagnostic tools for managing the business (Drucker, 1995).
Foundation information may be likened to a routine physical examination. If the results are normal they do not say much, however an abnormality indicates a problem and the need for treatment. These diagnostic tools include the company’s cash flow and liquidity projection, interest payment coverage, total receivables and sales.

The productivity diagnostic tool measures the output of each factor employed in the operation of the business. It lets an executive know which product, service or operational activity is efficient and provides a tool for measuring the value added over cost.

The competence information tool relates to the company’s core aptitude for building customer value. It assesses the company’s unique attributes and capabilities which may be instrumental in establishing a leadership position in the market. Faced with scarce resources of people and capital, an executive needs information to effectively proportion these two vital resources with the goal of maximising efficiency and wealth (Drucker, 1995).

In more detail, an executive needs information that pertains to operations, finance, strategy, control, structure as well as some external information. The operating information relates to anything that aids in the day to day operations of the company such as scheduling and sales. Financial information gives an overview of the financial health of the company and is usually of great interest to management and other parties such as shareholders. Information relating to control is necessary to set standards and correct deviations that may occur and is usually associated with production, inventory and security. Information regarding the organizational structure such as resource allocation and differences in decision making styles may be classified under structural information. This is a useful tool to monitor and resolve conflicts that may arise in these activities. Executives need crucial information to structure high level planning for achieving long term objectives. Such information is classified as strategic information ("Management Information Systems", 1987).
The information needs of the executive may vary depending in his or her role, company and industry. Whatever information is needed, in order for it to be useful it must embody certain attributes.

The Attributes of the Information Needed

Rather than reports from many departments that are disconnected and formulaic, executives prefer summaries that consider facts from all sources. They want to be able to break this information into a high level view that will support them in making quick and accurate decisions (Yager, 2004). Information has many different attributes such as timeliness, accuracy, scope, time horizon, relevance, level of detail or summarization, source, orientation and the ability to be quantified to name a few (Watson, Houdeshel & Rainer, 1997). The importance of these attributes may vary depending on the level of the decision makers and their personal preference. Attributes that executives need in the information they receive will be examined next.

In order to facilitate quick and effective decision making, the information that is brought to the executive must be relevant to the issue being considered. This helps to avoid the feeling of drowning in data which slows the decision making process. Executives must also be able to act on the information that is sent to them and therefore information relayed should be within the scope of their accountability. The information sent must also be at a level that is appropriate for the executive and should only be as detailed as needed. Needless to say the information must be accurate and credible. Decision makers must feel confident in the information that they are considering. If they feel otherwise this information should be disregarded. Lack of credible information means a lack of confidence in the evaluation of the alternatives and consequently the outcomes of the decision. Information should be collected and calculated in a consistent manner from the same sources. This allows the information to be reproduced and a history created. Information with a historical perspective allows executives to track trends and extrapolate into the future (Meri, 2000). Information must be organized in a manner that executives will find useful.
Unless organized, information is still data. The manner in which information is organized may be dependent on the company, the issue, the job of the executive and the decision to be made (Drucker, 2001).

Another important attribute of information is timeliness. Information may be readily available but it is useless unless in the hands of the right person. An infrastructure must be in place to transmit the right information speedily to the decision maker in order to facilitate quick effective decisions (Drucker 2001). In light of their growing responsibilities, the pressures to attend to many different decisions and the plethora of information, executives need an effective way to manage this all. Such tools as Executive Information Systems (EIS) provide them with high quality information that enable a more efficient and effective decision making process.

**Point of Sales Systems**

Company XYZ is concerned with leveraging the data from their Point of Sales (POS) system to make more informed executive decisions. In order to gain a better understanding of how the POS system may be useful in achieving this goal, the ensuing section presents an overview of current Point of Sales systems, their functionality and uses.

A Point of Sales (POS) is a single system which incorporates the desktop, payroll, food stuff inventory and administrative reports and sales (“Powering the Point of Sales”, 2000). A POS system becomes a more powerful management tool when coupled with an Executive Information System which enables it to generate useful information reports to aid in the executive decision making process and help build the company’s competitive strategic advantage (Preweitt, 1996). Understanding data from the POS system “ultimately clarifies the bottom line, knocking guesswork out of the equation, allowing better control over inventory, bar revenues, labour scheduling, customer traffic and service” (Sheridan 2000, p.98). However, executives must be mindful of the limitations of a POS system. POS systems can only output data that has been
inputted in the first place. The more data that is collected, the more information can be pulled from the system (Durocher, 1997). An executive cannot expect to get a report displayed in a certain way if the POS system has not collected that data or if the data is not organized in the manner that is needed to generate that report.

Today the differences between the many off the shelf POS systems are negligible. Competition is leading POS system providers to offer more and more comprehensive packages. POS systems now offer real time tracking of menu availability and meal durations (Ansel & Dyer, 1999) as well as sales forecasting, customer count tracking, tip reporting and labour scheduling capabilities (Prewitt, 1999). In many cases the POS system can also be integrated into a table management system which manages reservations, floor plans and wait lists.

Uses of a Point of Sales System

POS systems record sales and issue register receipts, help control inventory, monitor computer performance, manage customer programs and allow sharing of information with other franchisee stores (Strazewski, 1996). It gives the retailer the ability to manage information in a timely manner in order to know what is selling and what is not selling. This information is available from a broad regional level to a detailed unit level (Strazewski, 1996). Uses of POS systems can be divided into the following 5 categories. Each category is illustrated by examples in the retail industry.

1. Data Analysis and Reporting

The reporting facilities in POS systems have improved and management is now able to produce standard reports, some displayed graphically, in order to aid in analysis and decision making (Ansel & Dyer, 1999).

- Main Street Restaurant’s system provides a configurable web based “snapshot” of several summarized reports which includes such areas as gross sales, customer counts and
average cheques for the previous day as well as a week to week comparison of daily sales of each restaurant. The snapshot also includes a pie chart of each restaurant’s contribution to overall sales. Managers are able to set alerts in the systems to notify them if for example sales fall below a certain level or if a high number of transactions are voided (Liddle, 2002).

- CKE Restaurants, operators of Hardee’s, use an online analytical processing system known as MetaCube, which allows decision makers to answer sophisticated operational and marketing questions using data query and analysis.

2. Costing and Purchasing

The POS system’s inventory procedures can be used to track recipe costs, allowing for close monitoring of inventory losses and control of theft (Sheridan, 2000).

- Executives at The Cheesecake Factory are able to track trends from their data warehouse that will inform their menu mix. They also have the ability to know which ingredients sell the most. With this information they are able to negotiate purchasing contracts with their suppliers (Ansel & Dyer, 1999).

- Grouse Mountain Grill in California uses ChefTec which enables them to write, store and scale their recipes, and calculate recipe costs and optimum menu prices. They are also able to track purchases and price variances and produce reports using purchasing history in recipe costing by last, highest or average prices. The system is also able to send online ordering files to distributors. ChefTec calculates nutritional values for recipes and compares them with USDA guidelines.
3. Customer Service Management

The customer service component of POS systems allows operators to up-sell and capture customer feedback. The POS system is able to prompt servers to up-sell items. For example if a server is selling beer, he or she may be prompted to offer premium beer rather than regular beer.

- In 1996, Darden Restaurants, operators of Red Lobster and The Olive Garden, re-keyed its POS system to produce every 50th or 60th guest with a special cheque. The cheque directs customers to a toll free line which they can call to give their comments about their dining experience. Respondents are lead through a set of automated questions which they answer by pressing buttons on a touch tone phone. They also have the option of speaking with a representative. The company was able to get the results of the survey immediately and found the process more effective than conducting mystery shopper exercises.

4. Labour Management

POS systems can be used for labour scheduling and management. Each employee uses his or her access code or card to log in and out of work. The system also maintains sales dollars and volume of items served. This combined with labour hours present a base for developing a schedule that maximises staff productivity and restricts overtime (Durocher, 1999 & Sheridan, 2000).

5. Training

Due to the usual high turnover of line staff in the retail restaurant business, POS systems can be used to reduce the training time of new employees. The recipe and method of preparation can be built into the system and the employee can be guided step by step ("Powering the Point of Sales", 2000).
Executive Information Systems

The most commonly accepted interpretation of the acronym EIS is “Executive Information System”. Since this project deals with understanding the information needs of executives at Company XYZ, it is important to review tools, such as EIS, that are currently used by executives.

EIS Defined

EIS are defined as “computer-based information delivery and communications systems for senior managers” (Paller and Laska, 1990, p.2). They help executives with their coordinating, planning and control functions within an organization (Bajwa et al., 1998). EIS has emerged from senior managers’ need for easy access to critical internal and external information. Executives needed a system to help them extract useful information from large amounts of data in order to increase organizational effectiveness. EIS originally appeared during the mid-1980s. Its function mainly involved tracking key performance indicators and success factors. These early EIS provided high-level information with little detail and were mainly used by executives (Watson et al., 1997).

EIS have now evolved to include more information such as financial, customer and external data. Users can also drill-down from summarized information to a finer level of detail. The use of EIS has expanded to include other managers and analysts thus improving information access throughout the organization. Due to this widespread usage of the system, it has been suggested that EIS should stand for “Everybody’s Information System” or “Enterprise Information System” (Watson et al., 1997). Another key feature of a modern EIS is flexibility in that the application can be customized to meet each individual’s specific information needs. Information therefore is provided to executives in the format that they prefer. EIS can also filter, track and output critical information, analyze trends, and create exception reports. Modern EIS
are also more user-friendly and can be used directly by executives without the help of IT (Watson et al., 1997).

Another term that has been used interchangeably with EIS is ESS (Executive Support System). ESS implies that other supporting functions such as electronic communications, decision support systems and query languages are included (Rockart and DeLong, 1998). This distinction however is not crucial as both EIS and ESS focus on executives as their primary user.

**EIS Usage by Executives**

The following example is intended to illustrate how an EIS can help Company XYZ become more efficient and effective in utilizing its Point of Sales data.

The EIS at a fast food chain allows the chief executive to examine actual performance versus plan and to project that into the future by comparing the results against several key performance indicators. Further, the CEO directly looks at marketing results and calculates, among other things, the cannibalization effect that a new product will have on existing menu items, thus quantifying net new business. The system is also used to model the many variables that impact each restaurant’s operating and financial performance. Individual menu item sales can be tracked to see when to change or delete an item in response to market demands (Stamen, 1992, p.24).

EIS can be used by executives to scan information or to answer specific questions. Vandenbosch and Huff’s (2001) study found that 75% of executives surveyed used an EIS solely to monitor performance or to find an answer to a specific question. This type of usage is seen by executives as increasing efficiency since information is easily available in a timely manner. Using an EIS to scan information can help executives find new insight into the business, challenge preconceived ideas and discover hidden opportunities (Vandenbosch and Huff, 2001). This second type of usage is seen by executives as increasing efficiency as well as organizational effectiveness.
EIS Keys Success Factors

The factors leading to successful implementation of EIS were originally studied by Rockart and DeLong (1988). Their study looked at the implementation of EIS in thirty organizations and identified eight key factors that appeared to positively affect the success rate of EIS implementations. Subsequently, many other researchers (Paller and Laska, 1990; Rainer and Watson, 1995; Salmeron, 2003; Poon and Wagner, 2001) confirmed these original findings and two additional success factors have been added. Descriptions of these ten key success factors are provided below.

1. Choosing the Right Executive Sponsor

An executive sponsor or project champion needs to be sufficiently committed to the EIS implementation. Sponsors are defined by Connor (1992) as people having the ability to sanction and legitimize change within an organization. Sponsors should have power over the targets of the change and must feel unhappiness and pain with the current status quo. Project sponsors should be eager to support the change initiative publicly, be willing to make the needed sacrifices for change to occur and be able to commit the appropriate resources to the change. Sponsors should be willing to take ownership of the project and continually track progress to ensure success. Lastly, sponsors should have a clear vision of what the organization will look like as a result of the change. They must understand who will be affected by the change and the long-term affects on the organization.

2. Having an Operating Sponsor

An operating sponsor is responsible for the day to day activities required to implement the EIS. This person will act as the project manager and work alongside the executive sponsor to ensure a successful implementation. Operating sponsors must not only possess technical skills but
must also have great interpersonal skills in order to empower and excite employees affected by the change.

3. **Having a Competent EIS Support Staff**

EIS support staff are responsible for developing and maintaining the system. They must have technical skills but also need business and interpersonal skills to interact with top executives. Xu and Kaye (2002) argue that executives require more information support rather than technical support. Information specialists should be used to scan, update, analyze and format information for executives. The debate continues on whether or not systems should be designed for direct use by executives since many delegate the responsibility of generating reports to their middle managers.

4. **Choosing the Right Technology**

It is important to select hardware and software that meet the specific requirements of executives. Executives have varying work styles and environments and therefore need a system that can be customized. In the past, EIS failure could be attributed to the system’s lack of flexibility, its slow response time and its lack of data dependability (Bartholomew, 1997).

5. **Managing the Data**

Executives and managers must feel confident that the data they are using to make decisions is accurate and reliable. Since data must be pooled from several internal and external sources, there is a lot of room for inaccuracies to arise. Data must therefore be well managed to ensure that it is accurate, consistent, timely and relevant.

6. **Having a Specific Business Objective**

An EIS should only be implemented if it solves a business need or helps to meet a business objective. This objective must be clearly identified and can range anywhere from
improving product quality to increasing company responsiveness to customers. It is also important to specify how an EIS can help the organization meet business goals.

7. Managing Organizational Resistance

According to independent research, the rate of failure for organizational change initiatives hovers around 70 per cent (Miller, 2002). Some of these failures can be attributed to poor strategy, but the majority are caused by failures in execution. Manning (2002) finds that management's inability to get buy-in from key targets of the change is a major reason for project failures. The organization must be ready for political resistance to the implementation of an EIS. A key factor in implementing successful change is having strong leadership to ensure that employees are ready, willing and able to participate in the change. An organization's ability to lead and manage resistance to change is therefore essential to its success.

8. Managing System Evolution and Spread

An EIS must be able to evolve as the needs of the users change. Furthermore, it is not uncommon for the use of an EIS to spread to support staff. It is therefore important to continually track new information requirements and adapt the system accordingly.

9. Using a Prototype Approach

The idea behind prototyping is to develop a system quickly based on initial requirements in order to get feedback from users. An evolutionary development method leads to EIS success since users typically find additional requirements through product usage (Paller and Laska, 1990; Rainer and Watson, 1995). Therefore prototypes are built to gain better insight on information requirements and give executives a taste of the system's capabilities.
10. Obtaining Clearly Defined Information Requirements

A key to implementing a useful and effective EIS is determining the information requirements of system users (Rainer and Watson, 1995; Watson and Frolick, 1993). This is often the most challenging task as some users are unsure of what they need or want from an EIS. Executives must be willing to participate in the process of determining system requirements through interviews and the use of prototypes.

Determining Information Requirements

Understanding the information needs of executives is one of the most difficult tasks in designing an EIS. Analysts cannot simply ask executives what information they need. Indirect questioning methods should be utilized to uncover information requirements. Three different approaches have been suggested and will be discussed next.

Wetherbe’s Approach

Wetherbe (1991) believes in using a two-step approach for determining executive information requirements. The first phase involves using structured interviews with executives and the second is developing a prototype to validate the system. Wetherbe outlines three possible methods for conducting structured interviews. He suggests that all three methods can be used together in order to obtain the most complete data requirements.

Business Systems Planning (IBM Corporation, 1984)

The idea behind this method is to determine problems and decisions that managers of business units are faced with. Therefore this method is best suited to identifying operational information requirements as opposed to strategic information requirements. Analysts attempt to get answers to the following questions (Wetherbe, 1991, p.58-59):
- What are the major problems encountered in accomplishing the purposes of the organizational unit you manage?
- What are good solutions to those problems?
- How can information play a role in any of those decisions?
- What are the major decisions associated with your management responsibilities?
- What improvements in information could result in better decisions?

Critical Success Factors (Rockart, 1979)

Critical success factors are factors that are essential for the success of an organization. For example, for a service company, customer satisfaction is critical to the survival and growth of the business. Identifying what is most important to executives can help to determine their information needs. This method is suitable for identifying both operational and strategic information requirements. The following questions can be asked (Wetherbe, 1991, p.59-60):

- What are the critical success factors of the organizational unit that you manage?
- What information is needed to ensure that critical success factors are under control?

Ends/Means Analysis (Wetherbe, 1988)

The focus of ends/means analysis is to determine desired end results and the means of getting there. For example, for a company to provide good customer service (end), it must provide customer satisfaction, reduce the number of complaints and promptly respond to inquiries (means). This method is more suitable for identifying operational information requirements. The types of questions that can be asked are outlined below (Wetherbe, 1991, p.61):

- What is the end or good or service provided by the business process?
- What makes these goods or services effective to recipients or customers?
- What information is needed to evaluate effectiveness?
What are the key means or processes used to generate or provided goods or services?

What constitutes efficiency in the providing of these goods or services?

What information is needed to evaluate that efficiency?

**Prototyping**

As previously mentioned prototyping is a key success factor for EIS implementation and is step two of Wetherbe’s (1991) approach for determining executive information requirements. Prototyping allows executives to discover additional information requirements through product usage. According to Wetherbe (1991), trial and error is a key step in system development.

**Volonino and Watson’s Strategic Business Objectives Approach (1991)**

The Strategic Business Objectives (SBO) method takes an organizational-wide approach to identifying information requirements. The idea is to look at organizational objectives and link them to the information needs of individuals within the company. This method attempts to fill the gaps left by other approaches by determining soft data needs and the timeframes within which data should be provided (Turban and Aronson, 1998). The steps organizations must follow under the SBO method are the following (Turban and Aronson, 1998, p.393):

1. Determine the organization’s SBO’s.
2. Identify related business processes.
3. Prioritize the SBOs and their related business processes.
4. Determine the information critical to each business processes.
5. Identify information linkages across the SBO business process.
6. Plan for the development, implementation, and evolution of the system.
Watson and Frolick’s Approach

Watson and Frolick (1993) interviewed organizations to uncover the methods most widely used for identifying EIS requirements at the onset of the system and throughout its lifecycle. The study resulted in sixteen methods which are condensed into the eleven methods provided in Table 2. Although several organizations reported using the method of developing an EIS in isolation, it is not discussed in the table below as it is not a recommended method. Having analysts design an EIS without speaking to executives can lead to severe dissatisfaction, as the system will not necessarily meet their needs.

According to Watson and Frolick (1993), there is no ideal or “best” method for uncovering executive information needs. Several methods should be utilized. For example, when analysts have limited access to executives, speaking with their support staff is key. Furthermore, different methods are needed to uncover both internal and external data needs. A key method that was missing from Watson and Frolick’s study is prototyping.
<table>
<thead>
<tr>
<th>Method</th>
<th>Details</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion with executives and support staff</td>
<td>Probing executives for information about their job functions, the information they currently use and the issues they are currently facing</td>
<td>Requires significant time commitments from executives</td>
</tr>
<tr>
<td></td>
<td>Meeting with support staff to uncover what information is important to executives and what information has recently been requested</td>
<td></td>
</tr>
<tr>
<td>Volunteered information</td>
<td>Executives make requests for information they would like to receive from the EIS (can be formal or informal)</td>
<td></td>
</tr>
<tr>
<td>Examination of existing computer reports</td>
<td>Looking through existing reports to determine what information needs to be included in the EIS, what information is missing and how the information should be presented</td>
<td>May offer limited value since EIS usually emerge from the need for information that is currently unavailable</td>
</tr>
<tr>
<td>Examining other EIS</td>
<td>Looking at other EIS can give executives an idea of what the system can do and what information can be included</td>
<td>Companies may be unwilling to share how they use their EIS</td>
</tr>
<tr>
<td>Participating in meetings</td>
<td>Strategic planning meetings: Understanding the long term goals of the organization can lead to discovering new information requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attending meetings such as project reviews and monthly sales meetings can help identify additional information needs</td>
<td></td>
</tr>
<tr>
<td>Determining critical success factors</td>
<td>Getting executives to determine what the company absolutely needs to do right in order to be successful and how to measure this success can lead to a better understanding of the factors that executives need to monitor</td>
<td></td>
</tr>
<tr>
<td>Using strategic business objectives</td>
<td>Understanding the business objectives helps to identify the information needed to monitor and support the attainment of objectives</td>
<td></td>
</tr>
<tr>
<td>EIS planning meetings</td>
<td>Getting EIS support staff, information system representatives, functional area personnel and the occasional executive to discuss development plans and prioritize changes to the EIS</td>
<td></td>
</tr>
<tr>
<td>Examination of non computer generated information</td>
<td>Looking at non-computer generated material, such as newspapers and articles that executives access on a regular basis, can lead to understanding the type of external data needed</td>
<td>This is typically soft information and EIS have been criticized for not including this crucial data (Salmeron, 2001).</td>
</tr>
<tr>
<td>Tracking executive activities</td>
<td>Shadowing an executive's activities can lead to a greater insight as to how executives use information</td>
<td>This may hinder executives in their daily activities</td>
</tr>
<tr>
<td>Tracking EIS usage</td>
<td>Tracking executive usage can help to determine which information is being utilized and which is not</td>
<td>This information can be used to make system modifications</td>
</tr>
</tbody>
</table>

Data Mining

In order to understand why data mining is pertinent to this project, one must first define the term. Turban and Aronson (1998, p.128) define data mining in the following way:

Data mining is a term used to describe knowledge discovery in databases, knowledge extraction, data archaeology, data exploration, data pattern processing, data dredging, information harvesting and software. All of these activities are conducted automatically and allow for quick discovery even by non-programmers.

In a more simple manner, Hormozi and Giles (2004) define data mining as the process of finding useful information from large amounts of data to obtain an advantage over competitors. According to Peacock (1998), data mining is simply a part of a whole process known as knowledge discovery in databases (KDD). The KDD process includes 10 phases: data funnelling, pre-processing, exploratory data analysis, recording and transformation, data mining-discovery, data mining confirmation, model validation, model scoring, reporting results and recalibrating the model.

Data mining emerged due to the rising amount of data collected by organizations. According to Kempster (1998), an average Fortune 500 company manages between 20 and 500 million pages of data and records daily. This number is expected to grow by 57 per cent annually. Data mining addresses the problem of far too little information being extracted from large amounts of data. Data mining could therefore allow Company XYZ to find valuable information and knowledge hidden within its POS data warehouse to help managers make better decisions.

Data Mining Tools

Data mining requires that a company has a data warehouse containing consistent, timely and accurate data. Three key barriers to data mining include poor data availability, poor data quality and data inconsistencies (Chopoorian et al, 2001). Data inconsistencies arise when
different databases capture the same information. IT must decide which data to use. Information must also be reconciled to ensure that standardized computing methods are used.

The second requirement of data mining is the use of appropriate analysis tools for uncovering information (Chopoorian et al., 2001). Table 3 summarizes data mining analysis tools that selected authors have identified. The most frequently used methods are described below.

**Table 3: Data Mining Analysis Tools**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clustering/segmentation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Visualisation</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Predictive modeling</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Link analysis</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Deviation detection</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Dependency modeling</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summarization</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Classification</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Forecasting</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Classification is the process of grouping data with similar characteristics into predefined classes. This tool can be used by organizations to segment the market in order to better understand various customer groups. Clustering or segmentation differs from classification in that the groupings are not pre-defined but rather are defined by the data itself. The data miner must decide whether or not the resulting clusters are meaningful (Hormozi and Giles, 2004).

Predictive modelling entails the prediction of outcomes based on certain variables. For example, one could use predictive modelling to determine who will default on a loan based on past credit history, current employment and debt to equity ratio. Yoon (1999) does not include predictive modelling as a data mining tool but includes regression, which he states can be used to predict behaviour.
Summarization, as the term implies, is a method used to condense large amounts of data into a more general and simple form. Peacock (1998) includes descriptive statistics such as counts, averages and totals as well as visualization in this category. Visualization is simply depicting the data in a graphical form in order to find hidden patterns.

A key tool utilized by retailers in analyzing POS data is link analysis. Link analysis is the discovery of relationships between different data records. For example, retailers may want to perform a market basket analysis, which is the analysis of items purchased together during a visit to the store.

**Key Uses of Data Mining in Marketing**

Data mining has a variety of applications, especially within marketing. Data mining can help organizations sift through large amounts of data to determine what customers to target. Furthermore, it can help firms understand who their customers are and what the best promotional activities are to target them (Hormozi and Giles, 2004). Peacock (1998) defines four key areas in marketing that can utilize data mining. These are customer acquisition, customer retention, customer abandonment and market basket analysis.

Data mining can help customer acquisition by using a two step process (Peacock, 1998). First, the organization must determine what current customers are most likely to respond positively to a new offer. Second, the attributes of these customers are then looked for in non customers. Similarly, Weir (1998) states that data mining can be used to profile and predict who has the potential to become a good customer. Better targeting of prospective customers can help organizations decrease costs in terms of the money and time spent on acquiring new customers.

Data mining can also help firms determine which customers are most likely to leave and adopt a competitive product. Firms can target these people to increase customer loyalty and as a result increase customer retention. Thirdly, data mining can help to identify which customers are
not generating money for the organization. Data mining can be used to identify these customers in order to try to cross sell them other products. Lastly, as previously mentioned, data mining can be used to perform market basket analysis of POS data.

Data mining in the retail industry can help firms determine product sales trends, customer buying habits and preferences, seasonal variations and customer peak traffic periods (Hormozi and Giles, 2004). Data mining can help to answer the following questions (Hormozi and Giles, 2004, p.69):

- How much are customers likely to spend over long periods of time?
- What is the frequency of customer purchasing behaviour?
- What are the best types of advertisements to reach certain segments?
- What advertising mediums are most effective in reaching customers?
- What is the optimal timing to send mailers?

Prior Research on Technology Adoption

Before investing in new technology, it is important for Company XYZ to understand the factors affecting technology adoption by individuals within its organization. Previous studies and models have looked at organizational characteristics, technology specific factors, and perceived outcomes to explain technology adoption behaviour. Technology and innovation adoption literature is valuable as it helps firms predict how users will react to a product and how to create conditions to increase product acceptance. It also enables organizations to understand why people resist change and what can be done to overcome this. The only way to obtain benefits from an EIS is by getting people to adopt it and experience satisfaction from it.

The study of technology adoption can be viewed from two different angles. The first angle focuses on how individuals adopt technology, while the second looks at organizations. This
section begins by looking at existing technology adoption models which focus on an individual’s adoption of technology. This report then looks at the factors influencing and hindering the adoption of technology by firms.

**Theories and Models**

The Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980) was developed to predict individual behaviour. This model postulates that attitudes towards behaviour and subjective norms affect the intent to perform certain behaviour. This behavioural intent in turn affects actual behaviour. Attitudes towards behaviour are affected by a person’s salient beliefs of consequences and his evaluation of those consequences. Subjective norms are determined based on the beliefs of influencers such as family, friends and peers.

The TRA was originally used in the field of social psychology. Researchers however began to use the TRA in a more broad sense to explain the factors affecting technology adoption. Wu (2003) for example uses the TRA to study why senior managers are reluctant to use information technology as a process reengineering tool. The TRA is further used in this study to uncover interventions that help change management behaviour. According to the TRA, external factors that have been previously studied, such as user involvement in system implementation (Baroudi, Olson and Ives, 1986) and the use of technology champions (Beath, 1991), influence behaviour indirectly by affecting attitudes and subjective norms.

Since the TRA was not specifically designed to explain technology adoption, Davis (1989) adapted the theory to create the Technology Acceptance Model (TAM). The TAM proposes that a system’s perceived usefulness and perceived ease of use are external factors that determine a person’s attitude towards technology. This attitude then determines behavioural intent and the actual use of the system.
Davis (1989, p.320) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". He defines perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p.320). The TAM posits that these two factors can be used to directly influence user attitudes towards technology, and that perceived usefulness actually affects behavioural intent directly. System usefulness has been shown to be valued higher than system ease of use (Davis, Bagozzi and Warshaw, 1989). Igbaria and Iivari (1995) confirmed this finding with users in Finland and found that they valued usefulness more than American users. Therefore users are willing to tolerate a system that is difficult to use as long as it performs well. This research emphasizes the importance of a thorough user needs assessment in the product development lifecycle. Controllable external variables such as friendly user interfaces, interactive user training as well as superior product support can all be used to increase the perceived ease of use of the system (Davis, Bagozzi and Warshaw, 1989).

A number of papers have also studied extensions to the TAM. Igbaria et al. (1997) for example extends the model to include extrogenous variables such as management and external support, which influence both perceived ease of use and perceived usefulness. Venkatesh (1999) uses the TAM to demonstrate that interactive training will affect perceived ease of use and lead to increased behavioural intent. He also finds that early perceptions and acceptance by users is critical as perceptions are formed immediately and are difficult to change. Venkatesh et al. (2003) further expands the TAM by postulating that behavioural intent is also affected by intrinsic motivation. Intrinsic motivation, such as perceived enjoyment, refers to activities performed "for no apparent reinforcement other than the process of performing the activity per se" (Teo et al., 1999, p.26).

The Diffusion of Innovations theory (DOI) by Rogers (1995) summarizes what has been studied with respect to the spread of ideas. Rogers identifies five characteristics of innovations
that affect the rate of adoption by individuals: relative advantage, compatibility, complexity, divisibility and communicability. Although Rogers' model is widely used, many researchers have questioned its applicability to technology adoption from an organizational perspective (Chau and Tam, 1997). Fichman's (1992) review of technology adoption studies found that using innovation characteristics alone is insufficient for predicting a firm's technology adoption.

**Technology Adoption Influencers**

Several researchers have studied the various factors affecting the adoption of technology by organizations (Table 4). Technology adoption influencers can be grouped into three broad categories: organizational characteristics, technology specific factors and perceived outcome motivations.

**Organizational Characteristics**

Organizational characteristics that have been studied include the firm's size (Kowtha and Choon, 2001; Dewar and Dutton, 1986; Sciulli, 1998; Ettlie, Bridges and O'Keefe, 1984). The argument made by these studies is that a larger organization will have more human and capital resources to invest in technology adoption. Therefore, larger organizations will adopt technology more readily than smaller firms.

A second characteristic is organizational support. Beath (1991) and Ettlie, Bridges and O'Keefe (1984) found that the presence of a technology champion helps bring about organizational change. Furthermore, Ettlie, Bridges and O'Keefe (1984) found that an aggressive technology policy and the availability of technical specialists lead to an increased probability of technology adoption. Igbaria et al. (1997) found that management support, internal training and support, and external training and support, lead to increased technology adoption.
Table 4: Technology Adoption Influencers

<table>
<thead>
<tr>
<th>Technology Adoption Influencers</th>
<th>Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Firm’s size, age, competitive intensity, existing competencies, strategic commitment and website age</td>
<td>Kowtha and Choon (2001)</td>
</tr>
<tr>
<td>Availability of technical expertise in the form of technical specialists</td>
<td>Dewar and Dutton (1986)</td>
</tr>
<tr>
<td>Use of a technology champion to bring about change in the organization and break down bureaucratic barriers</td>
<td>Beath (1991)</td>
</tr>
<tr>
<td>Aggressive technology policy</td>
<td></td>
</tr>
<tr>
<td>Availability of technical specialists and champions</td>
<td></td>
</tr>
<tr>
<td>Organization size and structure</td>
<td></td>
</tr>
<tr>
<td><strong>Public versus private sector organizations</strong></td>
<td></td>
</tr>
<tr>
<td><em>Organizational environment</em> (interdependence, red tape/accountability)</td>
<td>Bretschneider (1990)</td>
</tr>
<tr>
<td><em>Managerial actions</em> (evaluation of IT, planning, placement of top manager)</td>
<td></td>
</tr>
<tr>
<td><strong>Organizational structure</strong></td>
<td></td>
</tr>
<tr>
<td>Centralization, formalization, complexity, size, integration</td>
<td>Sciulli (1998)</td>
</tr>
<tr>
<td><strong>Management and external support</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Technology/implementation specific factors</strong></td>
<td></td>
</tr>
<tr>
<td>Characteristics of innovation</td>
<td></td>
</tr>
<tr>
<td>Relative advantage, compatibility, complexity, divisibility, communicability</td>
<td>Rogers (1995)</td>
</tr>
<tr>
<td><strong>Proven technology / network effects</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived outcome motivations</strong></td>
<td></td>
</tr>
<tr>
<td>Rational outcomes versus risk</td>
<td></td>
</tr>
<tr>
<td>Improved communication</td>
<td></td>
</tr>
<tr>
<td>Easier access to company information</td>
<td></td>
</tr>
<tr>
<td>Reduced paperwork</td>
<td></td>
</tr>
<tr>
<td>Enhanced task coordination</td>
<td></td>
</tr>
<tr>
<td>Enhanced employee productive</td>
<td></td>
</tr>
</tbody>
</table>

Lastly, the structure of the organization has also been researched. Bretschneider (1990) studies how IS decisions are made differently in private and public organizations. He finds that public organizations have a greater interdependence across organizational boundaries and as such, managers need to contend with more red tape and coordinate with other functions. Furthermore,
the study finds that public and private organizations evaluate software and hardware decisions differently. To deal with the frequent change of top managers in the public sector, decision makers are found at a lower level than in the private sector. Sciulli (1998) found that lower levels of centralization lead to an increase in user involvement in the process and therefore increased adoption.

**Technology and Implementation Specific Characteristics**

Rogers' (1995) five innovation characteristics will be outlined next. Relative advantage is defined by Rogers as being the perceived advantages of an innovation over its predecessors. The more an innovation is perceived to be advantageous, the greater the likelihood of adoption. The next factor, compatibility, looks at the degree to which a person's values and past experiences are congruent with the innovation. Rogers posits that a positive association exists between compatibility and technology adoption. The third characteristic of complexity refers to the perceived ease of use and understandability of the innovation. High complexity is negatively associated with adoption. A fourth characteristic of innovation is divisibility. This refers to the ability to try an innovation on a limited basis before deciding to purchase it. Rogers' study shows that divisibility is more important to early adopters than to laggards since the technology has yet to be proven. Lastly, communicability is the degree to which the innovation's benefits can be observed by others. Increased communicability has been found to increase innovation adoption.

The Herd effect occurs when network externalities exist. Choi's (1997) research suggests that people are more prone to choosing a proven technology even though a new technology may be better. The herd effect occurs due to the fact that users want to avoid risk and do not want to be left stranded with a technology that is not adopted by others. Having a larger customer base using the same product adds confidence that vendors will provide continued development and support of the technology product.
Perceived Outcome Motivation

Teo and Tan (1998) surveyed organizations with and without Internet accounts to discover the motivations for adopting the Internet. Organizations viewed improved communication, easier access to company information, reduced paperwork, enhanced task coordination and enhanced employee productive as the main benefits of Internet adoption. Au and Kaufman use the Rational Expectation Hypothesis (REH) (Muth, 1961) to show that people use available information to make a decision. According to this model, expectations are formed based on informed predictions of future events. Therefore, people gather lots of information, learn from the information, and then adjust their expectation based on knowledge. This theory also states that people share information to get others to adopt the technology in order to benefit from network effects. Adoption of technology does not happen until the decision maker feels comfortable with the technology and understands its benefits.

Best Practices

One method for developing and building an information system is by looking at the practices of companies in the retail industry. Below is a snapshot of POS systems at work in two major international restaurant chains.

Profile: Red Robin International

Description: Burger casual dining chain

Number of restaurants: 135

Red Robin has a data warehouse, using SQL Server 7.1 with Star Schema Data Mart. Point of Sales data is inputted daily using XcelleNet Polling sessions. Back office data is supplied by MenuLink. The data then goes into a Microsoft Access database where Impromptu is used to create tables. This data is separated into four cubes. Sales mix, financial data and restaurant level invoices. A fourth cube is dedicated to Sysco, their supplier.
Menu placement: The company uses the system to improve menus, track costs and get fresh comparison information. They have the ability to track everything including menu mix and purchasing activities. Due to a relational database, executives have the ability to do “what-if” analysis. For example executives are able to query “if we put the items with the high margin in middle of menu, do we sell more than if it were at the top”. They then track the data for 4 weeks, checking it weekly. The system also shows the cannibalization effect on menu items.

Costing & Purchasing: The system has a built in purchasing cube that tracks invoices by restaurant, region or state, by item or menu category and by time periods such as year, week or day. By entering the food preparation standards for every recipe item in the POS system, Red Robin is able to calculate theoretical food costs as well as labour content.

Report Generation: The relational database allows executives to create their own report through a drag and drop interface, and they have therefore eliminated the need for ad hoc reporting (Ruggless, 1999).

Profile: Interfoods of America

Description: Operators of Popeye’s, quick service restaurant

Number of restaurants: 166

Interfoods is on a drive to better leverage POS data on a unit based and corporate level. In partnership with Mirus Restaurant Solutions the company is using business intelligence for better decision making. The company chose to outsource its data management facilities due to the dynamism in technology, and did not wish to bear the cost of upgrading in house systems which usually done on average every 4 to 5 years. Mirus polls the POS data remotely, consolidates it, warehouses it and then generates customised management reports that are accessible through the web. Access varies depending on the decision maker’s seniority in the organization. The
information is presented by individual unit performance as well as multiunit performance by region and across the company. The system also touches on sales, labour and average transactions for example.

- **Performance tracking:** Executives are able to track performance using a “dashboard”, which is a configurable web page showing summaries of up to 9 areas that are of interest to them. The dashboard has ‘idiot light” icons, so that executives are able to see instantaneously the performance of the restaurants and regions. The colour coded system uses green to indicate all is good, yellow to suggest caution and red to indicate that there is a problem and action needs to be taken.

- **Costs and Financial reporting:** The company has entered all its recipes into the POS system and therefore is able to track theoretical food cost through the breakdown of what is sold on a daily basis. The staff also inputs inventory levels on a weekly basis. As a result each Monday a troubleshooting report is generated displaying actual costs against theoretical costs. From the data repository Popeye’s is able to move data easily into its accounting software.

- **Labour management:** Employees clock in their hours through the POS system, from which weekly payroll is generated. The system allows editing by the store or regional manager through a Mirus webpage.

- **Promotion tracking:** The company has the ability to track the performance of advertising campaigns, direct mailings, and product launches, as early as a day after the promotion is initiated. The reports provide detailed information such as how many coupons were redeemed and how many coupons were up-sold (Liddle, 2002).
3. RESEARCH METHODOLOGY

The purpose of this project was to uncover information requirements of executives and managers at Company XYZ. The research is exploratory with the aim to discover ideas, insight, attitudes and opinions about executive’s information requirements and needs. The results of this research will help to establish reporting priorities for Company XYZ and identify areas needing more research. This paper aims to discover high level information requirements and does not provide specific report designs. Further research is needed in order to drill-down to this level of detail.

Sampling

A sample of 17 executives and managers was dictated by the project sponsor at Company XYZ. Please refer to Appendix A for the list of interviewees. The interviewees represented all key areas within the organization including Marketing, Purchasing, Accounting, Food Services, Corporate Services, Menu Development and Business Management Units. The CEO, CFO and President were also interviewed. All of these interviews were conducted at the head office. In order to gain a global picture of what information Company XYZ needs, executives from the US operations were also included in the sample. This interview was conducted via video conference.

The goal of this research is to understand the information needs of executives throughout the organization. Executives from the Marketing department were included in the sample as they are prime users of sales data. These executives need data to evaluate marketing initiatives and manage the Company XYZ brand. The Purchasing department was interviewed as its information requirements are distinct from that of other departments. Purchasing managers use sales data to determine the amount of product to order and send to distributors. Furthermore they use this information to negotiate more favourable contracts with suppliers and to assure that food costs
and sales mix are on target. The Accounting team is responsible for generating key sales reports for the organization. As such, their input was needed to understand the report generation process and factors causing delays in reporting. The Corporate Chef was included in the sample since he is responsible for recipe development at Company XYZ and has unique needs. He not only requires sales information and food costs, but also needs information on new menu items currently being tested. The VP of Food Services and the EVP of Corporate Services together oversee the purchasing, menu development and training functions. Although two of these departments were already part of the sample, these executives were added to understand the needs of employees at various levels within the organization. It is postulated that these two executives require more summarized and aggregate data. The EVP of Corporate Services also oversees the marketing and IT functions. His input was therefore crucial in understand the strategies and goals of IT. The VP of IT was also interviewed in order to understand existing tools available and the IT strategy used for providing information to users. The EVP of the Western region was included in the sample to represent the needs of business management units. Company XYZ’s restaurants can be divided into 3 business management units according to their geographic location. The Western region EVP was select as this region contains the most number of stores and this executive is located at the head office. Lastly, in order to understand the information needed to steer the organization and devise its strategy, the CEO, CFO and President were included in the sample.

Procedure

As outlined in Table 2 of the literature review, there are 11 methods that may be used to determine information requirements. It is suggested that more than one method be utilized to get a good understanding of information needs. The first method involves discussions with executives to determine their job functions, the information they use and the information they are lacking. This method also requires meeting with support staff to uncover what information is important to
executives and what has been requested in the past. This was the main method utilized in this study. In-person, semi-structured qualitative interviews were conducted with the sample. These lasted between 30 minutes to an hour. The questions created as a guide for the interview process are provided in Appendix B. Open-ended questions were mostly used as these provide deeper and richer information. They also allow researchers to probe for a better understand of requirements. The purpose of the interviews was not disguised and participants were told the exact nature of the project.

The interviews were conducted by the two researchers and were taped and transcribed for analysis. Some interviews were conducted in groups of two while others were done on a one-to-one basis. The group interviews were used to question managers within the same department. Individual interviews were mostly used for company executives.

The interview questions were designed using frameworks from the literature review and were used to understand the following:

- The role of the individual within the organization (Business Systems Planning - IBM Corporation, 1984) by asking questions such as:

  ➢ Please describe the major decisions associated with you job responsibility.

  ➢ Describe some challenges that you were faced with in trying to meet your organizational or departmental goals.

- The factors critical to the success of the organization or department (Critical success factors - Rockat, 1979) by asking questions such as:

  ➢ What do you absolutely need to do right in order for your organization/department to be successful?

The interview with IT was quite different and did not use the same line of questioning. IT was asked to demonstrate existing tools and tools currently in development. Furthermore, specific
questions relating to information gaps were posed to ascertain whether or not desired information could be made available to users. The purpose of this interview was mainly to have a better understanding of the POS system and the current tools used to extract information from it.

The second method identified in Table 2 was getting executives to make requests for information they would like to receive. This was covered during the in-person interviews as executives were asked to email the researchers should they think of additional information requirements.

The third method identified was the examination of existing reports. During the interviews, executives were presented with four existing reports: the Rate of Sales Report, the Marketing Promotion Report, the New Stores Report and the Monthly Sales Report. This method was used to understand needed and missing information. Questions such as the following were used:

- Tell us about the current reports you have access to.

  ➢ How do you receive these reports?

  ➢ How do you use these reports? What types of decision do you make based on these reports?

  ➢ How useful or not useful are they for making decisions? What do you like and dislike?

Finally, a key method to understanding what is important to executives is asking them to identify their critical success factors. This method was utilized during the interviews. Understanding how to measure these success factors can help to identify the information that executives need to monitor.
Data Analysis

The analysis focused on three things. The first was to determine the information needs of each person interviewed. The second was to determine what information users wanted to get out of the system that was currently unavailable. This is referred to as a reporting wish list. Improvements for individual reports are also included in this section. Lastly, the information requirements were summarized by finding similarities in the requirements of the various interviewees. Like themes were identified and key concerns were enumerated. The analysis of the interviews was done separately by the two interviewers in order to ensure the best possible interpretation. The two results were then consolidated into the final analysis.

Once the interviews were transcribed, the first step taken was to identify quotes that expressed an information need. Each quote was given a title to describe the need. Next, quotes were identified for specific requirements on existing reports. Again, each of these quotes was given a title to describe the information deficiency. Once all of the interviews were analyzed in this manner, a table was constructed to identify common information needs. A common need was defined as a need identified by 2 or more departments/executives. This analysis resulted in Table 5. Each need was then analyzed to see whether or not it was currently being addressed by IT. If it was not, a recommended action was cited.
4. RESULTS

This section outlines the information needs of the various executives interviewed. Firstly, it describes the role of each department or executive and the information that is necessary for them to operate successfully. Secondly, it looks at the way in which they use the current reports along with their suggestions as to how these may be enhanced to better meet their information objectives. The section ends with excerpts from the interview conducted with Information Technology team. This interview outlines capabilities of the POS system as well as projects currently being rolled out.

The Chief Executive Officer

An interview was done with the Chief Executive Officer in which he talked about his information needs, the information that he is not currently receiving and the information he is able to glean from current reports.

Role of the Chief Executive Officer

- To spearhead the strategic planning of the company
- To ensure the overall smooth operations of the company
- To manage the success of the brand, by ensuring the profitability of all its franchisees.

Information Needs

Most of the information that the CEO requests is to aid him in charting a strategic direction for the brand. To him, success of the brand comes on the platform of success in the company’s core business by way of profitable franchisees. To this end the CEO requires
information relating to sales in the stores, promotion performance and the performance of new stores and newly renovated stores in relation to the entire chain.

This brand is only successful in our platform if the core is successful. So what I try to do is I try to get information that tells me or gives me an idea of how successful the brand is. ... And ultimately the success of the brand is the success of the individual franchisees. If the individual franchisees are successful, the brand is successful, the franchisor is successful.

He is able to get a lot of information relating to stores that are scheduled to open in the future, but is unable to readily obtain timely information on the core stores currently in operation.

I can probably get more information about the new development than I can about my cores ones that are open. And what I mean by that I know pretty much how many we have to open in each one of the provinces and when they’re going to open and with whom. I don’t have any information that tells me how successful my core is doing on a weekly or even monthly basis without having to wait an extended period, amount of time. So, it’s rather interesting that you have an existing customer here [core] and a brand new customer here [new development] but you know more information about your brand new customer than about your existing customer.

**Reporting Wish List**

In managing the success of the brand there are two areas in which the franchisor (Company XYZ) can directly influence the success of its customers (the franchisees) namely sales and cost control.

1. *Timely and Accurate Cost Information to Evaluate Cost Control*

   Cost control is limited to certain costs such as food cost, as the franchisor is unable to manage the in house costs such as labour, electricity and rent for each franchise store. In support of this goal, the franchisor operates on a standard Y% food cost model. In short the CEO would like to measure the effectiveness of the cost controls implemented by his company.
2. *Timely Accurate Sales and Promotion Information to Evaluate Marketing Efforts*

On the flip side of managing costs is driving sales. Company XYZ is pushing sales by marketing the brand. The CEO is therefore interested in ascertaining the effectiveness of marketing efforts through initiatives such as promotions and advertising activities.

There are only two items that we can control to measure the success of franchisees. Number 1 is sales, number 2 is cost controls, not on cost control in the whole restaurant. ... So when I drum down what I want to know is how good of a job are we doing to influence the franchisees' success? ... How effective are sales and how effective are the cost controls that we can control?

3. *More Customer Information*

Although the CEO is fully cognisant that it is not feasible to get detailed information on each of his X million diners, the CEO wishes to have more information regarding their attitudes and behaviours. He would like answers to questions such as: Why patrons choose Company XYZ, why do they buy the things they do, what time are they buying them and in what combinations are they buying them?

4. *Use-Powered Reports and What-if Scenarios*

The CEO would like to access reports from his desk which allows him to investigate and get more information if he needs it. A framework such as a decision matrix cube to facilitate "what-if" scenarios was also something that he mentioned would be helpful in satisfying his decision needs.

*Rate of Sales Report*

The Rate of Sales Report helps to assess the success of food cost controls. The report displays an overall food cost as well as sales by category.
Area for improvement:

- While the CEO concedes that this report gives him valuable information, he laments its lack of timeliness and its tendency to sometimes be unreliable.

  This is a very valuable report, but it takes a while for it to come out. So you get it, theoretically you probably get it 20 to 60 days after the fact. So it's not timely. … this is a very very valuable report in assessing the overall success of the brand.

**Marketing Promotion Report**

This report is somewhat useful in determining the success of the core business as it measures the success of the promotional activities that are aimed at driving sales.

Areas for improvement:

- Promotions sometimes have short life spans, so it is imperative that performance measures be available quickly in order to gauge whether adjustments may be needed. The CEO felt that this information was not produced in time to enable adjustments if necessary.

- Regional analysis would allow him to know how well the promotion is doing in one area versus another.

  All I'm trying to do is assess the existing customer base. And to get this information a month or two after the fact means that you can't meaningfully make changes if you have to make changes. Nor can you meaningfully find the positives to help others if its old data. What would we do, if we could have the information weekly? Well we could quickly assess, do we need to tweak a promotion, do we need to do something next month, do we need to help this guy, do we need to do that? More information on our existing base.

**New Store Report**

From this report, the CEO is able to ascertain how newly renovated stores are doing. This report also gives him a progress report on stores that have recently opened. Additionally he is able to see the how many guests are served on a weekly basis as well as their average spending.
Areas for improvement:

- The CEO would like to have a longer reporting time. The report now covers a span of only 16 weeks.

*Monthly Sales Report*

The CEO finds the Monthly Sales Report useful because it tells him how well a store is doing in comparison to itself (on the basis of time), its region and the rest of the stores in the chain. In other words it measures the success of the franchises and consequently gives an indication of the success of the brand.

Areas for improvement:

- Information provided is on the gross sales of the stores, which include liquor sales. As Company XYZ is only able to collect royalties on franchise sales i.e. gross sales less liquor sales, it would be useful to see the total franchise sales across stores, not just gross sales.

- Year over year customer count would also be helpful in the report.

- The report should allow for further breakdown into time segments such as day parts and week parts on a regional basis. This would allow the company to have an idea of how particular meal times perform in each region.

*Overall Rating*

Based on the tardiness of the reports and therefore his inability to use them to make proactive decisions, the CEO rated his access to information as a 5. He did indicate that the information he gets is effective in his goal of assessing the success of the brand, he is just unable to do so in a timely manner.
The Chief Financial Officer

This segment highlights the points that were captured in an interview with the Chief Financial Officer at Company XYZ.

Role of Chief Financial Officer

- To administer the royalties fund, all accounting, insurance and tax planning
- To oversee the administration, investor relations, and legal departments
- To generate accurate, timely and complete information in the prescribed form to aid in decision making
- To produce accurate financial statements that fulfil the guidelines of the securities exchange and for the public

Information Needs

Unlike the other departments in the company, the Accounting division is more a generator than a user of reports. The CFO does not use reports heavily; he usually reviews them for information purposes.

1. Accurate Data to Produce Reports for Decision Making

The Accounting department is responsible for the production of the Monthly Sales Report. The department therefore needs accurate data from the POS systems in the stores. The CFO stated that although the report does not have all the stores in the chain, it is statistically sufficient to get a very good sense of the performance of same store growth.

Sometimes a couple of them will be missing, because of a connection problem but I mean you get virtually all of it. By the same token, the core sales report, some of the sales reports we get, are on a sampling basis. So if we have X stores today in Canada, today I will get core growth for last month but I know that that report will be based on a sample of stores. That’s fine because if you guys have
studied statistics, you know that that is a statistically valid part of the population. So, you don’t have to have every single store for it to be a good report.

*Rate of Sales Report*

The CFO has the responsibility of promoting the Income Fund. The ROS report shows him whether the food cost margin and the sales mix are healthy. He tells how the report is useful in these instances:

I would just want to see that our food cost margins are maintained, what is happening with our sales mix. The reason I like this is that a lot of my time is spent in Toronto promoting and that sort of thing. And these are the kinds of questions people ask. What is your most popular sandwich, and pizza and stuff like that? That is where the use of it is.

*Marketing Promotion Report*

The CFO looks at the report to get a general idea of the direction of sales and how they have been moving during a 2 year period. He wants to know whether the promotion is still effective in driving sales.

*New Store Report*

He sees this as a complement to the Monthly Sales Report that gives an overview of how the corporate owned stores, new stores and newly renovated stores are performing. Again this is reviewed for information purposes only.

*Monthly Sales Report*

The CFO finds this report very useful in tracking core store sales. If core sales are not growing on a yearly basis, this indicates that there is a problem in the business.

What I find a lot more useful is now we are starting to track our core sales. Because any retail business that is probably the most important measure is your core sales. Even more important than how many stores you are opening. You are going to say our core stores, how they are doing. Year over year, if your core
store sales are not growing, it doesn’t matter how many store you are opening, you have a problem with your business. ... That’s really great information.

Overall Rating

The CFO rated his access to information as an 8, the gap he said was due to the slow adoption of the technology within the company. He suggests that improvements in the management of adoption and timelines for executing projects would prompt him to revise his score.

Company XYZ in the United States

Below is information put together from an interview with the Chief Operating Officer and the Chief Financial Officer of the U.S. operations.

Role of Company XYZ U.S

- To manage the operations of Company XYZ in the U.S including marketing, operations, finance and accounting
- To sell franchises and increase the presence of Company XYZ in the U.S
- To provide support for franchises through an advisory council
- To liaise with the Canadian operations

Information Needs

The U.S operation of Company XYZ is currently on a drive to sell Z number of franchises in order to recoup their U.S investment. In less than 2 years they have achieved 1/3 of their target. Their information needs are therefore twofold. Firstly, they need information to guide the expansion by identifying for example new markets and viable areas. This information is however not extracted from the POS system. Secondly, they need information to assess the
performance of the stores that are currently in operation. This information would enable them to provide support to their franchisees by supplying broad analysis across the country and across segments.

In many ways they require very detailed information, which they indicate is actually collected and stored in the POS system. They however lament the fact that there is not an adequate data mining facility to produce the reports that they need.

1. Detailed Sales Figures

In a nutshell, the U.S team would like sales information in different formats. Top line sales are inadequate for their needs.

My store down the street did 2.7 million in value, that’s truly the tip of the iceberg. Ok how did it do compared to last year, how is it doing against other stores? How is it selling its product? What are the day parts we’re selling and, is my lunch stronger, is my dinner stronger? How is this year day parts compared to last years? (COO U.S)

They want to know specific details such as:

- Daily sales information broken down by channels
- Detailed cost and labour information on a daily basis
- Information on how well stores are selling products
- Information on the effectiveness of promotional activities such as feature sheets
- Information on the differences between sales of stores in one area versus another
- Sales of menu items individually and by category
- Guest count comparisons
- Average cheque information
- Trailing 12 month sales information
- Trending information for the last 3 months
- Top 10 selling items

2. Aggregated Data

Presently, Company XYZ U.S is unable to easily find out how well their stores are selling. As a stop measure, their corporate stores call in on a daily basis to report their sales. In order to have a picture of total monthly sales, information is pulled from the POS system and manually tracked and aggregated in an Excel spreadsheet. They would like this process automated.

3. Drill-down Capabilities

The U.S team wishes to have a multi relational database with a data mining tool attached that would allow them to drill-down on readily available pre-formatted reports.

Existing Reports

The U.S team does not currently use the standard reports in Canada. Their needs are much more specific and detailed than those requested by their Canadian counterpart. Many of their requests are being worked on by the IT department and should be released shortly.

Company President

This interview was conducted with the President of Company XYZ.

Role of the President

- To manage the day to day operation of Company XYZ in Canada. This includes overseeing marketing, operations, development, sales, IT as well as franchisee and customer relations
• To manage the company’s strategy, making sure that the organization is pointed in the right direction and doing the right things strategically to ensure success

Information Needs

In order to steer the organization in the desired direction, the President utilizes several types of information. The President needs internal sales data from the POS system to see how the organization is performing and how it is trending. The President also utilizes several sources of external data. Market information is needed to know how the economy is doing on a whole and how the industry is performing. Data from research firms is also used to track customers’ usage and attitudes towards Company XYZ. He also used data from commissioned initiatives such as mystery shops and quality assurance tests. In summary, the President uses the information to study trends and key performance indicators.

Reporting Wish List

The President outlined two key information requirements: obtaining information in a more timely manner and summarizing data in a more meaningful way. The President does not want to manipulate data. The information should be readily available and organized in a summarized fashion. The use of graphs and pie charts is also helpful.

It’s making sure you have the right internal systems to capture the data, and summarize it. That’s the other thing too. We are not there yet in summarizing the data so that it is meaningful when we look at it. In other words, we have X restaurants, I don’t need to see data on X restaurants, I need it summarized. … Taking the raw data and putting it in a format that is usable, that makes sense. … I mean raw data if it isn’t summarized properly really is of no value.
Rate of Sales Report

This report is mainly used to see what is selling and what is not. The President uses it as a snapshot of the overall mix of what is sold in the stores and how profitable it is. This report is especially useful when new products are launched.

Marketing Promotion Report

This report is not looked at in great detail. It is used to see how successful a promotion was compared the previous year.

New Stores Report

The President uses this report to look for trends. It is also used to identify and monitor stores which are performing below par.

We have all kinds of operations reports on stores. I am looking for trends. Looking to see that things are moving in the right direction, but not necessarily looking for one bad thing. I am looking to make sure that things are trending in the right way. So I am not interested in heavy duty detail. I just want to make sure that our scores our trending up, our sales are trending up etc.

Monthly Sales Report

This report is used as an accounting and trending report. It is a tool that ensures that franchisees are reporting monthly in order to facilitate the calculation and payment of royalties. It is also used to compare sales of the current year with previous months and years as well as to track same store sales growth.

Area for improvement:

- The data is outdated by the time this report is received. The newly created Weekly Sales Report has helped to remedy this problem.
Overall Rating

When asked to rate his access to the appropriate information for making decisions on a scale of 1 to 10, with 10 being the highest, the President answered 8. His main issues were the tardiness of the data and the inability to summarize it in a meaningful way.

Corporate Services

Corporate Services oversees any activity that is done on a national level including Information Technology, Food Services and Marketing. The VP of Food Services is responsible for the Corporate Chef /Menu Development, Purchasing as well as Training and Development. He reports to the EVP of Corporate Services whose portfolio also includes IT, Marketing and the company architects. The information below is extracted from interviews with both men. A separate interview was held with the Senior Buyer and the Director of Purchasing. As a result the responsibilities and information needs of Purchasing are covered separately on page 65. Marketing information may be found on page 73, which was gathered from a meeting with the Director and VP of Marketing. Details of the Corporate Chef interview may be found on page 71.

Role of Corporate Services

Training and Development

- To ensure that accurate training materials are available to facilitate the instruction of franchisees and their restaurant staff
- To develop recipe preparation guides for menu items
- To create study guides for use within restaurants
- To maintain current nutritional and allergen charts
Information Technology

- To deliver timely, accurate information to the end user

Information needs

The information needs of Corporate Services differ according to the functions under its umbrella. For Purchasing, information pertaining to the velocity and volume of sales is necessary to negotiate favourable contracts with suppliers. The Purchasing team also wishes to have information to easily track all their suppliers and their related contracts. Secondly, information regarding the performance of individual menu items is needed to develop and adjust the core menu that is used in every store. Thirdly, for Training and Development, the Corporate Services team needs information that would determine the impact of training and how training is deployed throughout the franchise network. Lastly, Corporate Services through its Marketing portfolio has the responsibility of managing the success of the Company XYZ brand. To this end, the division requires information relating to the needs and behaviours of their customers and the performance of marketing activities.

Reporting Wish List

The Corporate Services team needs information that is timely, accurate and user-friendly.

1. Fact-Based Decision Making Through Timely, Accurate and Accessible Data

The EVP of Corporate Services needs to have information available in a timely manner so that decisions can be made based on facts. Outdated information impedes this goal. Corporate Services does not need to look at the sales of all stores on a daily basis as weekly sales information is sufficient. However, Corporate Services would like to access daily store sales for corporately owned stores and new stores. Corporate stores are wholly managed by Company XYZ and therefore must be closely monitored. It is also important for new stores to be monitored
during the first year of operation to ensure that stores are growing as expected and operations are running smoothly. The EVP of Corporate Services believes that the information needed is in the system, but it is not readily accessible in a timely and simple manner.

We always want to be able to make decisions based on fact, as opposed to gut feel or subjectivity, someone's opinion. ... When we go to make a decision that is impacting a whole lot of people's businesses, we need to be able to look at their business, understand it from a numbers point of view and then make our decision based on what we see there. And then go back and measure and see if we got results. (EVP Corporate Services).

2. Structured Procedure for Designing Reports

The EVP of Corporate Services believes that report creation should follow a two step process. The first step entails everyone agreeing on the reports needed, the level of detail and the format. The second step involves looking at the bigger picture when requests for new reports come in. In this step similar requests are consolidated in order to produce one report rather than many. When requests come in, it is very important for users to be clear regarding their needs. A formal process of clearly defining what the requirements are for the report is crucial.

So how can I structure this report so that it is useful for everybody. ... I always see that it is easy to add one more level in there such that it tells a story for everybody (EVP Corporate Services).

3. Linked Databases of Recipes, Nutritional and Allergen Charts

The VP would like Training and Development to have a tool which allows change in recipes to trigger adjustments to the related allergen and nutritional databases. Currently all changes are done manually, for example the allergen chart is maintained as a Microsoft Word document. To illustrate how a simple change in ingredients may elicit a domino effect, the VP gave a hypothetical example.

Training and Development also they'll create, lets see what's an example, an allergy awareness chart, and then we'll have a nutritional analysis chart which is information we have to have on every menu item. ... Suddenly in the middle of the year we switch soy sauce supplier, and the new soy sauce has MSG and the
old one didn’t and it’s got a different sodium content. ... Suddenly we have to redo all the allergy charts in the entire chain of X restaurants, because this item, this item, this item and this item uses the new soy sauce that has MSG. It’s the same deal with the nutritional information. ... Oh but hang on, we post that on the internet for the public to see, so someone has to go to our Internet site and change the nutritional information. ... It all happens but it’s just through force of will and tons of follow-up as opposed to making it easier. ... My perfect world we have the master database made up which is all linked, hyperlinked to the various different categories (VP Food Services).

Such a change also prompts modifications in menu development.

And then its just could be that the old soy sauce came in the 250 ml bottle the next one come in a 591 ml bottle, so we have to go to the training department and go ok its no longer 1 full bottle per recipe batch, its now 1/3 of a bottle or whatever. It flows on, just changing a product can be a huge nightmare. Right now if there are 8 recipes that use soy sauce, I’d have to manually go in and change this one, I’d have to manually go in and change this one, then I have to remember to do the nutritional information. We have to assign that to somebody to do and they’ll go get it done, right back to the chef. So there is a higher sodium content chef, it may affect the flavour. Is that still the recipe we want to have or do we have to adjust the amount in the recipe not just the pack size that it came in? (VP Food Services).

4. User Powered Reports

In his capacity, the VP needs more than top line sales. He wishes to have access to more details such as sales broken down by item, time, cost centres and quantity.

I need to know how many orders of hot wings did we sell at lunch, at dinner for each day. I need all of the sales information. ...you’ve got your lunch day parts, your dinner part and then late night and there are subcategories here depending on the season and the location of patio and there’s also lounges, which are way separate entities but each of these can happen during these day parts. Now as far as I know our database isn’t laid out that way at all. But that’s the information I need. There’s nothing automated that gives me these print outs (VP Food Services).

5. What-if Scenarios

The VP would like to be able to create what-if reports where he is able to set parameters while manipulating variables to see the effect on other variables. For example by holding everything else constant and changing the selling price or ingredient he would be able to see the
effect on theoretical food costs. This is a service that he believes would be very helpful to the franchisees.

6. Representative Sample of Stores

The EVP believes that it is not necessary for Corporate Services to have all stores polled since the information is mainly used for trending. However, the data coming in must be a representative sample of stores and must present a true picture of the company’s status.

At my level, I’m usually interested in what the trend is. Trending is very important so you are seeing how things are moving along. As long as that is telling you the direction that you are heading, then I am happy. It’s the old 80, 20 rule. You are pretty darn close. Now if you are continually waiting to get 100 percent of the information, once again you will never get the information (EVP Corporate Services).

Rate of Sales Report

This report is mainly used to understand what is selling and the financial impact that those sales are having. It is also used for what-if scenarios to analyze pricing or costs. The Rate of Sales Report provides the VP with some of the detailed information he is looking for.

This tells me by sales category if my menu groups, what the food costs is from those groups you know how many we’re selling of those, you know how much money we’re making off of those sales, total costs, your margin, this tells you the health of these given sections (VP Food Services).

The ROS report is also useful in assessing the performance of menu categories, especially if a new menu item is introduced.

Say we booted out Campbell’s pre-made soup and brought in Kellogg's pre-made soup, now I see my soup sales as a percentage going way way way down, I’ll say oh oh we got a problem, they probably aren’t liking our soup program, we need to address it (VP Food Services).

The report also helps to determine if further training is necessary in the restaurants.

Say for example our add-ons or extra toppings, if I see that sales category shrink and nothing else has changed, I’m actually going to assume that our training
materials aren’t very fresh and we haven’t focused on training staff on how to sell extra cheese on a pizza or skewered prawns with a steak, so I’ll talk to the director of training and development and say ok lets have a review of the material, how do we train that in a new store opening, how do we keep that fresh in peoples minds. So that’s part of what I’ll get when I see the sales mixes here (VP Food Services).

Areas for improvement:

- This report needs to be broken up into two parts as it is becoming complicated. The first part should include promotional items and the second should include trend analysis (past month or year’s data).

  The challenge with this report is that it does not show you promotional items and if you sell 10 or 15 percent of a feature sheet, or promotion or whatever it may be, it sucks sales out of here. So you see the impact it has on this, but you have no measurement of what happened on the other side (EVP Corporate Services).

- The VP pointed out that the ROS report’s main drawback was its impreciseness. The report uses only costs from the Corporate Training Centre and did not take into account surcharges and freight costs which may be levied on locations that are further away. This would therefore affect the theoretical food costs.

- The ROS also does not give an indication of which stores are being inefficiently operated as it uses average figures from all the company’s franchisees.

  This report is everyone combined. So it takes the good operators and the bad operators and averages them out, so for making the macro decisions this is good, as the tool to decide whether specific stores are doing well, this doesn’t help you very much (VP Food Services).

*Marketing Promotion Report*

This report gives Corporate Services a good snapshot of how a promotion did when compared to the previous year. It gives the impact that the promotion had on the business and identifies the items that were popular. Successful items may later be incorporated into the core menu.
The other thing I use this report for is that an item becomes a feature on our main core menu that’s year round, it is normally debuted on a national feature, so based of its success on the national feature we’ll decide whether or not it’s going to make it to the main menu. So I would look at reports like this to see what worked and what didn’t work, and then make recommendations as to what should get bumped from the main menu to make room for it, if anything (VP Food Services).

Area for improvement:

- The information on the marketing report may be arranged by provinces to provide an overview of what is selling in which province. Popularity of some menu items as well as pricing varies according to the provinces or menu groups.

Monthly Sales Reports

This report is mainly used to see what happened in the stores during the previous month. It is used to give a quick overview of the average cheque and how each region is performing. This report is also used to look at how new and recently renovated stores are performing. The Monthly Sales Report gives a big picture of sales and sales in individual markets. Corporate Services also uses this report to look at the mix of sales. With the introduction of the Weekly Sales Report, this report is now considered to be quite good. The Weekly Sales Report provides timely but incomplete data. This is not seen as a problem as it is mainly used for trending purposes. It supplements the Monthly Sales Report which is accurate but not timely.

The VP is particularly interested in the average cheque of the Weekly Sales Report as this allows him to gauge the effectiveness of the franchisees’ pricing strategies and adherence to Y% food cost model. A restaurant’s inability to keep at or below the Y% food cost may be a red flag that the franchisee and the restaurant’s staff may need to be retrained.

I look at the average cheque an awful lot because although the franchisees get to set pricing. My department needs to create food that can keep a certain price point, a certain average cheque. So if it’s getting too low or too high then we’ll start thinking maybe we need to bump prices in that given area or maybe have more entrée offers because everybody is just sharing appetizers or whatever…. Liquor percentages are interesting as are food cost percentages, our whole
company is founded in having Y% food cost. So having access, as soon as you see stores that are going over that, that’s when you start looking at the specific stores saying ‘that store is at A% and that store is at B% and that store is at C%’. At that time my job is to decide at that point whether it is the pricing strategy that that franchisee took or is it poor operations (VP Food Services)

Area for improvement:

- Getting this report on the 2nd or 3rd of the month as opposed to the 10th.

Overall Rating

When asked to rate his access to the appropriate information for making decisions on a scale of 1 to 10, with 10 being the highest, the EVP of Corporate Services answered between 6 and 7. His major gaps are in the timeliness, accuracy and user-friendliness of the data.

While the VP said that his access to data deserves a 10, he however rated its timeliness at a 6. He indicated that his inability to use the numbers is rated at 2 or 3.

Purchasing

The information below was put together from an interview with the Senior Buyer and the Director of Purchasing. It also includes excerpts from an interview with the VP of Food Services, who has overall responsibility for the Purchasing Department.

Role of Purchasing

- To coordinate and manage the contracts for all ingredients, equipment, restaurant fixtures and paper products used by franchisees

- To ensure that franchisees get the best price across the country for the products that are on the menu and that those product are of consistent quality

- To manage relationships between the supplier and Company XYZ and between suppliers and distribution centres
- To manage the distribution and inventory of stocks
- To deal with product complaints, concerns, questions, ideas and suggestions from franchisees
- To manage the revenue generating rebate service that is offered to the franchisees
- To maintain the desired food cost percentage and sales mix

Information Needs

Purchasing uses sales data from stores to determine how much product is needed and how much to send to distribution centres. This is done through velocity reports which project and track sales volumes. Therefore, the department needs to have a good picture of what is happening in all stores. Data is also used to follow food costs and sales mix, two things that are critical to Company XYZ’s success.

Reporting Wish List

1. Getting True and Hard Data from All Stores

A key need of the Purchasing department is having access to data from all stores. Since they are cognisant that it is nearly impossible to get one hundred percent of the stores to send in their data on a regular basis, the desired alternative is knowing which stores the data is coming from in order to extrapolate. Ideally, Purchasing would like to be able to see what is selling in each region and then figure out volumes at an ingredient level.

A lot of the sales reporting that we get is of course only by the number of stores that report, because they are not all in the system. So for me, say we are heading into a major promotion and I’m trying to project how much product we need or how much to send to each distribution center so that they can delegate it out to our restaurants, it becomes a bit of a guessing game. That is problematic for quite a few reasons. … you really try and rely on true data, true hard numbers because they at least give you that benchmark because the project is itself subjective. So if you are starting to deal with a subjective baseline and adding more subjectivity to it to get to your end result, by the time you get to the end, you may not be nowhere near where you should be (Director of Purchasing).
Each region kind of performs differently. ... You start to say where is my data coming from. Is it coming from my strong area that reflects really high volume or is it coming from my slower areas and I'm going to have to bump up a little to compensate (Director of Purchasing).

2. Linked Databases of Recipes, Nutrition and Allergen Charts

Purchasing is also in need of a database to store ingredients and their costs, allergen, recipes and nutritional information. Purchasing believes that this information should be controlled by the head office as polling this from the stores often leads to errors. The Senior Buyer describes this situation in the following statement.

I think that one of the biggest things that we need to accomplish here is managing those databases; using our numbers, what has been set out by our guidelines, with no interference and no data from the field coming back into here. That is what a baseline should be.

Purchasing also believes that departments responsible for the information should be in charge of keeping it up to date. For example, Purchasing should be accountable for the ingredient costing information in the database and Menu Development should be responsible for keeping the recipes up to date. The process for updating this information should be standardized to ensure that it is being done correctly and regularly.

I should be accountable for the pricing that is put into that system. That’s what I am responsible for. That’s what I manage, but right now, I don’t have any control over that (Senior Buyer).

I don’t know if IT really should be the ones accountable for all that (information). The framework should be that it is easy access for us to give them the correct information and they just generate it and manage the process (Director of Purchasing).

Lastly, Purchasing would like to have more accurate costing by ensuring that regional differences in food costs are captured. Currently, costing information is supplied by the Corporate Training Centres.

If I have an item that has a pricing that is different across the country, it may be a dairy scenario. ... then they can go in each of those menu groups that they’ve got
in their master menu group downstairs and set it up with the right prices so they can generate reports off that information. With a database, you've got it right there, you know when it was last updated, they know that they are getting the information in there correctly and we are all getting it from the same source.

3. What-if Scenarios

Purchasing would like to be able to perform what-if analysis in a much cleaner, quicker and concise manner. This is presently done manually. As discussed above, actual numbers are not available to facilitate this. What-if analysis becomes less scientific when dealing with incomplete datasets. Below is an example of how the team would use this type of analysis.

We may be looking at moving to a roast beef that is more expensive. What is the impact going to be on that? But let's say we also have something else happening in the background with another product. You can start doing some what-if scenarios. I think that would be something that would be hugely beneficial (Senior Buyer).

4. Link between Menu and Food Items

Currently Purchasing is not able to query the database to know which menu items contain a certain ingredient. This would be useful to forecast changes in food costs due to a price increase of a certain ingredient.

I can't pull a query and go give me every item that has chicken in it and give me a report on the sales for that. It doesn't have the capabilities at this time for to do (Senior Buyer). ... We had to do it manually. We had to go into the recipes to find out which items and then request the sales report for those items (Director of Purchasing).

5. Web Access to Reports and User-Driven Reporting

Purchasing would like to access reports online, making them easily accessible to people who are out the office. Purchasing would also like to have the ability to manipulate reports in order to get the required information.
6. Linking Invoices to Company XYZ's Item Numbers

When Company XYZ receives invoices from distributors listing what stores have purchased, the item numbers used do not correspond to Company XYZ's item numbers. For example, crushed tomatoes may be item 123 in Company XYZ's system but 456 in a distributor's system. To make this even more complex, the distribution centres may not even be using the same codes. Therefore reporting on what has been purchased by the stores is difficult. This has been identified as an information need that is presently being addressed. The project should be completed by the end of the summer.

Rate of Sales Report

This report is used by Purchasing to monitor several goals in terms of food costs and sales mix. The following quote from the Director of Purchasing describes the uses of this report in detail.

So we look at our costs on different items and try to figure out as we compare our cost versus their (competitors) costs to see whether we have room to move; whether we are over priced or under priced, whether we are leaving money on the table. You want to do all of those evaluations. And then certainly by category, you want to be looking at the food costs, as a group and monitor that. You want to look at the quantities, to look for trends and see if things are starting to fall off.

Areas for improvement:

- Availability of trending information. This report should compare data to past months and/or past years.
- Data should be presented regionally due to purchasing and sales differences across the country.
Marketing Promotion Report

Purchasing uses this report for two main reasons. The first is to forecast, based on sales, the amount of product that needs to be sent to distributors. Purchasing looks at this data on a weekly basis to ensure that stores do not run out of ingredients during a promotion. The second purpose of this report is for menu development. After a promotion has finished, Purchasing looks at how each item sold and decides whether any should be considered for the next year’s core menu.

Areas for improvement:

- Devising a method to take the data from stores currently reporting and extrapolating it to get a complete picture of what all store sales would look like.

- Being able to compare the same number of stores from one year to the next. This is the only way to compare like variables.

- Being able to see regional numbers since each region performs quite differently.

New Stores Report

This report is not heavily used by Purchasing. It simply serves as an information source to gauge the sales of new stores.

Monthly Sales Report

This report is used for cursory information. The Director of Purchasing summarizes his use of this report in the following statement:

Again curiosity more than anything; I read it a little bit. You can go through it line by line by store but it’s really helpful for trending. I don’t use it a lot because what the stores do on a sales basis level is important to me for the big picture but not to micro manage down to the store level so much. So our department doesn’t get involved too much in that.
Overall Rating

When asked to rate their access to the appropriate information for making decisions on a scale of 1 to 10, with 10 being the highest, both members of the Purchasing team answered 3. The major gap identified was the need for a database to store ingredients, recipes, nutrition and allergen charts. Specific departments, instead of IT should be accountable for the accuracy of the data which they generate.

Corporate Chef

The information below was put together from an interview with the Corporate Chef.

Role of the Corporate Chef

- To create recipes and develop the culinary programs for Company XYZ in Canada
- To make sure that items on the menu are profitable and adhere to Y% food cost model

Information Needs

The Corporate Chef needs information that stems from two areas. The first deals with information regarding items being tested on feature sheets or national promotions. The Corporate Chef needs this information to track the performance of these items across the chain and in particular markets. The second area deals with the menu itself. The Corporate Chef monitors the performance of menu items in order to identify trends. This information is used to determine what should stay on the menu and what should go.

Reporting Wish List

1. More Timely Information

The Corporate Chef expressed the need for more timely information. He cited the marketing promotion report as an example.
We get calls from franchisees saying why did you put this on the menu. We can’t sell 3 of them a day. … If we had a report on a weekly basis, we could tell them well it is the number 2 seller in the promotion. So it is your store. It is ammunition for our point of view. If that report came out a couple of days after the first week and subsequently until the end of the promotion, that would be great.

2. Trend Reporting

The Corporate Chef needs to be able to see what is happening on a continuing basis when a new menu is launched. He also needs to see trends in food cost and sales mix in order to ensure that both are adhering to corporate targets.

I would like to see historical data … months, not so important as maybe quarters because it is long term stuff that we are looking at. There can be monthly glitches and that sort of thing.

3. Easy Access to Reports

The Corporate Chef would like to access reports without having to ask someone for it. He does not wish to manipulate the information and simply wants easier access to the final reports.

Rate of Sales Report

This is the main report used by the Corporate Chef. He uses it to monitor the performance of items across regions. The ROS report is the basis for the menu analysis chart that helps to determine what items should remain on the menu based on costs and sales.

Areas for improvement:

- Include trending information if a separate report cannot be created for this.

- The report should be formatted in a more user friendly manner. The column headings should appear at the top of each section and lines across the page should be added to make numbers easier to read.
**Marketing Promotion Report**

This report is used to assess how new items are selling in order to determine which should be included on future menus.

**Area for improvement:**

- Should be available in a more timely manner. A few days after the end of the promotion is preferable.

**New Stores Report**

The Corporate Chef does not use this report.

**Monthly Sales Report**

The Corporate Chef does not spend a lot of time on this report. He mostly refers to the summary and rarely looks at how individual stores are performing. Of special interest is the average cheque figure.

We want a higher cheque and it is interesting to see which regions in the country have a higher cheques and why. Is it because they have higher selling prices or is it because they have a different menu mix. This may influence how we promote a certain area of the menu.

**Overall Rating**

When asked to rate his access to the appropriate information for making decisions, the Corporate Chef answered 7. His gap was due to the inaccessibility and difficulty in using the data.

**Marketing**

The following information is taken from an interview with the Director of Marketing and the Vice President of Marketing.
Role of Marketing

- To oversee all national marketing activities and strategically manage the brand
- Working in conjunction with the advertising and public relations agencies, develop marketing and PR campaigns
- Conduct research and work with Corporate Chef in menu development
- Provide the tools to support local marketing in the western and eastern Business Management Units
- To manage the co-op marketing fund and ensure that franchisees have the right tools, such as brochures, to sell the concept and drive new franchise business

Information needs

The marketing team is the steward of the Company XYZ brand. It is responsible for the direction and strategy of the brand on a national level. The team therefore needs information that will help them assess the current state of the brand as well as identifying new opportunities to grow the brand and/or take it in a new direction. This information will help them to proactively introduce new ideas, new food products or new service styles. It is important that Marketing receives information that deepens their understanding of their customers’ habits, attitudes and behaviours in order to develop effective communication messages and channels that reach their target market.

1. Information to Assess Promotional Activity Success

The marketing team is not only responsible for the overall brand management but also for providing effective tools to help the business units conduct effective local marketing. In achieving this aim, the team needs information that measures the success of their efforts as well as identifying new opportunities to drive sales.
The team also has a standard weekly promotion. Although this initiative has been running for several years there are no measurement tools in place to evaluate its performance. Such tools are necessary to determine whether the promotions are still contributing to sales or whether adjustments are necessary. Marketing also finds it difficult to get sales information for items on specific menus such as the low-carb menu.

Rate of Sales Report

From the Rate of Sales Report, the Marketing team is able to see whether there are increased sales in specific categories. If a promotion is done in the same period of the report, the team is able to get a broad idea of marketing impact.

Area for improvement:

- The report does not take into account promotional activities. For example, Company XYZ may decide to run a promotional campaign for personal size pizzas. If the Rate of Sales indicates a boost in the pizza category, the team may assume that this increase is due to their efforts. They are however unable to determine any specific numbers or percentages.

Marketing Promotion Report

The Marketing Promotion Report is the scorecard for this team. It directly measures the performance of a specific marketing initiative.

Area for improvement:

- The report offers aggregate figures across the country, broken down by weeks. A more detailed report that allowed users to drill down and view the information categorized by regions, days or stores would be very useful.
Again the Monthly Sales Report provides Marketing with an imperfect tool for evaluating the impact of their activities on sales. If a promotion is being conducted they are able to eyeball whether sales have improved or declined during the period. It alerts them to flagging sales. On further investigation, they may be able to determine whether further marketing effort is necessary.

**Area for improvement:**

- The information should be further broken down by regions and day parts.
- The store’s delivery sales and take-out sales should be separated. Currently, both these figures are combined on the report and appear as TOAD (Take-out and Delivery).

**Overall rating**

Both the Director and VP of Marketing gave a rating of 4 to their ability to access the relevant information for decision making purposes.

**Western Business Management Unit**

The Executive Vice President of the Western BMU gave some interesting insights into the information needs of the company. He was satisfied with the information that he currently receives to do his job because much of it is created within his department. He however, understood the frustration of other departments having previously been in the Corporate Services Division.

**Role of the BMU**

- To support the operations of franchise stores in Western Canada
- To provide local marketing support to stores in the region
To ensure successful set up of new stores

Information Needs

The EVP of the Western Business Unit is responsible for the successful operations of all stores in Western Canada. He therefore needs information that allows him to determine the viability of expansion plans and to assess the success of the stores currently operating in his region.

1. Information to Assess New Markets

The EVP is responsible for the roll out of new franchisees in the Western region of Canada. To support this drive, it is necessary to have information on the market and be able to project the sales figures from the market. Currently they use their own in-house pro forma income statements to assess the viability of a potential new store and its market. While much of this information may be gathered outside of the POS system by way of the Air Miles program for example, the EVP is also able to levy the POS systems from similar markets. For example, in order to build forecasts of how the new store will perform they may look at the figures from similar stores in markets with similar characteristics.

... for instance if we’re going to go to Terrace, which is one of the markets we’re looking at up north, we have a store in Smithers, similar size, similar kind of communities, that kind of thing; you probably use those two as comparative. You’d take Williams Lake, Smithers, some of those areas and compare them and that would be how you’d come up with your assessment.

2. What-if Scenarios

The EVP posits that the issue is really not just having many different reports; it is also having the ability to go deeper into the information if necessary without having to involve the IT department. Many of the questions are related to what-if scenarios where parameters are set. He proposes that some of these what-if reports may be set up in the system. Many times the variables
that need to be manipulated stay constant. So a set of pre-formatted what-if reports may be possible. He used an example of Edmonton to illustrate this point.

We have a number of reports that we do, but for me it's that whole thing in the ability to have someone sit down and write a 'what-if' report that just have the same parameters and if we could have those parameters and the parameters don't change a bunch. Like I said, it's usually based on menu item mix, menu group and a time period, you know and then we try and poll that information... Edmonton wants to change its prices, we just want to take that pricing column and change that. We won't change anything else, we won't change what's sold or any of those things. We'll just change the pricing column. Spit out the same report and it will say, ok well you sold, you know in the month of March, you sold all these items at these prices and it gave you this revenue.

Rate of Sales Report

The summary ROS report gives a broad picture of the food costs per category. The detailed report gives more information such as the how much of an individual item is sold and its food cost. This is a good measure of how well an item is doing in the market.

There's a Rate of Sales detailed report and it has all the information behind this and that tells you how each individual item sold and what the food cost was for it. So that's important to get stuff like, can we put 5 new pastas on the menu, how are they selling, are they ranked number 1 in their category, 3, 5, whatever that kind of thing.

If a franchisee calls to complain that a new menu item is not working for them because it is difficult to prepare in the kitchen or the food cost is too high and it is not selling, the staff in the BMU can use the ROS to see how it is doing in other stores. This helps them to determine whether the item is indeed troublesome or whether the problem is due to operations in the franchisee’s kitchen.

We would look at a report like this to say well how is it selling? What is the food cost? You know, and then we would go out and do the, look at the empirical evidence in the store and say ok, is it difficult to do in the kitchen or do they have a problem there and that kind of thing.
Area for improvement:

- The report should allow manipulations in order to facilitate what-if scenarios. Through this function, the team is able to determine the effect that a change in one variable such as price would have on the food cost and the overall performance of the item.

Our company is broken down in all these menu groups, we have Y menu groups. So the Edmonton menu group might phone and say, we want to do some prices, we want to revise some prices on our menu, we want to know what impact it’s going to have on our revenue and food costs, that kind of thing. Here are the prices. So then you would go to this report and we’d want to put that in, so we’d just take the current sales mix and everything, we’d drop in these new prices and it would spit it out and say, ok, you’re food costs went from D% to E%.

It should be noted that the ROS report is used here with some amount of scepticism with regards to the reliability of the information it contains.

*Marketing Promotion Report*

This acts as the report card for promotions, giving the BMU an indication of how marketing impacted the franchisees. The BMU Head gives an overview of how he uses the report.

We would look at a report like this to say well how is it selling? What is the food cost? You know, and then we would go out and look at the empirical evidence in the store and say ok, is it difficult to do in the kitchen or do they have a problem there and that kind of thing?

He however uses the Marketing Report in conjunction with the Monthly Sales Report to see if there is a corresponding increase in the sales in the month that the promotion was taking place.

Area for improvement:

- The report comes out 2 to 3 weeks after the promotion has started. The EVP stated that it is normal to make the bulk of the sales in the first 2 weeks that a promotion is launched. Therefore if a feature is run for 1 month and the report doesn’t come out until the 2nd or 3rd week it is usually too late to make adjustments.
Monthly Sales Report

From this report, the BMU is able to ascertain what is selling and what is not selling, so that they are able to provide feedback to the Menu Development team. It gives an idea of how same store sales are doing so that the EVP can follow the success of each store. In his opinion this is great report because it is accurate and complete. The Weekly Sales Report allows for this information to be seen within a shorter time.

We use this obviously in Operations to look and see what menu items are selling and working and might want to recommend Corporate Services work on to change. And then the sales part obviously is our report card. So we look at that to see are we doing the right things, are we succeeding in growing our business.

Area for improvement:

- Both the Weekly Sales Report and the Monthly Sales Report should be structured so that they give the same information in the same format.

Overall Rating

The EVP rated his access to information as an 8 on a 10 point scale. The gap he found was related to the lack of drill-down capabilities, day part information and credible information in the ROS report.

Vice-President of Finance and Administration

This interview was conducted with the Vice-President of Finance and Administration at Company XYZ.

Role of Vice-President of Finance and Administration

- To manage the accounting department, human resources, the administration staff; everything from reception to financial accounting
To oversee the production of financial reports such as regular monthly accounting statements for the operations team.

To oversee the production of quarterly reporting, press releases and annual reports for shareholders and investors.

**Information Needs**

It is important to note that Accounting is more of a producer of information rather than a user. The accounting department generates the monthly and Weekly Sales Report for operations. The department’s focus is on sales reporting, financial reporting and collecting franchisee fees. The Accounting department needs accurate timely data to create the decision making reports that fulfil some of the information needs in other departments. The VP believes that all the information her department needs is there, but it is not always available in timely manner and may not be accurate.

We can access everything. It’s just how quickly, and how efficiently and accurately it is coming to us. That’s the biggest concern. It is only as accurate as the polling system or as fast as the polling system.

**Reporting Wish List**

1. **Eliminate Double Data Entry**

   Accounting is working on an initiative to import data from the POS system into the accounting system. Currently, sales data stored in the POS system is entered manually into the accounting software. Creating an interface between the two systems will remove the need for this double data entry in corporately owned and operated stores.

2. **Roll-out Standard Tools to the Franchisees**

   After eliminating double data entry in the corporate stores, the solution should be available to franchisees. To alleviate this problem, the new stores will be outfitted with the latest
version of the POS system as well as a standard accounting package. Currently, financial
statements from different stores appear in different formats. Having a standard accounting
software with pre-designed formats can help to reduce these inconsistencies in reporting and will
facilitate the easy interpretation of these statements.

3. More Timely Information

The Weekly Sales report is always a week behind due to the 5 or 6 days it takes to poll
the stores. While, polling the stores has made information available more quickly, the ideal would
be to have access to the data the next day. The following statement summarizes this need.

I mean the sooner you get your information, the sooner you can make some
changes. Right? So, that’s the problem inherent with financial reporting, it’s
already history and if you can’t be reactive quickly then. … Next day would be
great…the new franchise agreement which says that by the 10th of the month we
can actually get their data. So already we are 10 days late.

Overall Rating

When asked to rate her access to the appropriate information for making decisions the VP
of Finance and Administration replied that all of the information required is available.

So if we are looking for salary info, it is all accessible with market data and
market surveys. … If you start talking to operations or menu development you
are doing to get different responses. But for us, there is nothing that the outside
world could tell us to make us change. It’s their requests that drive what we do.
It’s the other way around for us. We are more doers rather than receivers.

Information Technology

The following section describes the information gathered from interviews with the VP of
IT and a business analyst. It is clear from these interviews that IT is aware that it is not currently
meeting all of the needs of its users. The barriers to providing users with the information they
require are covered next. This is followed by a description of IT’s strategy, initiatives and tools.
Reporting Barriers

IT has identified several key barriers that have prevented it from providing users with the information they require. The first and most important is having access to the data. No dedicated lines exist between franchisees and the head office. Therefore obtaining electronic data on a regular basis from these stores has been a challenge. Some stores do not have POS systems, while others do not have modems. It is also a challenge to get stores to agree to be polled. Information required from other departments has also prevented the inclusion of certain data. For example, the addition of promotional items in the ROS report has been difficult in the past as food costs and pricing for the items have been unavailable.

The second challenge has been understanding the data. Users must understand what they are looking for in order to ensure that the data is being captured properly in the POS system. For example, if users want to report on promotional items, separate item numbers must be created in the POS system. This requires cooperation between the IT and Marketing departments to ensure that needed information will be captured. Related to this point is the fact that people are not aware of the IT resources and tools available. For example, what-if scenario tools exist but are not readily accessible to all users because it takes a high level of skill to manipulate the software.

Data accuracy has also been an issue due to a number of reasons, including franchisees altering information in the system. This has resulted in erroneous reports, which the executives at Company XYZ use with a great deal of scepticism.

IT has also lacked the appropriate resources to promptly respond to information requests. Only recently has a business analyst and a person dedicated to polling been hired.

Finally, different user groups have very different needs. For example, the US needs more detailed store by store reports to manage the business. In Canada, both summary and detailed information is required. The challenge for IT has been to develop reports that meet the majority of these varying needs.
IT Tools

IT uses three tools to provide users with reports: a Visual Basic application integrated with Crystal Reports, a web application and Cognos.

The Visual Basic application enables IT to manage the stores. For example, a store can be associated to a menu group and IT can see the last time the store was polled. Most of the existing reports such as ROS and Weekly Sales reports are produced in this application using Crystal Reports. This application does have some drill-down capabilities, but few users have access to it, because of its difficulty to use.

Web reporting is currently used to generate the Weekly Sales Report. All of the Visual Basic reports will eventually move to this platform. The idea is to provide users with a dashboard of key indicators accessible via the Intranet. Drill-down capabilities will be added in the future.

Cognos is a sophisticated and complicated tool that is only available to IT. Cognos requires a great amount of expertise to define the dimension needed on a report. This tool is powerful as it is able to produce reports from both summarized and transactional data. This means that any data captured in the POS system can be reported on.

IT Strategy and Initiatives

The major initiative that IT has been working on is validating the data through an automated process. This process is designed to ensure that only correct data is inputted into the data warehouse, by including business rules in the process. These business rules compare the data against standards set by the business in order to detect anomalies within the data. For example, the process compares current sales to past sales to ensure that the numbers make sense. Furthermore, this process captures the errors caused by modifications to the system by the franchisee as well as transfer errors.
Another key initiative has been polling data from the stores on a daily basis. This does not mean that daily information for all stores is available. Rather, a number of stores are currently being polled on a regular basis. Those stores not being polled daily either do not have the technology in place or do not permit daily polling to occur. For example, if the modem is off when IT tries to poll, the data for that day cannot be transferred.

One of IT’s strategy is to standardize services across Canada and the US in order to facilitate support. When developing a report for one country, IT takes the needs of the other into consideration. This will help to minimize the number of reports created and maintained. IT does not want to create reports that people do not use. Business needs however must drive the data tools used and reports produced.

In order to make reports more accessible, IT is moving away from Crystal Reports and is instead developing reports accessible through the Intranet. IT does not want to install and maintain the Visual Basic application containing the Crystal reports on the various workstations. IT will begin by offering static web reports and then enable drill-downs. Another improvement will be the addition of legends to reports. This will ensure that people understand how the report was built and what the numbers represent.

IT is also working on a project with Accounting to auto debit franchisee fees every month rather than waiting for a cheque in the mail. IT is also working on eliminating double data entry by creating an interface between the POS system and the accounting system.

Lastly, in order to meet the needs of Food Services, IT is looking to buy a database to store recipes, ingredients, nutritional and allergen information. IT’s strategy has always been to try to buy a package rather than developing a tool in-house. An off the shelf product reduces the amount of maintenance and support needed and helps IT focus on its core competencies.
This section of the paper identifies the common information needs of the various departments and executives. It compares the differences between the information that executives currently have and the information that they require. This section also addresses the areas of improvement for existing reports and presents overall recommendations.

Common Information Needs

Table 5 summarizes the common information needs that are not currently being met within Company XYZ. The commonalities across all departments and executives are highlighted and discussed below.

Timely Information

Obtaining information in a more timely manner was the most frequently identified need. This is consistent with the literature by Watson, Houdeshel and Rainer (1997) that posits that an important attribute of information is timeliness. Although most interviewees acknowledged that the situation has improved over the past few months, they believe that there is still room for improvement. For example, the Monthly Sales Report in the past took at least 15 days to reach the end user. Now, this report is available within 10 days. Most interviewees stated that this time frame may be further reduced. While this is an area of concern, the Weekly Sales Report has somewhat filled the gap for most executives by providing interim sales information.

IT is aware that users would like to have their reports in a more timely manner, however, several constraints exist. In the past, IT has been restricted by a shortage of human resources. Another constraint is the inability to obtain data from the stores on a regular basis. To overcome this difficulty, the IT department has dedicated manpower to poll the stores on a daily basis. This
drive is further supported by the new franchisee agreement that obliges stores to make their data available. Lastly, IT has been developing a process to ensure that data transferred into the data warehouse is reliable and error free. This ensures that reports generated from this data provide an accurate guide for effective decision making.

**Easy Access to Information**

The majority of executives believe that the information they need is available but not readily accessible to them. The CEO for example would like to have accessible data on core stores. Purchasing would like to have access to reports online since this method would allow reports to be available at all times. Similarly, the Corporate Chef would like to access reports himself without having to ask someone for them. As postulated by Drucker (2001), it is not sufficient to simply have the information in the system. It must be easily available to the appropriate decision maker in a timely manner.

IT’s initiative of moving reports to a web format will make reports much more accessible to users. Once this system is fully implemented, users will be able to print out their own reports and access them as necessary.

**Historical Data for Trends**

One of the most commonly cited requirements, and one that is supported by the literature, is the need for trending information to help in strategic planning and decision making. The reviewed literature states that executives set the direction of the organization and are usually involved in long-term planning (Watson et al, 1997). They therefore need a picture of where the organization is now and where it is headed. Information with a historical perspective allows executives to track trends and extrapolate into the future (Meri, 2000). This usefulness of trending information varies across departments. For example Marketing may need to see pasta sales on a year to year, month by month basis. From this they can see when pasta sales are high and when
they are low. They are then able to determine whether this is due to a seasonal variation, or whether a marketing push is needed. The Business Management Units for example need trending information to determine their busiest times and to support their franchisees with more efficient scheduling.

**Summarised Data and Drill-down Capabilities**

Executives and managers at Company XYZ have varying requirements in terms of the amount of detail needed in the information they received. Drucker indicated that the information provided must be at a level that is appropriate for the executive and should only be as detailed as needed (Drucker, 2001). For example, the President expressed the need to see data in a summarized fashion while executives in the US need to see store level detail. Related to this is the ability to drill-down on existing reports in order to see more detail. This need stems from the fact that executive decisions are characterized as non-repetitive and non-programmed (Watson, Houdeshel & Rainer, 1997). Static reports are not built to meet these needs and must therefore be complemented with drill-down capabilities.

Some executives like the EVP of Corporate Services and the President do not want to manipulate data, whereas the Purchasing department wants to have this capability. This is consistent with literature that indicates that executives prefer summaries that consider facts from all sources. They want to be able to break this information into a high level view that will support them in making quick and accurate decisions (Yager, 2004). A major stumbling block to the acceptance of executive information systems has been the reluctance of executives to manipulate data.

IT has decided to provide users with access to static report on the web. The next step will then be to develop drill-down capabilities for existing reports. IT faces the challenge of
determining the fields users want to manipulate. Currently, the ROS report does provide drill-down capabilities, but users do not have access to the application to manipulate it themselves.

**Information Displayed by Day Parts**

IT has developed drill-down capabilities to appease the users who wish to see sales and ROS information divided into day parts. This will be rolled out shortly.

**Reliable Data**

Several executives had issues with the reliability of data in the past. This is especially true of data contained in the ROS report. Most concede however that information is more accurate today. The CEO for example requires accurate information to evaluate costs, sales and promotion effectiveness. This is consistent with the literature review finding that data accuracy is key to information usefulness (Watson, Houdeshel & Rainer, 1997). Executives who are not confident in the accuracy and credibility of their information will lack confidence in their evaluation of the alternatives and ultimately the outcomes of their decision (Meri, 2000). IT has created a process to validate the data before transferring it into the data warehouse. This has greatly increased the accuracy of the data and the confidence that any decision made form these reports are grounded in credible data.

**What-if Scenarios**

Several executives would like to have the ability to perform what-if analysis. Corporate Services for example would like to see what would happen if prices increased or costs increased. This is a value-added activity performed for franchisees. Based on the research done on data mining, this functionality can fall under the umbrella of predictive modelling.

IT currently has a what-if analysis module that is not currently available to users due the high skill level required to use it. Purchasing has used the application before but has said that the
end results were incorrect. The software may return incorrect information unless the parameters are set correctly. This is difficult to do unless the user has a lot of skill and familiarity with the program.

Statistically Significant Data

Most executives do not need to have access to the data from all stores as long as they receive a representative sample. A report that contains Y stores is considered to be statistically sufficient. This is different in the US, where specific store data is needed. Although Purchasing would like to have information on all stores in order to better manage distribution of products, they understand that this is unlikely. Therefore, a representative sample may be used to extrapolate all store sales. Currently, there is no initiative to determine what a representative sample of stores would look like.

Food Services Database

The number one need for Corporate Services division especially the Purchasing department is the creation of a database to store ingredient costs, recipes, allergens and nutrition information.

IT understands that is an important need for Purchasing. Ideally, IT would like to find an off-the-shelf application for this purpose. This would reduce the amount of in-house support and development required.

Corresponding Supplier and Company Codes

Another key need of Purchasing is the ability to track what stores are ordering. This is difficult as suppliers and Company XYZ do not use the same codes to represent items. This validates the point presented by Drucker (2001) that information should be organized in such a
way that it is useful to the decision maker. IT and Purchasing are working on an initiative to link these two codes.

**Recommendations**

Three key concerns that users had were the lack of information timeliness, accuracy and accessibility. These have all been identified by Drucker (2001) as being needed characteristics of information. IT has already implemented a validation process to ensure data accuracy. Furthermore, accessibility will be greatly improved once all of the reports have been migrated to the web. The issue of timeliness has been greatly improved through polling. A key reason for the lack of timeliness is that all stores cannot be polled daily. As such, a representative sample should be sufficient to extrapolate information on all stores and identify trends. Company XYZ needs to determine which stores should be part of this sample in order to get an accurate picture of what is happening across the country. Therefore daily reports can be developed from stores that can be consistently polled. A few key stores may be selected from menu groups and regions.

A second area that IT should work on is educating people on what reports and tools are currently available. Some executives asked for tools and reports that IT has already developed. In light of this, a structured approach for making information requests of IT should be implemented. A standard form can be instituted on the company intranet to capture requests and preliminary information for the new report. Before developing the report IT should solicit feedback from several departments to ascertain whether this proposed report may also satisfy their need. Reports need to be designed in such a way that they meet the majority of users’ needs. IT will then prepare a prototype document that must be approved by the requesting department before any work is done on development. This process would increase the efficiency of developing reports and ensure that the end results meet the need.
Thirdly, most executives expressed the need to see trends as this allows them to track the
direction of the organization. Therefore, trending information on key measures such as theoretical
food costs should be made available.

Lastly, being able to drill-down on existing reports is a common theme among
executives. More specifically, executives want to be able to see data by region and stores. By
creating summary reports that can be expanded, users' needs for both detailed and summary
information can be met.
Table 5: Common Information Deficiencies

<table>
<thead>
<tr>
<th>Timely information</th>
<th>CEO</th>
<th>CFO</th>
<th>President</th>
<th>Corporate Services</th>
<th>Finance</th>
<th>BMU</th>
<th>Marketing</th>
<th>Purchasing</th>
<th>Corporate Chef</th>
<th>U.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy access to information</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical data for trends</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information displayed by day parts</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drill-down Capabilities</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliable data</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What-if scenarios</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistically significant data</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food services database</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corresponding supplier &amp; company codes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summarised data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Areas for Improvement by Report

Tables 6 through 8 summarize the suggested areas of improvement for certain key reports used at Company XYZ. The commonalities across all departments and executives discussed below.

Rate of Sales Report

The ROS report presented the most challenges for the executives. The most cited reason being its history of errors and as such it is surrounded with much scepticism regarding its accuracy. As discussed in the literature, executives must be able to trust their information sources in order to have confidence in the decisions on which the information impacts (Meri, 2000).

Further Breakdown of Reports

Probably, one of the most common requests with regards to the ROS report is that of sub-categorization. The report currently shows food costs, average cheque and the sales mix for the entire Canadian chain of Company XYZ stores. Due to variances across regions in the sales mix, costs structures and sale prices, interviewees believe that further breakdown of these categories by region would be very useful in giving a more detailed picture.

Trending Information

One of the challenges with the ROS report is that users are unable to see whether their food cost or sales mix have been improving or declining over a period of time. Presently, in order to get this picture, users would need to arrange several of these paper reports side by side or manually plot the figures in an Excel graph. Trending information is critical in identifying useful patterns, such as peak periods.
Include Promotional Items

The report presently displays the performance of the sales mix. It however fails to take into consideration the effects of a promotional campaign on this sales mix. Highlighting the items that are being pushed in a marketing campaign would give an indication of how the campaign is impacting the sales of advertised menu items.

Other Requests

It was also suggested that the ROS report can be more timely and that what-if capabilities be built into the report so that executives would be able to see the effect that a change in price has on sales mix and food costs for example.

Rate of Sales Report Recommendations

IT currently has a tool which allows users to drill-down further into the ROS report. IT however does not want to install this application on individual computers as it requires maintenance to do so. Instead, IT will change this report to a web format. When this report is migrated to a web-based format, incorporating drill-down capabilities to the store level should be made possible.

The ROS summary report should remain in its present format. This will meet the needs of users such as the President who require macro level information. For those who want more information, the detailed ROS should be organised by region or cities where possible. It is however not recommended that the ROS report be taken down to store level until the report becomes fully web based. Trending information on food costs and average cheque should also be included in this report. This can be accomplished by adding a summary page on the front of the report to show these historical trends. Promotional items should be included as an additional item in the sales mix allowing for easy identification of campaign impacts.
One of the issues that fuel the report's association with inaccuracy is that of food costs. The report uses the cost from the company's training centres. This does not represent the true cost across the chain and is not ideal. Once the project to collaborate Company XYZ's and their supplier product codes us completed, cost information from each store can be easily calculated and aggregated if necessary.
Table 6: Common Areas for Improvement – Rate of Sales

<table>
<thead>
<tr>
<th>Area</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include promotional items</td>
<td>&quot;The challenge with this report is that it does not show you promotional items and if you sell 10 or 15 percent of a feature sheet or promotion, it sucks sales out of here. So you see the impact it has on this, but you have no measurement of what happened on the other side&quot; – EVP Corporate Services</td>
</tr>
<tr>
<td>Include trend information (past years, months)</td>
<td>&quot;What it is not showing us is the trend. It sits in about; if you can line up 12 of these in a row turn the page over and look all of the way down, food sales that would be it. To me, the one piece that is missing is the summary what has been happening in the past so you can visually see the trends. Because once again this is a snapshot&quot; – EVP Corporate Services&lt;br&gt;&quot;You use it as a benchmark, having read that week after week after week and getting used to what those numbers are. And I think one of the things from a standpoint of somebody who would start reading that report or using that report, is that there isn’t an actual benchmark&quot; – Senior Buyer.</td>
</tr>
<tr>
<td>Breakdown of information into sub categories such as regions and stores</td>
<td>&quot;As much as we try to do that, when we negotiate our contracts, we want a price into the distributor that is the same in Victoria than it is in Halifax, but there’s a lot of items that are small enough that they fall under the radar and we can’t really do that.... And so you get different cost fluctuations. So again, variance in cost, variance in sales price, variance in mix&quot; – Director of Purchasing&lt;br&gt;&quot;... It’s imprecise [food cost]; we don’t have the polling from the individual stores. Like how do I describe this, back to our calamari, we say that it cost just $1 but based on what it cost us here in our store, but if you go to 1 of our stores in the north, cause of surcharges and extra freight, it may very well cost us $1.72 for that exact same item. But we still do all our math on this [CTC] because there’s so many of these to manage that we don’t have a blinded total – VP Food Services&lt;br&gt;&quot;...so that when the good operators are constantly retraining and harping on their people. They’re spot checking and having the scale on line and weighing salads. That’s where you start making your money or losing your money...This report is everyone combined. So it takes the good operators and the bad operators and averages them out, so for making the macro decisions this is good, as the tool to decide whether specific stores are doing well, this doesn’t help you very much.&quot; – VP Food Services</td>
</tr>
<tr>
<td>Be more timely</td>
<td>This is a very valuable report, but it takes a while for it to come out...you probably get it 20 to 60 days after the fact. So it’s not timely – CEO</td>
</tr>
<tr>
<td>Insert what-if ability</td>
<td>&quot;So, those ‘what-if’ reports are the ones that are canned but are really important with regards to the ROS. And that’s really the majority of rate of sales. We want to see the food cost, we want to see the overall impact and we want to see the individual item impact and we want to be able to ask question of it. If we took this item out, replaced it with this one, what would happen? If we took this price out and replaced it with this price, what would happen?&quot; – EVP Western BMU</td>
</tr>
</tbody>
</table>
Marketing Promotion Report

There were several suggestions as to how the marketing promotion report may be improved. These are discussed below.

Further Breakdown of Report

Again the executives stated that it would be useful to have regional categories incorporated in this report to enable them to assess the impact of the promotion across provinces and cities. They pointed out that what may sell in one region may be very unpopular in another. Being able to measure the impact of the promotions is necessary in order to plan future campaigns as well as provide inputs into menu development.

Improve Timeliness of Reports

As pointed out by the CEO and the reviewed literature, in order to be proactive one must have timely accurate data on which to act. Executives at successful companies are given accurate and timely data to make good decisions ("Management Information Systems", 1987). A few of the Company XYZ executives stated that they are unable to track the progress of the promotion as a diagnosis is not provided until approximately 2 weeks after the promotion has started. This does not give them any room to make adjustments where necessary.

Consistent Reporting

It is also suggested that the report does not compare the same number of stores year over year, and therefore does not allow for a level field for comparison. Purchasing has suggested however that building in a tool that can extrapolate the data may address that issue.
Marketing Promotion Report Recommendations

Before the launch of any promotion, a marketing representative should meet with the business analyst. They should outline what they wish to measure and their preferred format. IT should also be provided with the cost of the menu items and food costs. With this advanced information, the IT department is able to make the necessary adjustments in the POS system to ensure that it is capturing the necessary information in the desired format. A prototype of the report should be signed off by the Marketing team. This should all be completed before the promotion is launched. Having the infrastructure in place before a promotion would ensure that daily reports can be generated. Again, this report may be constructed from the stores that are consistently polled and extrapolated to represent all stores. The report should also show regional numbers to have a complete picture of what is happening across the country. Lastly, IT must ensure that reports are calculated in a similar fashion from one year to the next so developing trending reports is possible.
<table>
<thead>
<tr>
<th>Data extrapolation to get a picture of all stores</th>
<th>“If they are going to use X (stores), I would like this extrapolated out to reflect the full amount of stores. We are going to assume that X should give us a pretty good reflection of what the country is doing. But that doesn’t mean that these are the true numbers then. I need to go and physically on my own excel spreadsheet bump this up to reflect the number up to the actual stores. If they had that on that spreadsheet, that would be huge” – Senior Buyer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison of same stores from one year to the other</td>
<td>“And I’m pretty confident having used these numbers, the 2003 numbers, this is not reflective of the same amount of stores. I believe this report (2003) is only utilizing Y some odd stores and this one (2004) is Z. So we are not comparing apples to apples with these numbers here” – Senior Buyer.</td>
</tr>
</tbody>
</table>
| Breakdown of information into sub categories such as regions and stores | “I think that the second thing is being able to get regional numbers, market numbers. If I am looking at a promotion and I am seeing that we are 75% up across the board that’s great. But if I’m looking – I want to go to my distributors in BC, and tell them the next time we are running this promotion what they need to bring in. Well they may not be 75%. That may be driven by the Alberta market. They may have only went up 50%” – Director of Purchasing  
“By region which would be nice, again what sells over the Rockies doesn’t necessarily sell here…but by province would be very useful and then having a one page summary cause it does change but we have the same menu everywhere and again there’s so many different pricing strategies out there that its hard to say but again by province. Lasagne may have sold 4773 but does that mean we sold it for $9 in Ontario and sold 400 of those and we sold it for $15 in western Canada and only 700 there. I have no idea…” – VP Food Services |
| Be more timely | “And to get this information a month or two after the fact means that you can’t meaningfully make changes if you have to make changes. Nor can you meaningfully find the positives to help others if its old data. Right? What would we do, if we could have the information weekly? Well we could quickly assess, do we need to tweak a promotion, do we need to do something next month, do we need to help this guy, do we need to do that?” – CEO  
“After 2 weeks, it starts to be a bit of you’re on to the next thing, you know and its too late to do anything about it…if you have a 4 week promotion, 60 to 70% of your sales are going to be in the 1st two weeks. So you’ve done 70% of your sales are done before you get the information to be able to anything about a mistake and you take another week to do it, the promotion is over.” – EVP Western BMU |
Monthly Sales Report

The Monthly Sales Report is regarded as complete, accurate and reliable and is used throughout the organization. There are however two areas for improvement.

Improving Report Timeliness

The report is circulated 10 days after the end of the month. The executives feel that this is still too long to wait for an assessment of how the company did in the previous month. They posit that it is too late to identify anomalies in the last month’s figures and investigate the cause. IT must be noted however that with the introduction of the Weekly Sales Report, the issue has been somewhat alleviated.

Further Breakdown of Report into Categories

This report is already broken down by regions and stores so that Company XYZ is able to track sales to that level. Executives responsible for menu planning and marketing would like to have the sales figures broken down in categories such as day parts and weeks. They also wish to have the capabilities to drill-down as necessary. Menu Development could use this information to review their menu. This will help them determine whether keeping the current core menu throughout all stores is sufficient or whether they should be thinking about different menu for lunch and dinner for example. Such information would also inform Marketing on whether they need to launch a campaign to push sales at a certain time of day.

Monthly Sales Report Recommendations

IT is currently polling some stores on a daily basis. This information should be downloaded to a web based report that allows daily tracking of sales for those who wish to monitor. While the dataset may not be complete, executives have indicated that this is not necessary, as most wish to see a representative sample. This daily report, the weekly sales report
and the monthly sales report should however be the in same format, so that the two former reports serve as a precursor to the final monthly report.

The CEO has requested that franchise sales be separated from gross sales. This is helpful and would be compatible with IT’s initiative to install auto debit capabilities with the franchisees, as franchisee fees are calculated from franchisee sales. With liquor sales highlighted, the executives are also able to monitor the performance of the bar concept and determine whether marketing support may be necessary.
<table>
<thead>
<tr>
<th>Getting this report sooner</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;The other perfect world is that I do get on the 2 or 3rd day at the end of the period, I can get my reports. We set 10 days, I think 10 days is still too far. We do have to validate, we have to check the data but timeliness. So one day would be the perfect world, somewhere between 1 and 10 is better than we currently have right now and ensuring that that information is accurate&quot; – EVP Corporate Services</td>
</tr>
<tr>
<td>&quot;So as an example, let's take this month. We are at June 16th. So they would be sending in the report May sales. You with me. So they would say 250K in sales for their store. So we are finding that out today. That is what you did in May. Well the first week in May is 6 weeks ago. You could have had a bad week. We are not going to find that out until 6 weeks later. What good does that do us? The issue of timing. We need to know a week later, not a month later&quot; - President.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Separation of franchise and gross sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;What it lacks I think, is it doesn't tell me, you know, enough information year over year on franchise sales which is ultimately how we get our money. Talks about gross sales but it doesn't have enough information on franchise sales... because we don't collect royalties on alcohol...&quot; – CEO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Break down into day parts by regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;We've covered in this report that we're making sales, we haven't covered when we're making sales in other words a day part analysis or a week part analysis... That would be important information to have on a monthly basis at minimum to break down certain regions, on a region by region basis, to tell you what day parts are working and which ones aren't.&quot; – CEO</td>
</tr>
<tr>
<td>&quot;...this is a great report that if you could click on a store and have it broken down by percentage of the days of the week and click on it again and see night, day, lunch, you know and then click on it again and see hour by hour&quot; – EVP Western BMU.</td>
</tr>
</tbody>
</table>
6. SUMMARY AND CONCLUSION

This project examines how executives make decisions and the tools available to help them with the process. McLaughlin (1995) pointed out that successful companies ‘outdecide’ their competition by making better decisions faster and implementing them more effectively. These decisions have a major impact on the company’s strategy and the commitment of its resources to certain objectives. Perhaps the most important contributor to the success of decision making is accurate information that is timely and easily accessible. The findings in the study support the literature showing that the executives at Company XYZ required information that is timely, accurate and readily accessible.

Some executives wanted highly summarised information that provided them with a snap shot of the overall health of the company and gave them an accurate assessment of key indicators such as growth in sales. Others expressed the need for more exhaustive information, providing them with a detailed view of all areas of operations on a regional, menu group and day part basis to name a few.

Of importance to many was the ability to access this information on their own and having the ability to perform what-if analysis. In order to ‘outdecide’ the competition the company must be able to prepare for eventualities. They should be able to predict outcomes based on the knowledge they have about their company, their competitors and their market. With information from the POS system the company would be able to easily assess their company’s ability in various situations and the impact that any decision would have on the company.

Furthermore, executives wanted trending information, both summary and detailed reports and more accurate costing information.
Trending data was also mentioned in both the literature review and interviews as being crucial to understanding where the organization is headed. For sales data to be useful, it must be compared to prior years and months. This will enable executives to spot problems and/or identify opportunities.

The majority of executives expressed doubt in the accuracy of costing information on the Rate of Sales Report. As a result, a more accurate method to calculate this information should be implemented. Several executives and managers have suggested the need for a food database. This database would contain ingredients, food costs, recipes as well as allergen and nutritional information. Costing information would therefore originate from the database rather than from the stores. IT has not started looking into developing or buying such a database.

IT is currently working on many of the issues brought up by executives. Key initiatives have focused on making data more timely, accurate and accessible. Implementing a more formal or standardized process for requesting reports would help to ensure that ad-hoc and new reports are provided in a more timely manner. A true challenge that IT has been faced with is understanding what information users need from the system. This is consistent with the literature that suggests that determining information requirements is the most challenging step to developing a decision support tool. Users must be willing to invest time in ensuring that IT truly understands their information needs.
APPENDIX A  List of Interviewees

Chief Executive Officer

Chief Financial Officer

Chief Operating Officer – United States

Chief Financial Officer – United States

President

Executive Vice President Corporate Services

Executive Vice President Western Business Management Unit

Vice President Information Technology

Vice President Food Services

Vice President Marketing

Vice President Finance and Administration

Director of Marketing

Director of Purchasing

Director of Information Technology

Senior Buyer

Corporate Chef

Business Analyst
APPENDIX B Questions for Qualitative Interviews

- Tell us about your role within the organization.

  ➢ What are you responsible for? Who do you report to? How long have you been with the organization?

  ➢ Please describe major decisions you make that are associated with your job responsibilities. What information do you have available to assist you with making these decisions? Do you receive the information when needed?

  ➢ What information do you wish you had and how often? What is the MAXIMUM time you would allow between request and receipt?

- What do you see as success for your department? What must you achieve in order to be successful?

  ➢ What information do you need to ensure that these critical success factors are under control? How often would you like to track these factors?

  ➢ Is there information that you need but don’t currently have access to?

- Please describe some major challenges that you were faced with in trying to meet your departmental/organizational goals?

  ➢ What information did you have available to you? Did you receive the information when needed?

  ➢ What information do you wish you had and how often? What is the MAXIMUM time you would allow between request and receipt?

- Tell us about the current reports you have access to (have a paper copy and go through them)
Do you automatically receive these reports or do you have to request these reports? If the former, how often do you get these? If the latter, from whom and how much time usually elapses between your request for the information and the actual receipt? Is this a sufficient or insufficient time frame?

How do you use these reports? What types of decision do you make based on these reports?

How useful or not useful are they for making decisions? What do you like and dislike? How would you rate the reliability of the information you receive?

In a perfect world with no limitations, tell us about the types of reports you need to make your decisions.

What type of decision would you use the information for? How often would you like to receive these reports? What kind of groupings/subtotals would you need?

What is the MAXIMUM time you would feel comfortable with between request and receipt?

How do you prefer getting your reports? (Request them from IT and get paper copies or generate and access them yourself)

On a scale of 1 to 10 (10 being the highest) how would you rate your access to the appropriate information for making decisions?
REFERENCES


