

## **CHAPTER 1 INTRODUCTION**

### **1.1. Background**

Organisations that manufacture products, which are physically distributed to customers and consumers by a third party distributor, are faced with a problem regarding the distribution data. The distribution data is captured by the third party distributor(s) during the distribution process and includes, for example, the invoiced transaction details, customer details, inventory levels and outstanding orders. Manufacturers need this data in order to optimise their distribution channels, to understand the demand in the marketplace, and to offer their customers better service by better understanding and responding to their requirements.

Third party distributor(s) will normally make this data available to the manufacturer. The manufacturer then has to meet its own management information requirements, that is, making this data internally accessible in order to support and optimise decision-making regarding sales and marketing, functions as well as other related business such as production. Manufacturers must determine how best to meet this management information need.

The need to use an information system to address this need is obvious: information systems “enable companies to share information regarding customers, production, inventory, and finance with their supply channel partners” with the result that “... all levels of management will be able to make effective decisions based on timely, global [i.e. integrated] information that adequately reflects the current state of the marketplace” (Ross, 1998:55). There are many mechanisms or information systems, which can be used to deliver management information in organisations. One possibility is the use of a data warehousing approach, in particular the use of data marts.

Data marts have been utilised with success by organisations in numerous industries, including the manufacturing sector and in many business functions, including sales and marketing. The aim of this study is to determine whether there are differences in the use of sales and marketing data marts as management information delivery mechanisms between manufacturing organisations in different industries with a particular focus on the pharmaceuticals and branded consumer products industries respectively.

### **1.2. Problem Statement, Demarcation and Methodology**

#### **1.2.1. Problem Statement**

The central problem statement of this study takes the form of a hypothesis that is tested by means of evidence presented. The hypothesis is that there is no significant difference in the use of sales and

marketing data marts as management information delivery mechanisms in manufacturing organisations in different industries, particularly the pharmaceuticals and branded consumer products.

In order to test the above hypothesis, a number of sub-problems need to be addressed, namely:

- The role of information in organisations' sales and marketing strategies, in particular management information;
- Data marts as management information delivery mechanisms;
- The use of data marts in manufacturing organisations with third party distribution in different industries together with a comparative analysis of the case studies presented.

The first two sub-problems justify further expansion in terms of the constituent research objectives. In order to determine the role of information in organisations' sales and marketing strategies, the following objectives must be met:

- To indicate the increasing significance of the role of customers and their data in organisations;
- To indicate the need for a single/integrated view of the customer;
- To indicate the vital role of sales and marketing strategies in organisations given the increasing significance of customers;
- To provide an overview of generic sales and marketing processes related to the development of sales and marketing strategies within an organisation;
- To explore generic management information requirements within the context of the organisational sales and marketing processes;
- To indicate the importance of external data sources to an organisation in meeting these management information requirements;
- To determine sources of data required given generic management information requirements within sales and marketing; and
- To explain the role of customer-facing firms with regard to gathering of customer data and the importance of forming channel partnerships as a method to assure organisations' access to data gathered by customer-facing firms.

In order to examine data marts as management information delivery mechanisms, the following objectives must be met:

- To compare and contrast the data warehouse and types of data marts in order to arrive at an understanding of what it is;
- To indicate the relationship between data warehouses and data marts;

- To describe, classify and characterise the access tools to data marts/data warehouses as management information delivery mechanisms;
- To define criteria to select the appropriate data mart access tool(s); and
- To explore the use of data warehouses and data marts in organisations, particularly within the context of sales and marketing, as discussed in literature.

### **1.2.2. Relevance of Study**

The research will examine the use of data marts, which is a specific type of information system, to deliver management information. Information systems are addressed in a number of disciplinary fields, the most relevant being: information science (specifically relevant are the areas of information organisation and retrieval, and information management), computer science (specifically software engineering, database design), and informatics (specifically systems analysis and design, and MIS or management information systems). Furthermore, the study examines the provision of management information in a specific context relating to transfer and use of data across the supply chain and is therefore also relevant to logistics, marketing and other management disciplines.

### **1.2.3. Research Methodology**

The methodology for this study is based on a review of literature and qualitative case study research, each of which is expanded upon below.

#### **1.2.3.1. Literature Study**

As a first step in the investigation of the use of data marts by manufacturing organisations using third party distribution, a literature study of the subject field will be conducted. This is important since it will help define key concepts, and lay a framework for the delineation and discussion of the case studies.

Literature from the following academic disciplines, which are closely linked to the relevant disciplines (see 1.2.2. ), is consulted:

- Computer Science with particular focus on Database Management Systems;
- Information Science;
- Informatics;
- Logistics Management with particular focus on Supply Chain Management; and
- Management Information Systems.

The literature study allows the following research objectives to be met:

- To determine the role of information in organisations' sales and marketing strategies, in particular management information; and
- To examine data marts as management information delivery mechanisms.

#### **1.2.3.2. Qualitative Case Study Research**

The empirical evidence is taken from actual sales and marketing data mart implementations in organisations and will be presented as case studies followed by a comparative analysis. Based on Cashman's (2000:49) opinion that organisations can "benchmark approach against other firms with similar circumstances and goals," the case studies can be used for comparative analysis; the case studies examine two organisations with very circumstances and goals but slightly different profiles with regard to size (small and medium), IT sophistication and resources, reasons for using data marts, industry, and the nature of their respective competitive environments. The case studies draw on a combination of personal observations (the author was a member of these data mart implementation project teams) and qualitative data from interview transcripts and responses to answer the stated research questions (see 1.2.1. ).

The use of qualitative case study research allows the following research objective to be met:

- To describe the use of data marts in manufacturing organisations with third party distribution in different industries.

Note that a condition for the use of these case studies is that the confidentiality of the particular organisations is protected.

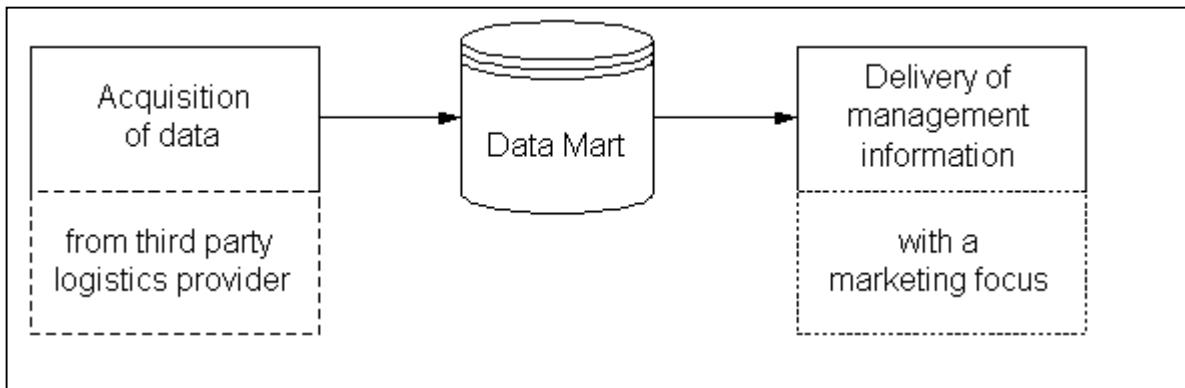
#### **1.2.4. Demarcation of Study**

In order to demarcate this study and clarify the scope, the following specific limitations are identified:

- The approaches to decision-making in organisations i.e., as a process, are not included in the study, but the information required to support decision-making is.
- The methodology followed to build a data warehouse or data mart is not included in the scope. Thus the detailed steps to gather business and/or user requirements are not covered although the business requirements in terms of management information are included in the case studies.
- There are other options for delivering management information within this context. The purpose of this dissertation is not to do a comparative analysis between these, thus the use of so-called portals or enterprise information portals (EIP), central digital exchanges or marketplaces, and data warehousing within a context of knowledge management are excluded.

- The technology, for example, electronic data interchange (EDI), TCP/IP, XML etc., used to physically transfer data is not included.

The scope of the study can be summarised as the examination of data acquisition from a third party logistics provider, the use of the data to populate a data mart and the subsequent delivery of management information with a sales and marketing focus to the intended user community. This is depicted schematically in Figure 1.



**Figure 1: Conceptual demarcation of study**

### **1.2.5. Assumptions**

The following theoretical assumption govern this study:

- It is assumed that the differences between the management information requirements attributed to the respective industries are not sufficiently different to impact the comparison of the use of data marts as delivery mechanisms of management information in order to test the hypothesis.

## **1.3. Terminology**

This section aims to clarify terminology used in the dissertation. It is not intended to be a complete definition but rather a working definition within the context of the research documented in this dissertation.

### **1.3.1.1. Management**

Management is characterised by the performance of functions within an organisational context: management is the act or art of managing, the conducting or supervising of something, for example an organisation. Management is also seen as the collective body of those who manage or direct an organisation.

### **1.3.1.2. Data and Information**

The question of definitions of data and information has been the subject of continuous debate in a number of disciplines, such as information science and philosophy, particularly with the recent interest in the concept of knowledge management. Although there are no unambiguous and commonly accepted definitions of data and information, many working definitions can be found in academic literature.

According to Turban and Frenzel (1992:10-11) “*data* refers to numeric or alphanumeric strings that by themselves do not have meaning. These can be facts or figures *to be processed*. *Information* is data organised so that it is meaningful to the person receiving it.” These definitions are made with computer science, particularly artificial intelligence, being the point of departure. Another view is that of Harris (1996:1) that “the lowest level of known facts is *data*. Data has no intrinsic meaning. It must be sorted, grouped, analysed and interpreted. When data is processed in this manner, it becomes information. *Information* has a substance and a purpose”

Although there are many possible definitions depending on one’s point of departure, the working definition accepted in this study is that information is processed data that imparts meaning to a receiver, i.e., the lowest level of known facts, such as numeric or alphanumeric strings, which has been processed, for example, sorted or grouped. As such information has the following characteristics (Butcher, 1998:91-95):

- Relevant (timely, accurate, precise, quality);
- Accessible;
- Complete and comprehensive; and
- In a suitable presentation and format.

### **1.3.1.3. Management Information**

The phrase management information implies a specific category or subset of information (or processed data) qualified by the use of the word ‘management’. Depending on the audience and purpose the main focus then of this qualifier can indicate either:

1. Information for management; or
2. Information to manage.

The first category implies that those in management use information in order to manage. The second category is broader in that it also encompasses roles beyond those formally considered management roles, which use information to perform management functions within their roles. O’Brien (1999) classifies management information (Figure 2) as supporting the organisation at progressively more focused levels:

- Support for business operations;
- Support for managerial decision-making; and
- Support for strategic advantage.

Support for business operations could be seen as the second broader category of information used to manage whereas support for managerial decision-making and strategic advantage is the more narrow information for management. Within the context of this research the working definition of *management information* is taken to be the latter, i.e. narrower category of information used by management.



**Figure 2: Use of management information in organisations (O'Brien, 1999)**

#### 1.3.1.4. Supply Chain and Supply Chain Management

The supply chain starts from the origin of the raw material and ends once the product has been discarded or recycled. In essence, the overall aim of the supply chain is to get the right product to the right place in the right quantity with the right quality at the right cost. Against this background the primary decisions made within the supply chain are related to:

- Sourcing, e.g., choice of suppliers;
- Production, e.g., product quality, plant capacity;
- Inventory, e.g., how much inventory to hold; and
- Logistics, e.g., distribution.

The main objectives of a supply chain include:

- Increased communication along all nodes of the supply chain to create an uninterrupted flow of materials;
- Decreased inventory while maintaining high customer service levels; and
- Reduced supplier base together with supplier relationships in order to reduce overall costs.

Supply chain management (SCM) then is, unlike management in a traditional organisation, “a collaborative effort among various organizations or entities whose well being relies on dependency relationships” (Green, 2001:208) within a supply chain. The focus of management in a supply chain is on the collaborative effort amongst many organisations in order to reach its stated objectives.

#### **1.3.1.5. Third Party Distribution**

The phrase third party distribution is a specific aspect of third party logistics, often shortened to 3PL. The term 3PL describes businesses that provide one or many of a variety of logistics-related services such as warehousing, transportation management, distribution management, and freight consolidation. A 3PL provider may take over all receiving, storage, value added, shipping, and transportation responsibilities on behalf of a manufacturer and either conduct them in the 3PL’s warehouse using its own equipment and employees or may manage one or all of these functions in the manufacturer’s facility using their equipment, or anything combination of the above. Thus third party distribution is the outsourcing of the distribution function to a 3PL.

### **1.4. Division of Chapters**

In Chapter 1 an introduction and overview of the research problem, literature on the topic, and methods of investigation will be discussed.

The role of information in organisations’ sales and marketing strategies is discussed in Chapter 2. First, the increasing significance of customers to organisations in the current marketplace is indicated, and second, the generic processes in the sales and marketing function of organisations are explored. Based on these processes, generic sales and marketing management information requirements are highlighted together with the corresponding data sources required to satisfy these needs. Last, the data required upstream by channel partners in a supply chain context is considered.

In order to explore data marts as management information delivery mechanisms in Chapter 3, data warehouses and data marts are defined and different types of data marts distinguished. The analytical tools used to access data marts, namely query and reporting, online analytical processing and data mining, are described, classified and characterised after which the evolutionary nature of use is discussed together with

the possible uses of data marts for sales and marketing purposes currently occurring in practice. The possible configurations for using data sourced externally, particularly from a 3PL for use by a manufacturer.

The use of data marts in manufacturing organisations with third party distribution is discussed in Chapter 4 by means of case studies in two manufacturing organisations in two industries, fast moving consumer goods (FMCG) and pharmaceuticals, respectively. The structure of the discussion of each these case studies is to provide an overview of the external environment in which the manufacturing organisation functions by means of industry-specific issues in order to contextualise the case study, an overview of the particular organisation, the internal environment, including the motivation for selecting a data mart as the choice of solution, the sales and marketing management information requirements; the data sources, both internal and external; and a qualitative assessment of the data mart solution in terms of the delivery of the required management information and the impact on the organisation by members of the user community.

The key qualitative results and findings of this study will be presented in the last chapter (Chapter 5) by means of a comparative analysis of the case studies discussed in the previous chapter. The findings will be summarised and evaluated against the original problem statement and research objectives. The chapter concludes with suggestions for further research.