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إستراتيجيات الأعمال في مواجهة تحديات العولمة

The role of Marketing Information System in decision-making: A conceptual framework

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# THE ROLE OF MARKETING INFORMATION SYSTEM IN DECISION MAKING: A CONCEPTUAL FRAMEWORK

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## **Abstract**

This study intends to highlight the significance and importance of using MKIS in decision-making, as well as to describe the process of decisions taken by the managers using MKIS. The study also aims to lay out the necessary requirements for the successful implementation of MKIS in decision-making. The review of literature shows that the roles for computer-based support for developing marketing strategy present a real challenge to individual computer-based techniques and technologies in a fast-changing environment. A single support technique cannot meet the broad requirements of the new roles, and can only fit some of them. Each technique has specific benefits that make it suited to certain problems but not to others. While individual intelligent techniques have particular strengths, they also have specific weaknesses. These weaknesses raise the need for developing a hybrid intelligent system, where two or more techniques or technologies are combined to overcome or reduce the weaknesses of individual techniques or technologies.

## **Introduction:**

Successful business strategies and operations depend on successful decision-making. Marketing strategies are the means by which the company's marketing objectives will be achieved (McDonald, 1996)<sup>1</sup>. Marketing strategy development is concerned with devising the means by which the company can effectively differentiate itself from its competition, by capitalizing on its strengths to provide better value to its customers over time. The purpose of marketing strategy development is to establish, build, defend, and maintain competitive advantage (McDonald, 1992)<sup>2</sup>. The development of marketing strategy requires both comprehensive analysis of internal and external environments and a synthesis of useful information (Mintzberg, 1994a)<sup>3</sup>. It requires managers to deal with issues that involved a high degree of uncertainty and ambiguity (Brownlie and Spender, 1995)<sup>4</sup>. It also involves managers' intuition and judgment (Mintzberg, 1994a).<sup>5</sup>

The ultimate purpose of MKIS is to facilitate managers mission to make decision at all levels of operations based upon the information flow. Information is the essential ingredient of management and decision-making for both external and internal factors. Higher level of management is concerned with external factors such as new and proposed government legislation, changes in the market, Economic Status, competitors actions, etc. At lower levels, external influences are considered less important. A value of information can be computed for decisions, which fits these frameworks of analysis.<sup>6</sup>

Marketing strategy development needs much experience and extensive domain knowledge (McDonald and Wilson, 1990)<sup>7</sup>. Systematic analysis and strategic thinking are essential to the formulation of sound strategy. In recent years, the use of computer-based

information systems in developing marketing strategy has gained attention from academic researchers. Decision support systems (DSSs) have been developed to assist with the formulation of marketing strategy using quantitative models and analytical techniques (Wilson and McDonald, 1994; Belardo et al., 1994)<sup>8</sup>. Efforts have also been made to apply expert systems (ESs) in supporting strategic marketing by offering domain knowledge and intelligent advice (McDonald, 1989a)<sup>9</sup>.

The decision is the point at which plans, policies and objectives are translated into concrete actions. Planning leads to sound decision-making and that implies the selection from alternatives course of actions. Decision-making is the core of planning, for instance, choosing of objectives, policies, procedures, programmes, rules, strategies and tactics etc., require the entire process of decision-making. Therefore, the quality of marketing management decision is linked with the quality, quantity, adequacy and speedy availability of data.<sup>10</sup> The purpose of decision making as well as a planning is to direct human behaviour and effort towards future objectives. In the entire process of marketing activities, making decisions is always essential.<sup>11</sup> Managerial function is exercised through decision-making. Decision-making spreads through all elements of marketing management. e.g., production, marketing, finance, personnel, administration. Whatever marketing managers do, he do it through a decision making after considering thoroughly the available alternative course of action.<sup>12</sup>

Generally, development of marketing strategy is difficult and complex. They require both systematic analysis and a synthesis of relevant information. They are usually dealt with by experience and judgment, often in a fast-changing environment. Information and problems solving knowledge, when available, is usually incomplete (McDonald, 1996)<sup>13</sup>. Most previous research seems to have assumed that strategy can be created through the use of effective computer based systems, this could suggest some lack of deep understanding by researchers about the nature of marketing strategy development and how it can be more effectively supported. Decision making always involves risk since it is concerned with assessment of future revenues, costs, outcomes and events, none of which can be known. Information reduces uncertainly and helps marketing manager to see the likely effects of various decisions but the information system does not make the actual decisions – that is a MKIS function. The function of MKIS is to provide decision makers with timely and accurate data to allow making and implementing the necessary decisions to optimise the interrelationships of men, materials, machines, and money to most effectively reach the organizations predetermined goals.

The research focus on highlighting the elements of MKIS, and why MKIS is important to decision makers? Moreover, the purpose of the current study is to:-

- Present an overview of the components of MKIS as well as Decision Making.
- Describe the process of MKIS and Decision Making.
- Outline the necessary requirement for the successful decision making by implementing the MKIS.

## **Marketing Information System-A conceptual Approach**

Market information includes all facts, estimates, opinions and other information used in marketing decisions, which affects the marketing of goods<sup>14</sup>. Goods are produced or purchased for resale in anticipation of demand. Therefore, the success of a producer or a merchant depends upon the knowledge of the demands of his product or products in the market. In the modern method of marketing it is necessary for a manufacturer to possess accurate information on the following points: What goods do consumers want? At what time do they want them? In what quantity is a product wanted? How the product of the consumers wants a particular product? How the product can be made available to the consumers? How many new customers can be attracted to purchase a product and how? Whether there is any competition already in the market.<sup>15</sup>

Accurate information about the market may help in sound sales forecast and to plan buying policies on the basis of such sales forecast. If risk is minimized, solution of the problem of market financing is made easier. Smaller amount of capital would be required for stocks, expenses of selling may be reduced and loans can be optioned and credit extended more freely. Further, accurate market information may be helpful in price-stabilization because with the correct knowledge of demand, production may be so planned that the equilibrium of demand and supply is least disturbed. Thus, market information help a manufacturer to create, retain and expand the market for his products.<sup>16</sup>

Brien defined MKIS as “A structured, interacting complex of persons, machines and procedures designed to generate an orderly flow of pertinent information collected from both intra and extra-firm sources for use as the bases for decision making in specific responsibility areas of marketing management.”<sup>17</sup>

Philip Kotler (2002) define MKIS as: “A marketing information system is a continuing and interacting structure of people, equipment and procedures designed to gather, sort, analyze, evaluate and distribute pertinent, timely and accurate information for use by marketing decision makers to improve their marketing planning, execution and control.”<sup>18</sup> Kotler suggests that the organization ‘should design the marketing information system in a way that reconciles what executives would like to have, what executives really need and what is economically feasible to offer, with the information being precisely related to the major decisions which marketing manager have to make – the decisions concerning the product, place, price and promotional aspects of market performance. He therefore, proposes that the system design should be based on a survey of user needs, covering such issues as: types of decisions being taken; types of information needed to make the decisions; types of information presently being supplied regularly; types of information which would be liked but which are not yet supplied; types of special studies being periodically requested; types of information required daily, weekly, monthly, yearly; types of magazines, trade reports required regularly; types of special, topic on which information is thought useful; types of data analysis programs to be made available.<sup>19</sup>

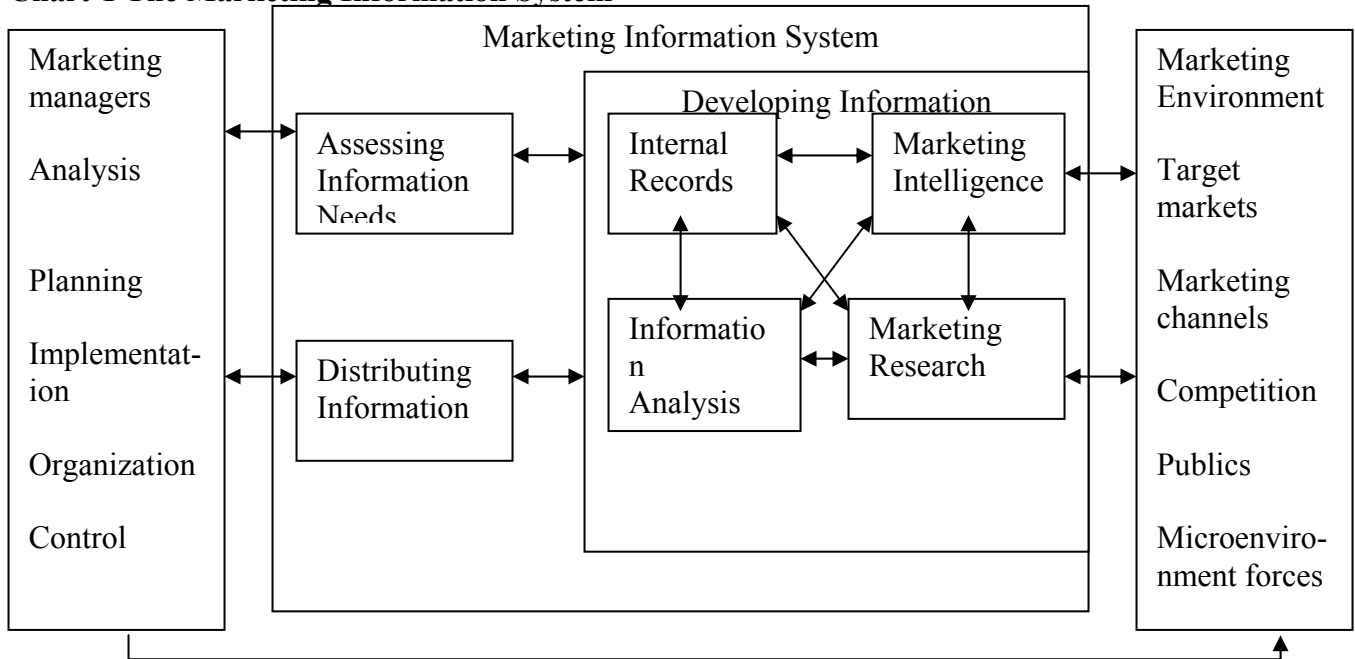
From the above discussion, we can see that MKIS is more comprehensive than marketing research. Berenson state that, “A marketing information system involves broader and more inclusive activity than marketing research. It includes: (I)“determining specifying the data needed, (II) the generation of this information by means of marketing research; distribution cost, analysis, or some other tool, and then (III) processing of these data.

Marketing intelligence suggests a process, while marketing research is often concerned with techniques.”<sup>20</sup>

According to Stanton, “marketing intelligence is a system concept, whereas marketing research usually deals with fragmented, unrelated research projects, done to solve an existing problem identified by some executive. Thus, a marketing system is conducted on continuing basis serving as a prognosis as well as diagnosis; it is preventive as well as curative medicine for marketing.”<sup>21</sup> Jutkins(1994)<sup>22</sup> defined database marketing as gathering, saving and using maximum amount of useful knowledge about your customers and prospects ... to their benefit and your profit. According to American Heritage Dictionary (1995) database is a collection of data arranged for computer retrieval.<sup>23</sup>

The marketing-information-system concept is illustrated in chart-1. The marketing managers, in order to carry out analysis, planning, implementation and control responsibilities (shown at the left), need information about developments in the marketing environment (shown at the far right). The role of the MKIS is to assess the manager’s information needs, develop the needed information, distribute the information in a timely fashion to marketing managers.<sup>24</sup> In the words of Adere Lee “A marketing information system or a marketing intelligence system are defined as an interacting, continuing, future-oriented structure of people, equipment and procedure designed to generate and process an information flow which can aid business executives in the management of their marketing programs.”<sup>25</sup>

**Chart-1 The Marketing Information System**



Source: Kotler, Philip & Gary, Armstrong, (principles of Marketing), Prentice-Hall, N.J., 2003, p132.

**Role of computer in marketing operations:**

The main role of computer in marketing operations are summarized as follows: forecasting, planning, control, modeling, systems analysis and facilities offered by the data base.<sup>26</sup>

**Forecasting:**

Computer can perform such historical analysis as below speedily which may be difficult or even impossible manually.

(I). Data smoothing by means of moving averages or weighted, moving averages (including exponent smoothing) to disentangle the underlying trend from amidst irregularities.

(II). Seasonal analysis, economic activity varies with seasons, viz. sales of ice cream. The seasonal analysis can be used to compute the seasonal indices.

(III). Cyclical Analysis. Cycle of booms and depressions can be discerned factoring an economic time series into trend, seasonal, cyclical and error components.

(IV). Correlation and regression analysis. Such relationship at the variance of sales is proportional to the mean sales etc. can be discovered. Multiple regression analysis involves a great deal of calculation and computer would be particularly useful here.

(V). Auto-correlation analysis. There are some variables that have a time delay relationship, viz. sales of repair parts in a period is a function of the sales in the preceding period. Such relationships can be established.

(VI). Data description. Various frequency distributions can be tried for a fit in the given data later; the goodness of the fit tests can be performed. Such summary statistics as mean, mode, median, SD, MAD, skewness, can be computed to describe the given data.

(VII). Optimal parameters of the selected forecasting model can be derived: for example, in simple exponential smoothing model what value of the smoothing coefficient to use? Different values are tried on the historical data and the one that yields the least cumulative-squared error is selected for implementation.

### **Planning:**

(A). Planning can be done more frequently and even continuously. Because of constraints of computational and data processing abilities in manual systems, it used to be the practice to set reorder level annually. Important demand fluctuations were thus ignored resulting in higher stocks and poorer service than is possible now in computerized systems where reorder levels can be revised much more frequently. Eilon reports 40% savings in stock holding for the same service by periodically revising reorder levels on the basis of his extensive simulation experimentation.

(B). Sophisticated models for planning can be employed for example, linear programming, etc. can be used for production planning. In particular, project planning and control (both physical and cost-wise) and resource allocation can be excellently carried out by means of OPM/PERT on the computer.

(C). Simulation can speed up evaluation of alternative plans. Simulation is a method reproducing the major elements of a dynamic situation within the foreshorten time available through programming a computer. Thus, instead of waiting for 2 years to see the result of a capital investment project, the 2-year's experience may be simulated on the computer.

### **Control:**

(A). More comprehensive, varied, accurate and frequent reports can be produced when necessary.

(B). Statistical quality control techniques can be used to monitor marketing and financial ratios.

(C). Variance analysis plus other analyses which might assist in understanding both the reasons for variances and also the courses of action that will be corrective can be undertaken.

### Modeling:

Modeling can be tested for robustness or in conglomeration against historical or hypothesized data by simulation or otherwise. Sensitivity analysis can be performed to see to what extent the input variable affect the output variables. Computers can also assist in model building to sort out relationships.

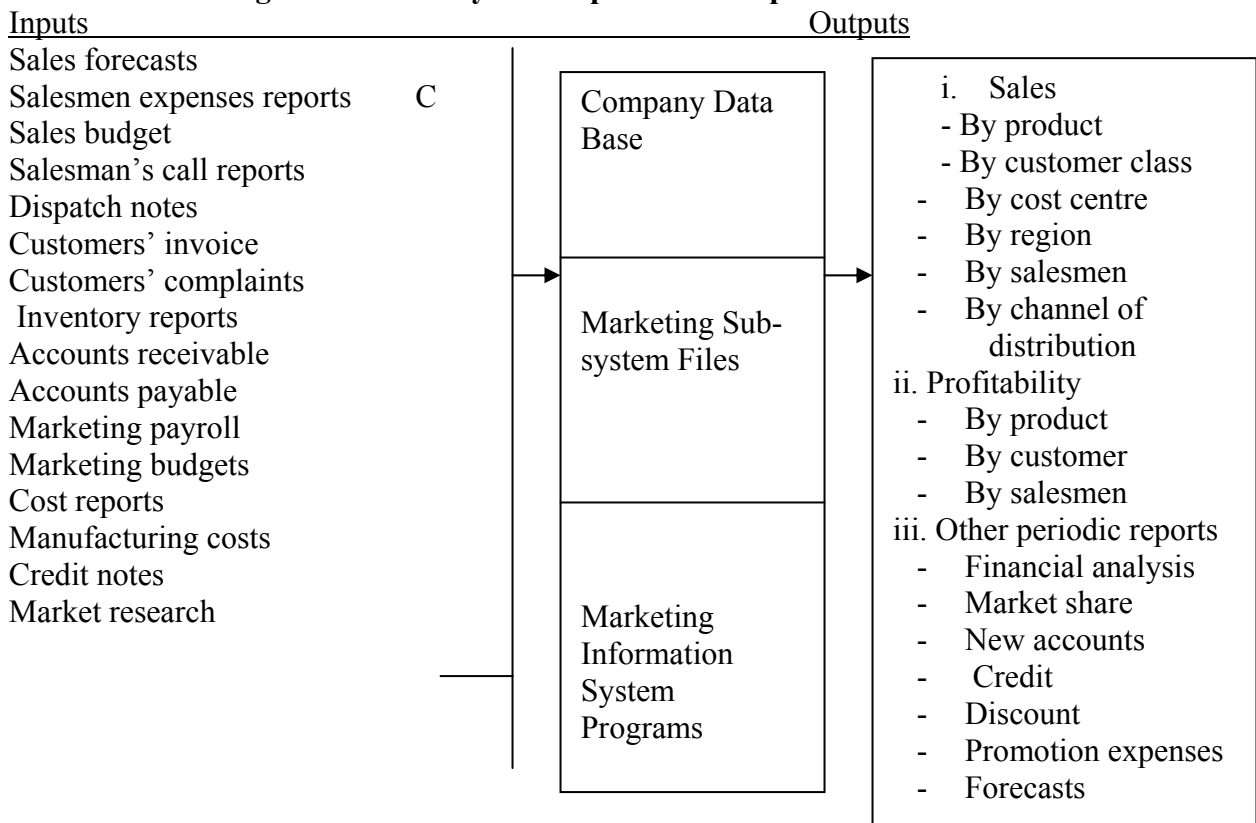
### System Analysis:

Several alternative MKIS designs can be evaluated by means of simulation experimentation.

### Data Base Facility:

Data is no longer vivisected department wise. All planner, forecaster, supervisor, system analyst and modelers can discharge their functions much better.

### Chart-2 Marketing Information System Inputs and Outputs:<sup>27</sup>



Source: James A. OBrien. , "MIS", GALGOTIA PUBLICATIONS Ltd, N.D, 1998,P.19

### An Overview of Decision-Making

Decision-making is a conscious human process. The verbs 'decide' is derived from the Latin Prefix 'de' meaning 'off' and the word 'caedo' meaning 'to cut'. In this sense, some cognitive process cuts off as preferred, or selects, a particular course of action from among a set of possible alternatives. To decide means to come to a conclusion or resolution. Shull<sup>28</sup> and others have defined decision-making as the "conscious and human process, involving both individual and social phenomenon based upon factual and value premises, which concludes with a choice of one behavioural activity from among one or more alternatives with the intention of moving toward some desired state of affairs". It represents a course of behaviour or action about what must or must not be done. Three

aspects of human behaviour are involved in decision making: (i) cognition, activities of the mind associated with knowledge; (ii) the action of the mind implied by such words as willing, desire, and a version, and (iii) the aspect of mind associated with emotion, feeling, mood and temperament. All these factors go into decision-making. Thus, decision-making is defined as the selection of the one course of action. It is a choice making activity and the choice determines our action or in action.

Decision-making is the art of determining in one's mind upon an opinion or course of action. According to Clough:<sup>29</sup> "the decision-making process involves a problem to be solved, a number of conflicting objectives to be reconciled, a number of possible alternative course of action from which the 'best' has to be chosen and some ways of measuring the value or payoff of alternative courses of action". Thus, the author emphasis that decision-making is the selecting of action from among alternatives to achieve a specific objective or solve specific problem.

Simon<sup>30</sup> 1977, says that "Management and decision-making are the same thing" Decision-making begins with the recognition of problem, and once it is recognized and defined, alternatives to change the unfavourable situation into a more favourable one are sought. Decision-making is globally thought to be "selection from alternatives." If is deeply related with all the traditional functions of manager, such as planning, organizing, staffing, directing and controlling. When he performs these functions, he makes decisions. However, the traditional management theorists did not pay much attention to decision-making.

### **Theories of Decision-making**<sup>31</sup>

The art of decision-making provide us a variety of approaches, methods and techniques helpful and useful for making high quality of decision. A decision maker, as an individual, or as a member of formal organization with his own philosophy and perception of the organization, selects for optimising values within the constraints imposed by the organization. Some of these theories are as under: -<sup>32</sup>

#### **1. Probability theory**

Probability is defined as relative frequency. The role played by it in decision-making is that of a substitute for certainty. In an organizational problem where possibility can be substituted for unknowns, the margin of error in the solution is limited.

#### **2. Queuing theory**

Queuing models are used to provide service facilities. It is used to balance the cost of waiting lines verses the cost of preventing waiting lines by increased service. The objective is to minimize the combined cost of queuing delay and service facilities.

#### **3. Liner Programming**

This technique is used in finding the solution for optimising an objective function under certain constraints. The technique is concerned with optimum allocation of limited resources for optimising a given function.

#### **4. Game Theory**

Game theory is used to determine optimum strategy in a competitive situation, in real life; many business situations involve several competitors, each trying to make use of mathematical techniques combined with logical thinking to evolve the best possible strategy that can beat his competitors.

#### **5. Simulation**

In simulation a series of random numbers are generated and stored by a computer. It is a quantitative technique used for evaluating alternative courses of action based upon facts and assumptions with a computerized mathematical model in order to represent actual decision-making under conditions of uncertainty.

#### **6. Search theory**

This theory concerns itself with search problems. The problem is characterized by the need for designing a procedure to collect information on the basis of which one or more decisions are made. The theory is useful in places in which some events are known to occur but the exact location is not known.

#### **7. Mathematical Decision Theory**

It is not designed to show decisions are actually made. Rather, it is design to help the decision maker who is interested in maximising profit in a given situation, to lie out the alternatives in such a way that he sees the risks and the consequences more clearly. With the development of operations research and computers for handling complex mathematical models, this approach is commonly used by large organizations where decision-making problem is very complex.<sup>33</sup>

#### **8. Heuristic Programming**

This technique refers to step-by-step search towards an optimum solution when a problem cannot be expressed in mathematical programming form. The method examines successively a series of combinations that lead to stepwise improvement in the solution and the search stops when a near optimum has been found.

#### **9. Value Theory**

This theory is considered as a cost reduction technique, which account for a major portion of total cost in most industries by a scientific approach and analysis.

#### **10. Information Theory**

This theory is an attempt to formulate a mathematical model for evaluation of information flow within the given organization system.

### **Types of decision**

There are different types of decision. According to Drucker, there are four basic criteria, which determine the nature of decision and the level of authority that should be decided: There are (i) future times involved; (ii) the qualitative factors; (iii) whether a decision is rare or routine and repetitive; (iv) whether the impact of a decision is on other functions, areas or on the businessman as a whole.<sup>34</sup> Decisions are typically characterized as unstructured, semi-structured and structured.

#### **Unstructured Decisions**

The unstructured decision involves decision situations where it is not possible or desirable to specify in advance most of the decision procedures to follow. Many decision situations in the real world are unstructured because they are subjected to too many random or changeable events or involve too many unknown factors or relationships.<sup>35</sup> It occurs when the relevant parameters as well as the influencing relationships are unknown. The manager does not know the information required. The information system can be of no help to the manager under this type of situation. For unstructured decisions cost system, sales and production R&D planning etc., techniques can be used.

#### **Semi Structured Decisions**

Semi-structured decisions occur in an environment where the relevant parameters are mostly known and where influencing relationships are suspected or are approximately

known. In such cases the MIS can provide assistance to the decision maker through provision of information. For semi-structured decisions, e.g., production, scheduling, cash management, overall budget, new product planning, etc., techniques can be used.

### **Structured Decisions**

Structured decisions involve situations where the procedures to follow when a decision is needed can be specified in advance.<sup>36</sup> Structured decisions are those where both the relevant parameters and relationships are known. Any decision process that can be defined in a procedure and issued to any organization is an example of structured process. For example account receivable inventory control, the reorder point; determination of the economic order quantity, short-term budgeting and the safety stock and stock are structure decision system provides analyses of determination to assist in decision-making. The structured decisions can be automated and can be computerized. The objectives of an MIS is to ensure that all the structured decisions are computer generated and the managers need not spend much time in making structured decisions.

### **Programmed Decisions**

Programmed decisions are applied to structured or routine repetitive problems and for which decision rules and standing procedures can be devised.<sup>37</sup> Programmed decision may involve considerable amounts of money so care must be taken to ensure that procedure are appropriate. A typical programmed decision is stock re-ordering with calculated reorder levels and reorder quantitative or reordering of standard inventory item represents programmed decisions based on standard inventory models. Now a day the programmed decisions are made through management information systems particularly where the information system is computer based.

Programmed decisions are decisions that can be pre-specified by a set of rules or decision procedures. Programmed decisions can presumably be handled by a computer program since the rules for arriving at a decision are completely defined and only the values of variables must wait for the specific problem. In addition to a computer program, other examples of methods for implementing programmed decision are decision rulebooks, decision tables, and regulation. These programmed decision methods imply a closed decision model because all outcomes and consequences must be known.<sup>38</sup>

### **Non-programmed Decisions**

Non-programmed decisions are used for unstructured, unique, ill-defined situations of a non-recurring nature. They are non-repetitive decision often with high levels of risk where many factors from inside and outside the organization have to be considered. They are handling by general problem solving processes. They involve judgement, intuition and creativity. They are made by trained and higher level manager. Non-programmed decisions are one-time or recurring decisions that which change each time they are required. Decisions in open decision system are non-programmed.<sup>39</sup>

### **Relationship between Programmed and Non-Programmed Decision-making**

Programs are simply a string of instructions to accomplish an assignment. The concept of programmed decisions is important because the ultimate goal of information systems is to provide purely programmed decision. If this is not possible, we seek to provide the optimum type of information to the human decision-maker, who than makes non-programmed decisions. Decisions are non-programmed if they are unstructured, of high

consequences or complex or involve major commitments. Decisions that cannot be automated are also called non-programmed decisions. One of the goals then of MIS design is to device decision rules for the problems that lend themselves to solution by decision rules and the programmed approach.

In order to develop effective programmed decision, the decision maker must develop a set of decision rules. For example, if MIS is used for inventory control, the re-ordering of item can be programmed. Since the MIS keeps complete a accounting of inventory levels of any given item, a decision rule could be devised such that computer will recommend re-ordering as soon as the inventory level falls below X units (reorder point). The Economic Order Quantity (EOQ) and re-order point can be determined by analyzing the inventory environment and constructing an inventory model to replicate the decision situation. Another example of programmed decision is one of blending various food or chemical ingredients to produce amounts of outputs to meet demands subject to input resources availabilities. A linear programming model can be used to implement these decisions.

### **Programmed and Non-Programmed Decision-making Chart**

The useful and well know model proposed by Herbert A Simon will be used as the basis for describing the decision making process. Every decision is outcome of a dynamic process, which is influenced by multiple forces. This process is presented in chart 3.

**Chart 3: Programmed & Non-Programmed Decisions**

Classification of Decision	Decision-Making	
	Old	New
Programmed Repetitive and Routine	Habit Standard operating Procedure Organization Structure Policy Etc....	Management Information System (Including Management Science Techniques and The Computer)
Non-Programmed One-shot, ill-structured	Judgment, intuition, Insight Experience Training and Learning	Systematic approach to Problem solving & Decision-making

**Source:** Murdick, R.G. Ross J.E. and Glaggett J.R., “Information Systems for Modern Management”, Prentice Hall of India Private Limited, N. D, 1995, p.190.

### **Strategic Decision**

A strategic decision is one which is made during a current time but whose primary effect will be felt during some future time. Strategic decisions affect organizational structure and objectives. Strategic decision cannot be delegated lower than a particular level.<sup>40</sup>

### **Tactical Decision**

Tactical decisions are tactical in nature and called routine decision. They are important repetitive need little thoughts with few alternatives. The decision are taken up by middle and first line managers and do not involve any higher risk or uncertainty. Tactical decisions support and compliment organizational strategy. The tactical decision may be delegated to lower levels in the organization. Moreover, what might be strategies decision for one organization may be tactical decision for another?<sup>41</sup>

### Organizational Decisions

When a manager acts formally in his expected role in an organization, he makes unorganizational decision, which becomes the organization's official decision. Organizational decision reflects company's policies and programmes. They can be delegated to others.<sup>42</sup>

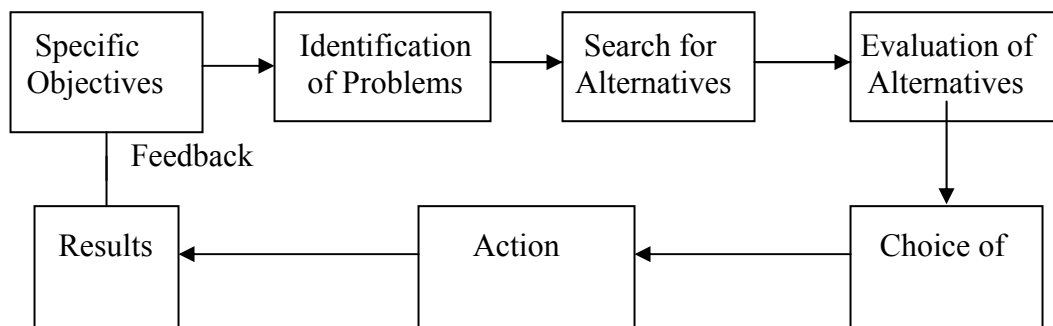
### Personal Decision

Personal decisions are made by an executive as an individual and not as a part of the organization. For example, a manager who decides to change his job is making a personal decision. Such a decision does not result in any form of organizational behaviour by others, however, it may affect the organization, but the organization will have to search a replacement for him. Sometimes, it becomes difficult to distinguish between persons and organizational decision. A manager can take a more objective decision when he is convinced that he is talking an organizational decision that which might differ from his personal beliefs. For example, in selecting a salesman for a particular area, the executive may personally feel that local considerations should not weight the decision but from the point of view of organizational effectiveness, he may decide to give weight age to the local people. These decisions cannot be delegated.<sup>43</sup>

### Decision Making Process

Decision-Making process should not be interpreted to mean that decision-making is a fixed procedure. A process is a dynamic concept rather than static. Events and relationships are dynamic, continuous, and flexible and must be considered as a whole in which many forces interact; a force affecting others and being affected by others. Therefore, the decision-making process should be seen as sequential process rather than a series of steps to enable decision maker to examine each element in the progression that leads to a decision. Moreover, the process reveals that it is more applicable to non-programmed decisions than to program ones. Problems that occur in frequently, are unstructured, and are characterized by a great deal of uncertainty regarding their outcome, require the manager to utilize the entire process. For frequently occurring, structured problems, it is not necessary to consider the entire process.<sup>44</sup> The following Chart shows the decision-Making Process.

**Chart-4 Decision-Making Process**



Source: Prasad L.M., “Principles and Practice of Management”, Sultan Chand & Sons, N.D, 1997, p. 210.

### **1. Understanding the background of Specific Objective**

Every action of marketing manager should be goal directed to achieve certain specific objective of the organization. Since the objective setting is an outcome of earlier decision, this may not be considered truly as the first step of decision process but concerned with understanding the circumstances surrounding the public to what past action and decision affect the current situation? What objectives and policies impinge as the current decision? What are the key elements in which background that which relate to the public? What is required is intelligent selecting so that relevant background factors are guided with?

### **2. Problem Identification**

Since a particular decision is made in the context of certain given objective. Identification of problem is the real beginning of decision-making process.<sup>45</sup> A problem is a felt need, a question thrown forward for solution. It is the gap between present and desired state of affairs on the subject matter of decision. Further in management, a problem exist whenever one faces a question whose answer involves doubt and uncertainty, if there is no solution to the problem, it cannot be treated as problem from decision point of view, through the consequences of not solving this problem may be terrible. A problem can be identified much clearly, if managers go through diagnosis and analysis of the problem. The recognition of what is the real problem requires much questioning and thought. For example, a firm is experiencing a drop in sales. What is the problem? Is it the price of the product, the quality, appearance, style, and capability? Is it poor sales and marketing? Is it the lack of advertising or of the right style of advertising, it is the lack of an appropriate incentive scheme for the sales force? Is it the appearance on the market of a superior, competing production? Have the consumers' tastes changes? Etc.

### **3. Search for Alternatives**

A problem can be solved in several ways all the ways cannot be equally satisfying. If there is only one way of solving a problem, no question of decision arises. Therefore, the decision maker must try to find out the various alternatives available in order to get the most satisfactory result of a decision. Identification of various alternatives only not serves the purpose of selecting the satisfactory one, but it also avoids bottlenecks in operation, as alternatives are available if a particular decision goes wrong. A decision maker can use several sources for identifying alternatives: his own past experience, practices followed by other, and using creative techniques. Typical of these are model building and solution, probabilistic analysis, decision trees, cost/volume/profit analysis etc.

### **4. Evaluation of Alternatives**

After the various alternatives are identified, the next step is to evaluate them and select the one that will meet the choice criteria. However, all alternatives available for decision-making will not be taken for detailed evaluation because of the obvious limitations of managers in evaluating all alternatives. Evaluation of various alternatives dissects on alternatives into various tangible and intangible factors. Tangible factors are those which can be quantified because they are quite obvious like the cost per unit, investment required, output to be received etc. as against these, intangible factors are mostly

qualitative and cannot be measured in terms of quantify. At this stage, the judgment and preferences of the decision maker are of importance. Frequently an optimum solution calculated by a mathematical technique may not be selected by the decision maker because of its impact on the organization and some non-optimum but still satisfactory solution would be selected instead. This type of behaviour Known as satisficing appears to be common among decision makers.

### **5. Choice of Alternative**

In this phase, the person taking the decision selects a particular course of action from those identified in the previous phase or rejects all the alternatives and thus the decision process may be back to the design or intelligence phase.<sup>46</sup> Marketing Management information system is most effective if the results of design are presented in a decision-impelling format. When the choice is made, the role of the MKIS changes to the collection of data for later feedback and assessment.<sup>47</sup> In choosing an alternative, the decision maker can go through three approaches experiences, experimentation, and research.

### **6. Action**

Once a decision is taken, its implementation follows: a decision, which is not implemented within a timeframe, is no decision unless it has been superseded, before its implementation, by another decision not to implement it. Most jobs done in an organization involve implementation of decision and should result in performance, achievement of expected results. The basis requirements for any action are: decision-stored data-work procedure and action information. However, action, whether highly structured or less structured should have a perceptible and tangible outcome. Information that goes into the action process is referred to as 'action information' and is necessarily a part of 'management information'.

### **7. Results**

When the decision is put into action, it brings certain results. These results must correspond with objectives, the starting point of decision process, if good decision has been made and implemented properly, thus results provide indication whether decision-making and its implementation is proper. Therefore, marketing managers should take up a follow-up action in the light of feedback received from the results. If there is any deviation between objectives and results, this should be analysed and factors responsible for this deviation should be located. Therefore, a successful marketing manager is one who keeps a close look at the objectives and results of the decision and modifies his decision according to the change in the circumstances.

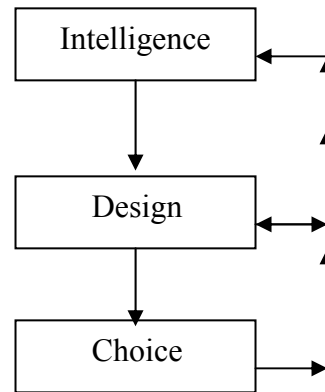
#### **Information Requirement for Decision Making**

Simon<sup>48</sup> has identified following three stages in decision-making:

- (i) Intelligence actives concerned with scanning the environment to identify events and conditions requiring decisions. The MKIS should contain decisions models to process data and generate alternative solutions. The models should assist in analyzing the alternatives.
- (ii) Design phase to develop analyse and evaluate alternative courses of action. This involves processes to understand the problem, to generate solutions, and to test solutions for feasibility.

(iii)Choice implementation activities to select an alternative as appropriate course of action from amongst the available alternatives and implementing and monitoring the alternative selected. The meaning of each phase is summarized in the following chart.<sup>49</sup>

1. Intelligence consists of searching the environment for conditions calling for decisions; it is synonymous with problem recognition.
2. Design is inventing, developing, and analysing possible courses of action.
3. Choice involves selecting a course of action and implementing it.



**Source:** Gordon B. Davis, “ conceptual foundations, structure and development”, international student edition, Sydney, 1974,pp, 144-145

**Decision Support System**

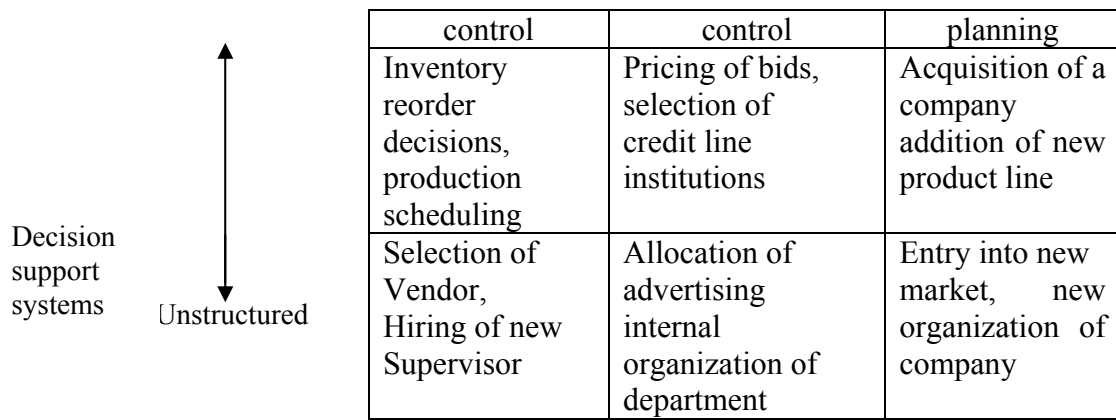
A decision support system (DSS) is an interactive computer system that is easily accessible to, and operated by noncomputer specialists to assist them in planning and decision-making functions. While DSSs may differ in their emphases on data-access and modeling functions, there is an overriding emphasis in all such systems on user accessibility to data for decision-making.<sup>50</sup> This decision-making applicability permits managers to simulate problems using formal mathematical models and to test the outcomes of various alternatives for reaching the best possible decision.<sup>51</sup> The term decision support system refers to a class of systems, which support the process of making decision DSS allow the decision maker to retrieve data and test alternative solutions during the process of problem solving. The meaning of DSS is based on following assumptions about the role of the computer in effective decision-making:

1. The DSS must provide ease of access to the database containing relevant data and interactive testing of solution.
2. The computer must support the manager but not replace his judgment. It should therefore neither try to provide the answers nor impose a predefined sequence of analysis.
3. The main advantage of computer support is for semi-structured problems, where parts of the analysis can be systematized for the computer, but where the decision makers’ insight and judgment are needed to control and process.
4. Effective problem solving is interactive and is enhanced by a dialog between the user and the system.

The application of DSS to different types of decisions is shown in Figure 1 DSS represent a different approach to information system support for semi-structured and unstructured decision. The approach is not to find a structure and automate it; rather it is to support to variety of unstructured decision process. The choice of DSS is based on the degree of action implication of system outputs that is the degree to which the system output can directly determine the decisions.

**Figure 1: Application of decision support systems to different types of decisions.**

		<b>Marketing Management activity</b>		
		Operational	Management	Strategic
Structured decision systems	Structured			



### Relationship Between DSS and MKIS

Since DSS is an outgrowth of the MKIS, there are basic similarities between them. They are both computer-based and designed to supply information to marketing managers.<sup>52</sup> However, there are some important advantages to a DSS. First of all, a DSS is geared to information manipulation and not essentially to data storage and retrieval, as are many MKISs<sup>53</sup> A DSS is operated directly by its users; when they need access to information, they can immediately consult their own on-line system without having to wait days or week for result from the MKIS department. Once manager call up the required data through a DSS, they can manipulate it directly, asking questions and reformatting the data to meet their specific needs without having to explain what they want to the EDP/MKIS staff.<sup>54</sup> Managers can thus be certain that they will get the information they need when they need it. In addition, direct manipulation of data has the advantage of greater security for sensitive information.

MKIS emphasizes standard, periodical reports and cannot respond well to non-routine, unstructured, or adhoc situation. MKIS departments may be unfamiliar with the decisions made in such situations; because they often have a tremendous backlog of requests for data they may be unable to respond quickly to additional special requests. Conversely, some managers who have no difficulty manipulating the data. DSS helps marketing managers make non-routine decisions in unstructured situations.<sup>55</sup>

Most previous work has focused on incorporating the latest techniques and technologies, often giving much less attention to whether these support systems are actually compatible with managers' needs; there has been little consideration of how to take advantage of managers' strengths and compensate for their weaknesses (Mintzberg, 1994a).<sup>56</sup> Previous research has paid very little attention to the importance of managers' judgment, and how to couple it with strategic analysis. Each specific technique or technology employed has its own particular strengths and weaknesses that make it suitable for some situations and not effective for others (Duan and Burrell, 1995)<sup>57</sup>. A single support technique often fails precisely to fit the decision-making parameters, and to meet the wide range of information, modeling and conceptual needs of marketing strategy formulation. Any particular strategic analysis model used has its own advantages and limitations. A single strategic analysis model is sometimes difficult to adapt to specific circumstances, and can only illuminate part of the strategic landscape. No one tool on its own is adequate in dealing with the complexity of marketing (McDonald, 1992).<sup>58</sup>

Although marketing strategy development involves a high degree of uncertainty and ambiguity, previous support systems seem to have done very little in helping managers deal with uncertainty in developing marketing strategy. A large-scale mail questionnaire survey conducted by Li (Li, 1998)<sup>59</sup> found that, of the 104 responding marketing directors and managing directors in the UK large companies, most are very dissatisfied or dissatisfied with the computer-based systems currently supporting marketing strategy development. It appears that most current systems fail to provide even moderate help for most requirements. The four principal factors contributing to managers' dissatisfaction are:

- 1) Individual systems currently used are limited in support capabilities;
- 2) Systems used cannot couple strategic analysis with managers' judgment;
- 3) Particular strategy analysis models employed are limited in function and scope; and
- 4) The systems used cannot cope with uncertainty.

In addition, respondents reported that the main factor holding companies back from using or making greater use of computer based systems in support of marketing strategy development is the lack of appropriate computer-based support systems. The survey also revealed that the computer-based support that marketing directors need most are:

1. Appropriate support systems;
2. Strategic analysis tools and models;
3. Relevant strategic information analysis and interpretation; and
4. Strategic analysis knowledge and skills assistance.

Having identified managers' needs for computer- based support in developing marketing strategy and the gaps between those needs and the current provision of computer-based systems, it should be possible to develop the computer-based systems needed to satisfy managers' perceived needs for support and to fill the existing gaps. New roles for computer-based systems are proposed by Li (1998) as the following<sup>60</sup>

1. Provide and interpret strategic information for the process of developing strategy (McDonald and Wilson, 1990).
2. Provide strategic analysis assistance and organized methods of strategy development to guide the strategy formulation process (Curry et al., 1992).
3. Offer domain expert knowledge at key aspects of key stages of strategy formulation (Duan and Burrell, 1995).
4. Make recommendations for managers in selecting marketing strategy (Duan and Burrell, 1997).
5. Help managers cope with uncertainty and ambiguity in the process of developing marketing strategy.
6. Help managers understand marketing strategy factors and how they interact. . Provide mechanisms to couple systematic analysis with managers' judgment (Mintzberg, 1994a).

7. Help strategic thinking (Mintzberg, 1994b; 1994c).
8. Help scrutinize the proposed strategies against unintended biases (Mintzberg, 1994b).
9. Depict the chosen strategy.

1.2  
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### **Empirical Studies on Using MIKS in Decision Making**

Simate (1973)<sup>61</sup> has stated that information system could be linked with the manufacturing activity. His theory on information system described various components of such a subsystem, their interactions and relations to other subsystems within the integrated information system. He has surprisingly disregarded the relationship of information system with three other major functional aspects of an organization that is finance, marketing and personal. Mensah (1984)<sup>62</sup> has discussed various techniques for classification of information needs of a business organization and progressing an information system design to address their need, they illustrate a formal method for deciding on the configuration of the information subsystems. He described three main criteria as a guide in recognizing the subsystem in any enterprises namely reparability, comprehensibility and flexibility.

Gupta (1989)<sup>63</sup> addressed the wide use of computer in marketing and management of materials in an organization, thus enabling a materials manager to engage in more creative pursuits than the daily routine work. Light has also been thrown on the doubts, distrust reservations associated with the use of computer. Cespedes (1993)<sup>64</sup> in his paper entitled “coordinating sales and marketing in consumer goods firms” found that information systems currently in place often hinder information flows between functional units, and that there is a lake of relevant information available for decision makers concerning customers and channels, leading to difficulties in allocating resources effectively. These outcomes are unacceptable, given the widely acknowledged imperative to pursue aggressively information for competitive advantage.

Suidan (1994)<sup>65</sup> explained that in the last century has been one of the major changes within most sectors of society. Technological advances, increased customer service requirements, and the globalization of the marketplace are about a few of the factors that have contributed to greatly intensified business competition. For organizations competing in today’s rapidly evolving business environment, information has become a critical resource. Indeed, market intelligence has become the cornerstone of any successful marketing plan.

O’Brien *et al.* (1995)<sup>66</sup> mentioned that the volume of data available to the marketing function in customer products companies has grown exponentially throughout the past decade. With this explosive growth has come a corresponding need to transform the data into information, which is usable to assist marketing managers in making business decisions. Concurrently, customer demands forever improving since have necessitated that organizations find a means to simplify and refine the data analysis process in a

manner, which leads to more satisfied customers. A properly designed and implemented MKIS system provides a solution to this dilemma. As described in the previous sections, an MKIS consists of four main parts: database, people, analytical tools and customer service technology.

Demery (1999)<sup>67</sup> mentioned that database marketing is now evolving to the point that the credit-card industry can actually deliver its long-standing promise of providing products tailored to each individual customer. It might however be a technological game limited to the largest of players. Lehaney *et al.* (1999)<sup>68</sup> discussed the definite value of technology-enabled database marketing, and also concluded that its success rests on participative, human centred approaches to development. A marketer tackling specific marketing challenges should not focus on technology, but rather, the business problem. When solving business problems, human experience and creativity provide critical insights and at times viable solutions without costly investment or expansion in the technology. Good and Stone (2002)<sup>69</sup> in their study analyse the impacts of computer use on marketing operations, as a result indicate that using these technologies will help in exploit opportunities, improve work quality and quantity, solve problems and it will improve communication.

While Roge and Chakrabarty (2002)<sup>70</sup> discussed the different methods to measure the efficiency and success of information technology in marketing operations. They were used to support the constructs used in testing relationships between IT assisted communications, productivity of work, operations, decision-making and strategy. They suggest that IT adoption by marketing managers may follow a two-stage process: The first, marketing managers augment their operational capabilities by using IT. Second, these improved operational capabilities lead to a second stage in which marketing managers use IT to improve marketing strategies. Their model of IT in the marketing organization was structured as follows. Organizational communication was conceptualized as IT related improvements in inter-organizational and intra-organizational communications. The quality and quantity of work performed in organizations using IT were viewed as productivity of work. The marketing operations construct measured IT improved marketing functions. The success of IT in improving decisions was seen as improvements in the speed, analysis and ease of decision-making. Finally, the success of IT in improving marketing strategies was conceptualized as a construct representing IT as a source of differential advantage.

Tao and Yeh (2003)<sup>71</sup> introduce two simple yet essential database-marketing tools: i. usage segment code (USC). ii. Net revenue equation (NRE). And their applications in the top ten US credit card business. The promising results further demonstrate that simple yet creative ideas can be converted into powerful database marketing tools to increase the return on investment in a marketing database. Both methods can be used to derive rich customer information that provides vital input to important marketing strategies. This case proves that simple yet powerful database marketing tools can be developed in-house even with a less than perfect data warehouse that encompasses company-wide data over

time or with marts that store department-wide data over time. On the road to on-going database marketing processes, many companies invest millions of dollars in a customer data warehouse. Simple ideas such as USC and NRE can increase the return of these investments.

**Conclusion:**

The use of computer-based information systems in support of developing marketing strategy has become increasingly important. Nevertheless, current support systems developed for this purpose have been found, in most instances, to be less than satisfactory. In this paper, new roles for computer-based information systems in developing marketing strategy have been defined. It has also been argued that hybrid intelligent systems have great potential as an effective means to support the process of marketing strategy development. The paper provides a conceptual framework for the implementation of computer-based support for marketing strategy development and strategic marketing planning.

Marketing orientation neither information orientation are the sole causes of MKIS uptake and sophistication. Other issues such as availability of resources and perceived strength of competitive forces will affect management's adoption/sophistication decisions. For example, earlier research has noted that a number of organizational factors, such as the degree of support for MKIS resources, the size of the MKIS department, and the extent of formal qualifications held by those using the system, can have an impact on the use of MKIS (Fletcher *et al.*, 1996).<sup>72</sup>

The MKIS provides information to assist marketing managers in making decisions. In addition, it may be designed to provide decision for repetitive classes available to all managers, integrate the management of the company. Thus, the company as a system with oil elements working towards common objectives. Any company that believes that it has genuine marketing management information problems and wants to solve them should consider the following measures:

- 1- Place efficient and competent people in each of the formal information systems.
- 2- Examine all the interfaces.
- 3- Examine the logistics system.
- 4-Organize a central computer group for systems control.

Thus, MKIS is efficient tool providing past, present and projected information relating to internal operations and external intelligence. It supports the planning, control, and operational function in an organization by furnishing uniform information in the proper time frame to assist the decision maker. Appelgate *et al.* (1988)<sup>73</sup> commented that earlier generations of managers tended to 'adopt technology first and then try to figure out what to do with it'; they add, 'that approach is now grossly inadequate'. This statement remains applicable today as the intensity of both present and future competition is likely to encourage senior management to replicate the IT interventions of leading MKIS companies. Matching information technology to the organization in terms of its ability to shape the organization is central to success. Part of that matching process rests with

understanding the value of the collection, application and management of marketing information generated by information technology applications such as Data Base Marketing. We speculate that under time pressure senior management in 'second mover' firms are likely to make *ad hoc* adoption decisions without fully considering the match between the technology and the overall value orientation of their organization. Such adoption decisions are unlikely to secure competitive advantage.

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