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Information systems in marketing

Identifying opportunities for new applications

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Introduction

Over the past three decades, subtle changes in the theory and practice of marketing have been fundamentally reshaping companies. These changes have also been evident in marketing and management related information systems.

More and more, companies are faced with the need to control an ever larger and rapidly changing marketing environment. The information processing requirements of companies are expanding as their competitive environments become more dynamic and volatile[1]. To handle the increasing external and internal information flow and to improve its quality, companies will need to take advantage of the opportunities offered by modern information technology (IT) and information systems (IS). Managing marketing information by means of IT has become one of the most vital elements of effective marketing. By collecting and sharing marketing information and by using it to promote corporate and brand image, IS offer new ways of improving internal efficiencies of the firm. Information systems allow dynamic marketing communication between personnel in corporate planning, accounting, advertising and sales promotion, product management, channels of distribution and direct sales.

Information technology-based marketing information systems (MkIS) have been with us for many years. The importance of computers in marketing was highlighted by Kotler[2]. Traditionally, MkIS has been seen as a system to support marketing management in its decision making. In addition to the management perspective, MkIS can be an essential tool for the entire marketing organization. Some researchers have classified IS in marketing by the tasks for which they are customarily used. Moriarty and Swartz[3] proposed a concept of marketing and sales productivity (MSP) systems which consists of four sub-systems: salesperson productivity tools, direct mail, telemarketing and sales management. However, these new, more operational, IS have not yet been used in the context of the MkIS concept.

Essentially the concept of MkIS is wide and loose, ranging from the strategic to the operational levels. To facilitate a deeper understanding of the nature of marketing- and management-related IS, the purpose of this article is to:

- examine and refine the MkIS concept as it is generally given in marketing literature;
- suggest the need for a more specific reconceptualization of the marketing-related IS;
- identify opportunities offered by integrating MkIS with other marketing and management related IS in the company.

This more specific reconceptualization is essential as the importance of IS in marketing will be remarkable in the 1990s. Marketing can no longer be an area of the (few) specialists: everyone in the organization must be charged with responsibility for customers and contributing to developing and delivering value for them[4,5]. According to Webster[6], this customer focus may require increasingly large investments in information management and information technology. The next frontier of automation will be marketing and sales functions[3], and these functions are likely to receive the largest investment of technological resources in the future[7]. It is also evident that many companies have started, or are planning to build, marketing related IS. It is essential now to study and classify these systems in more detail so as to be able to design better and more cost-effective IS in marketing for the future.

In this article, the changing role of marketing in companies is briefly described. The foundations of the MkIS concept over the past three decades are then presented and the new MkIS concept is proposed. In our reconceptualization, the classification of other marketing- and management-related IS, the information flow and technical integration between these different kinds of system are also presented. The results are critically discussed and a more specific reconceptualization of marketing related IS as a field of study and practice is then outlined.

The changing role of marketing in companies

The management approach to the study of marketing can be traced to such concepts as the marketing concept, marketing mix, product life cycle and market segmentation. According to Möller[8], this management approach can be characterized as trying to solve the problem of “how to develop an optimal marketing mix consisting of Product, Place, Price and Promotion solutions for the competing preferences of a chosen target segment of consumers, households or organisational buyers”. The concept of the marketing mix focuses on the need for marketing managers to view the marketing task as the process of mixing or integrating several different functions simultaneously[9]. This management approach evolved in the 1950s and 1960s, when marketing management became a widely accepted business function, growing out of the more traditional sales management approach. Marketing is responsible for more than sales – it is the management function responsible for making sure that every aspect of the business is focused on delivering superior value to customers in the competitive marketplace[6].

In the 1990s the marketing management function and the more traditional, bureaucratic, hierarchical organizations will be complemented by new, more flexible, organizational forms such as strategic partnerships and networks. This means that the marketer will need to manage three sets of relationships – with customers, with suppliers and with resellers. The business is increasingly likely to be a network of strategic partnerships and the business scope will be essentially defined by its customers. In network organizations, especially, the marketing task will include responsibility for being expert on customer relationships and keeping the rest of the network informed about them. The marketing personnel will need skills and knowledge in relationship management and these skills will become valuable business assets[10].

Marketing and management information systems

Classification of marketing information systems

The first definition of marketing information systems (MkIS) was presented by Cox and Good[11]. MkIS was seen as a set of procedures and methods for the regular planned analysis and presentation of information for use in making marketing decisions. Brien and Stafford[12], Smith *et al*[13] and Buzzell *et al*[14] further developed the definition. Marketing information was divided into control, planning and research information[14]. The purpose of the earliest marketing systems was to gather, sort, analyse, evaluate and distribute pertinent, timely and accurate information for marketing decision makers to improve their planning, implementation and control. Uhl[15] pointed out that there is no one MkIS that will serve all organizations because of the unique information requirements of different organizations – they are composed of sub-systems and they have been built over a long period of time.

During the last three decades many authors have presented models for MkIS (e.g. [3,11,15-22]). In Table I, MkIS are presented in terms of typical subsystems and their general dimensions. The models are classified into six groups based on the type of primary use. These classes are data gathering, data analysis, marketing planning, marketing decision making and implementation of marketing activities. The last group, control, is divided into two subgroups: external control (control of marketing environment and activities) and internal control (control of marketing effectiveness, performance against plans and personnel).

MkIS can be classified into two groups based on the organizational position of the users and type of use: the systems for the managers and the systems for operational sales and marketing activities. The users of marketing management and decision-making systems are primarily senior executives, strategic business units (SBUs) and marketing managers, marketing analysts and experts. Often experts use raw data and refine them to information and finally to knowledge needed by managers. In modern marketing thinking, MkIS are not simply systems limited to management. They include also operational, sales and marketing process-oriented systems, which serve in daily marketing operational activities such as direct mailing (database marketing), telemarketing and operational sales

Author	Subsystems	Subsystems use
<i>Management marketing information systems</i>		
Cox and Good[11]	Support systems Operating systems	Data gathering Analysis, planning, control (internal)
Uhl[15]	Current awareness systems In-depth and crisis information systems	Data gathering, control Analysis, decision making
Graf[16]	Incidental information systems Data storage and retrieval systems Monitoring systems Analytical information systems	Analysis Data gathering Control Analysis
Kotler[17,18]	Internal records systems Marketing intelligence systems Marketing research systems Marketing decision support systems	Control (internal) Analysis, control (external) Analysis Analysis, decision making
Piercy and Evans[19]	Marketing productivity analysis systems Marketing intelligence systems Marketing research systems Market and marketing mode systems	Analysis, control (internal) Analysis, control (external) Analysis Analysis, decision making
Proctor[20]	Planning systems Control systems Marketing research systems Monitoring systems	Analysis, planning Control Analysis Control (external)
Sisodia[21]	Statistical models Optimization models Expert systems Data aggregations	Analysis, decision making Analysis, decision making Decision making Analysis, control
Li[22]	Input subsystems: data processing, marketing research and intelligence Output subsystems: product, price, place, promotion and marketing-mix	Data gathering, analysis, control Analysis, decision making, planning
<i>Operational marketing information systems</i>		
Moriarty and Swartz[3]	Salesperson productivity systems Direct mail and fulfilment systems Telemarketing systems Sales and marketing management systems	Data gathering, implementation Data gathering, implementation Data gathering, implementation Analysis, control

Table I.
The evolution and major subsystems of marketing information systems

management. The users are middle management and operative sales and marketing personnel.

Systems introduced in traditional MkIS are, however, only one part of the IS, totality in marketing. The purpose of the following sections is to clarify the applicability of MkIS to other marketing and management related IS, such as operational transaction processing systems (TPS), management information

systems (MIS), decision support systems (DSS), executive information systems (EIS or ESS) and expert systems (ES).

Transaction processing systems

Transaction processing systems (TPS) represent the most elementary level, and earliest use, of computers in business applications. TPS are used for daily marketing related operations such as order entry, order processing and invoicing routines. The output of these TPS for management is normally a set of standard reports produced on a periodic basis. The focus is on reducing costs, improving accuracy and allowing quicker access to data concerning day-to-day operations. TPS can be seen as "organizational message processing systems"[23], informing managers with up-to-the-minute assessments of organizational performance and long-term records of past performance. They also span the boundary between the organization and its environment by connecting the customers and partners to the firms' warehouse, factory and management. Today inter-organizational relationships and inter-organizational information systems (IOS) have become a common form of TPS. There are many examples of IOS that create electronic linkages between firms (e.g. [24,25]). A typical IOS is an IS which links one or more firms to their customers or suppliers and facilitates the exchange of products and services[25]. Bakos classified IOS into two categories: information links and electronic marketplaces. The key distinction between these categories is that the former exist in a bilateral setting, where a relationship between a supplier and a customer has already been established, while the latter exist in a multilateral setting with the goal of establishing bilateral buyer-seller relationships[25].

Management information systems and decision support systems

There are many definitions of management information systems (MIS) and decision support systems (DSS) (e.g. [26-31]). MIS provide managers with reports and, in some cases, online access to the organization's current performance, and historical records. They are developed to facilitate the use of diverse sets of data. Generally, they condense information obtained from TPS and present it to management in the form of routine summary and exception reports. However, MIS have limited analytical capabilities when compared with decision support systems (DSS).

DSS is an interactive computer-based system designed to help in decision-making situations by utilizing data and models to solve unstructured problems[27]. The aim of DSS is to improve and expedite the processes by which management makes and communicates decisions – in most cases the emphasis in DSS is on increasing individual and organizational effectiveness.

It is very difficult to tell precisely where the interrelatedness of various business functions to one another vertically and horizontally is emphasized. Similarly difficulties exist in telling where MIS or DSS systems end and MkIS begin – or in distinguishing the total system. Piercy and Evans[19] have differentiated MkIS from MIS and DSS as follows:

- The MkIS is part of the MIS or DSS – namely, that part which deals with marketing strategy and operations.
- The MkIS is an MIS or DSS, because it conforms to the definition and underlying concepts presented earlier, though its interests are to some extent more specialized than are those of the corporate MIS.
- However, because it is an MIS, in the real world the MkIS serves the company, not simply a department, i.e. it provides marketing information to senior management and across business functions.
- In an ideal world, the MkIS takes information from other departments' or functions' information systems, such as the financial systems and the production systems, e.g. costs and product flows.

Following these classifications, the MkIS can be defined as an MIS or DSS which relates to marketing activities and marketing information. A more formal definition of marketing DSS (MDSS) is presented by Little[32]. There are many proposed areas of use for MDSS. By using the marketing mix as a framework to classify these uses, “product”-related systems are presented, e.g. by Lilien[33], Goslar and Brown[34], Knuckles[35], Conlon[36] and Choffray and Lilien[37]. Similarly “promotions”-related systems are presented, for example, by Green *et al.*[38] and Knuckles[39].

The use of MDSS in the operational management of sales staff was proposed by Lodish[40] and Collins[41]. They suggested the use of MDSS to increase salesforce productivity. Little[32] recommended MDSS use in developing and managing both the strategic marketing process (see also [42]) – in developing regional marketing programmes – and marketing planning activities (see also [43]). Van Nievelt[44] suggested MDSS use for improving marketing productivity, and Knuckles[39] for competitive advantage.

In addition to MIS and DSS a new era of management and decision-oriented information has arrived – executive information systems (EIS or ESS, executive support systems). These systems support decision making of senior management. Compared with DSS, EIS tend to be less rigorous. Instead, they deliver graphs and data from different sources (i.e. reports, documents, mail, external data banks, and the like) to the senior executive to be used at a strategic level of the organization (see, e.g. [30,45] for more information on EIS/ESS).

Expert systems in marketing

Expert systems (ES) assist in decision-making situations by solving problems that normally require human expertise. ES are those systems the primary knowledge of which is obtained from experts for use in relation to a given problem or task domain[46]. The main components of an ES are inference engine, knowledge base and user-interface (see, e.g. [47,48] for more information on ES). According to Wierenga[49] formal modelling is appropriate where analytical models outperform marketing experts, and the ES approach can be used when experts outperform formal models and have a reasoning mechanism that can be captured in rules or other knowledge representation devices.

There has been a growing interest in ES in marketing. An example of this is highlighted in the first issue of the *International Journal of Research in Marketing*, 1991, which was totally dedicated to marketing ES. Wierenga[49] has completed a review of operational marketing ES. He uncovered 21 ES in marketing, of which only nine were complete operational-level systems. Keon and Bayer[50] developed ES for recommending consumer promotions. In addition to existing ES, there are, however, many proposals of such marketing problem areas that could be readily amenable to future ES applications. Rangaswamy *et al.*[51] proposed new product design (see also [52,53]), product launch, advertising and promotional planning (see also [53]), positioning, pricing (see also [54]) and retail site selection, as such areas.

The need for a new framework for the information systems in marketing

Critique of MkIS models: The models of the MkIS concept can be seen only as proposals of ideal and “complete” MkIS architectures. Models of MkIS have had the same basic functions since the beginning. One reason for this is the fact that managers’ tasks have remained almost the same. Companies have always gathered formal or informal marketing information from internal and external sources. Managers have used this information as a tool in marketing management (analysis, planning, implementation, control). However, existing MkIS models are based on traditional bureaucratic, functional and hierarchical organizations, and the basis for MkIS development has remained almost unchanged. The objective has been to implement MkIS, which cover almost all management activities in the sales and marketing functions, and produce timely and accurate information to be used in decision making. This so-called MIS approach, which was popular in the 1970s, can be seen clearly in the MkIS models referred to earlier.

This approach can be misleading, however, since with this kind of thinking, developers may omit more important issues – company strategy, business and marketing processes – especially the marketing management process. Business processes consist of sets of logically-related tasks performed to achieve a defined business outcome[55]. The marketing management process is defined by Kotler[18] as a process which “consists of analysing market opportunities, researching and selecting target markets, developing marketing strategies, planning marketing tactics, and implementing and controlling the marketing effort”. The traditional organizational principles of functional hierarchies and the Tayloristic principles of task specialization have led to many islands of optimized activities that are hardly linked. “Each organisational sub-unit within the process had optimised its own IT application, but no single sub-unit had looked at (or was responsible for) the entire process”[55]. Earlier it was believed that achieving maximum efficiency in doing single activities would improve the whole process. However, this is not necessarily true – while the efficiency of a specific task may be improved, the overall effectiveness of the process may suffer[56]. Therefore, the whole process with all its activities and its linkages needs to be considered.

The basis for MkIS and other marketing- and management-related IS development, subject to management needs, should be company strategy, related

management processes and, in marketing, particularly the marketing management process. This kind of thinking leads us to a key concept – business process re-engineering. Re-engineering is the fundamental analysis and radical redesign of business processes by using the power of modern IT in order to achieve dramatic improvements in critical measures of performance[57]. Benjamin and Scott Morton[58] have proposed that a radical redesign of functional processes is a way not only to improve effectiveness but also to develop strategic IS – systems which bring competitive advantage to the company. As functional hierarchies are replaced by cross-functional networks, the organization of the future will be designed around business processes rather than functional hierarchies[59].

This networking leads us to discuss more closely another concept related to business process re-engineering – i.e. integration.

Critique of technically integrated MkIS: The concept of MkIS seems to be based on an assumption, that, in order to improve the effectiveness of marketing, the MkIS must be the integrated totality of its major components. By integration we mean the realized possibility of getting separate components or parts of a system to work effectively together (technical integration). While, for example, Kotler did not give any explicit definition of, or argument as to why integration is needed, it is quite clear that, in his view, the four sub-systems together form the concept of MkIS as an integrated totality. There are also other proposals of integrated MkIS similar to Kotler's (e.g. [3,20,21,60-62]).

One should ask: is the sophisticated integrated system really needed by marketers, or is it just a theoretical ideal? From experience in IS design and implementation we have learned that large and complicated systems are difficult and costly to develop and maintain. However, sound reasons for integration can be found in marketing literature. First, there is a general requirement for marketing organizations to improve their effectiveness through identifying different segments in the markets. This entails more pertinent, accurate and timely marketing information. Marketing managers need more sophisticated methods to handle the data and the several types of data analysis[63]. Second, the benefits from integration can be remarkable and they are closely related to improved targeting of new clients and the existing customer base, improved quality of services to both employees (internal) and customers (external), increased orders, improved analysis of potential and reduced costs (see, e.g. [60,64,65]).

It commonly appears in marketing literature that the implicit motivation for integration is technical, not functional. IS are taken mainly as links between separate user groups in hierarchical organizations or work chains. The normative goal of the ideal conceptual architecture seems to be improved co-ordination of information between the different vested interests – e.g. levels of management and sales personnel or linking the marketing data in a more effective and sophisticated way[66].

The normative goal of all marketing- and management-related IS integration should be functional integration in addition to technical integration. By functional integration we mean the systematic redesign of several

organizational functions as presented earlier. We argue that MkIS and other marketing- and management-related IS, presented earlier, are simply separate IS; therefore they should form, following deep and systematic redesign, an efficient marketing and management systems totality.

MkIS and other marketing and management related IS should be an elementary part of that totality, and which helps to manage crucial marketing and management processes – especially the marketing management process. If the developers concentrate all marketing- and management-related IS development efforts towards re-engineering and the development of marketing processes, they will at the same time improve information support for management needs. Information needed in a marketing management process relates to a larger concept, the corporate planning process. On this “upper level” process, MkIS and other marketing related IS are elementary parts, especially in marketing information management and decision making.

A framework for integrating marketing- and management-related information systems

The relationship of MkIS to other information systems in marketing

A literature review of IS in marketing and critical analyses makes it evident that the notion of MkIS has to be conceptualized in a new way. We have included in Figure 1 an extensive review of marketing and management related internal IS. Other business functions, like finance, personnel and production, have their own IS. Furthermore, we relate them to primary tasks in the marketing management process. We also indicate, by using arrows and numbers, data transfer between different IS in marketing (numbers 1-14). A continuous line shows data transfer between MkIS and other systems; a broken line shows data transfer between other marketing and management related IS (TPS, MIS, DSS, EIS/ESS).

Data gathering: the focus of data gathering for marketing is the customer base, competitors and the marketing environment in general. The data from these components are stored to organizational TPS (Figure 1, arrow 1). It may also be stored directly to operational MkIS (arrow 2); or data may be transferred to operational MkIS through TPS (arrow 3). The data in TPS are essentially quantitative. On the other hand, marketing information gathered in operational MkIS is qualitative in nature, especially concerning customers' buying behaviour.

Order status, sales forecasts and other management reports are normally presented in MIS. The sources of these figures are especially TPS (arrow 4) and operational MkIS (arrow 5). In addition to these figures, there is a need for external marketing information to complement internal information which supports, explains and deepens the information available (arrow 6). If needed, external marketing information can also be transferred directly into DSS, management MkIS and EIS/ESS (arrow 6). External information sources in these systems are mostly data banks and commercial databases.

From data to information and knowledge: TPS are, together with operational MkIS, essential systems for gathering marketing information. Operational MkIS are, in addition to this, vital for implementing marketing and sales activities. All

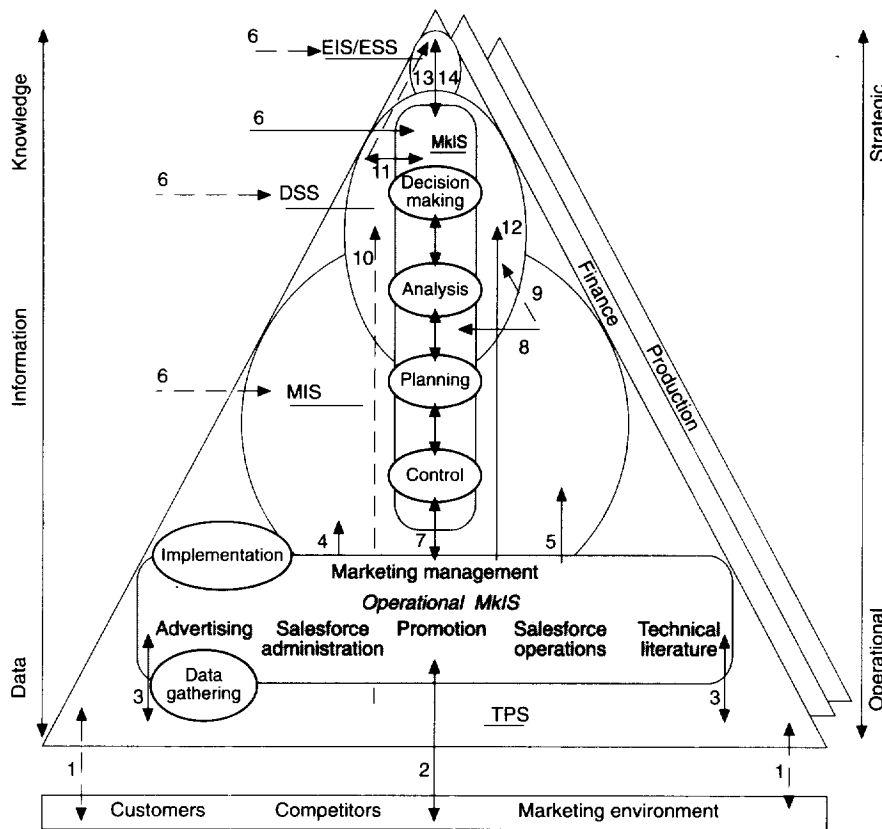


Figure 1.
Information systems in marketing

information systems presented in Figure 1 are used for refining and analysing marketing information needed as a basis of marketing planning and decision-making problems facing the company. However, in operational MkIS the direction of data and gathered information is twofold – gathered and analysed information is also used in different sales and marketing activities, such as direct mail and telemarketing.

Management controls markets, plans marketing activities, analyses target markets and makes decisions based on the information offered by MkIS. Vital internal information sources for management MkIS are operational MkIS (arrow 7) – (especially concerning qualitative customer and market information) – and MIS in general (8). This information, which is gathered for planning and decision making, is used in management MkIS. The objective of management MkIS is to transform data to information and finally to knowledge. This knowledge is needed especially in R&D, market forecasting and planning. Thus, MkIS can be seen as an integrated, intensive and vital part of a company's IS portfolio.

Analysis and decision making: As one can observe from Figure 1, the MkIS have clearly become a tool for analysis and decision making, and have developed closer to DSS. Information sources for DSS are illustrated in Figure 1 (arrows 6 and 9-12).

From the MkIS, market information needed in decision-making situations is transferred to DSS (arrows 11,12). Senior executives analyse the information from different sources by using EIS/ESS (arrows 6, 13, 14) in addition to DSS. Sales- and marketing-related decisions made by senior executives are returned to management MkIS (arrow 14), which itself is transferred to be implemented in operational MkIS (arrow 7).

More detailed classification of marketing information systems

Based on this critical review of presented literature in the field of MkIS and notions imposed on it, these systems can be divided into the subsystems components as illustrated in Table II.

Management marketing information system: The first era (early-1970s to late-1980s) in MkIS development was to provide standardized reports with multiple

Subsystems	Subsystems use	Description
<i>Management MkIS</i>		
Marketing intelligence systems	Analysis, control (external)	Identifying problems, changes and opportunities in the external marketing environment
Marketing research systems	Analysis	Collecting information that is relevant to a specific marketing problem facing the company (e.g. market survey, advertising effectiveness study, product launch timing, pricing)
Market decision support systems (MDSS)	Analysis, decision making	Consisting of all available data pertinent to marketing combined with extensive statistical and modelling capabilities and an appropriately designed user interface for making improved marketing decisions
Marketing planning systems	Analysis, planning	Managing the whole marketing planning process from analysing marketing opportunities to planning marketing tactics
Marketing control systems	Control (internal)	Monitoring of personnel, marketing activities and effectiveness, and performance against plans
Marketing report systems	Control (internal)	Reporting on sales calls, expenses, orders, order status, sales forecasts, account (customer) status, etc. (i.e. management reports)
<i>Operational MkIS</i>		
Marketing and sales productivity and support systems	Data gathering, implementation	Managing distributors and accounts, tracking leads (prospects), co-ordinating sales activities, updating customer information, etc., updating mailing lists, personalized mailings (direct mail) and telemarketing activities

Table II.
Major subsystems
of marketing
information systems

sources of information to multiple organizational units within large firms[37]. From the marketing management point of view, MkIS are tools for managing marketing information, marketing research, modelling marketing transactions, decision making in marketing, planning marketing strategy and tactics, budgeting, analysing different courses of action, and reporting and control[22,63,67,68]. MkIS have been tools for analysing both internal and external effectiveness of marketing and for controlling marketing activities and environment. MkIS can be seen as a natural expansion of traditional market research[69]. From the planning point of view, analysed data in MkIS are used as a basis for planning, but planning itself is done in other systems and often manually. Implementation and control of these plans is then performed with the help of management and operational MkIS.

Operational marketing information systems: The objective of operational MkIS is to manage sales and marketing activities in a company's value chain. "The value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation"[70]. In addition to this, the objective is to increase the efficiency of planning, implementation and control of different marketing functions.

Typically, salespersons use operational MkIS for planning, implementing and reporting on their activities. Information gathering is considered to be an essential function of the whole marketing organization, though it is especially the function of sales representatives. In this way they gain access to customer information that would not be available to them from any other sources[71]. Shaw and Stone[72] have defined database marketing (DBM) as "an interactive approach to marketing, which uses individually addressable marketing media and channels (such as mail, telephone, and the salesforce) to extend help to a company's target audience, to stimulate their demand, to stay close to them by recording and keeping an electronic database of customer, prospect and all communication and commercial contacts, to help improve all future contacts and to ensure more realistic planning of all marketing". With DBM, the MkIS database can be used to segment a company's markets and to record responses and reactions of customers and prospects to company initiatives. In some companies, telemarketing (a version of DBM, in which the marketing channel is the telephone) has become an essential part of the marketing campaign process and the company's MkIS.

In Figure 2 we have represented the marketing management process (see critique of earlier MkIS models) and positioned the different IS in marketing on this representation. These IS together form an all-embracing marketing and management systems totality.

Marketing operates on three levels: corporate, business (or SBU) and functional (or operational[73]), reflecting three levels of strategy. While these three types of strategy are distinct, they should come together in order to form a coherent and consistent whole. In Figure 3 these MkIS subsystems are divided into three distinct levels of strategy on which the market operates.

Marketing tasks on different levels of strategy can be found especially in large traditional hierarchical structures. In network organizations marketing has a unique and different role. At the corporate level, "The role of marketing is to help

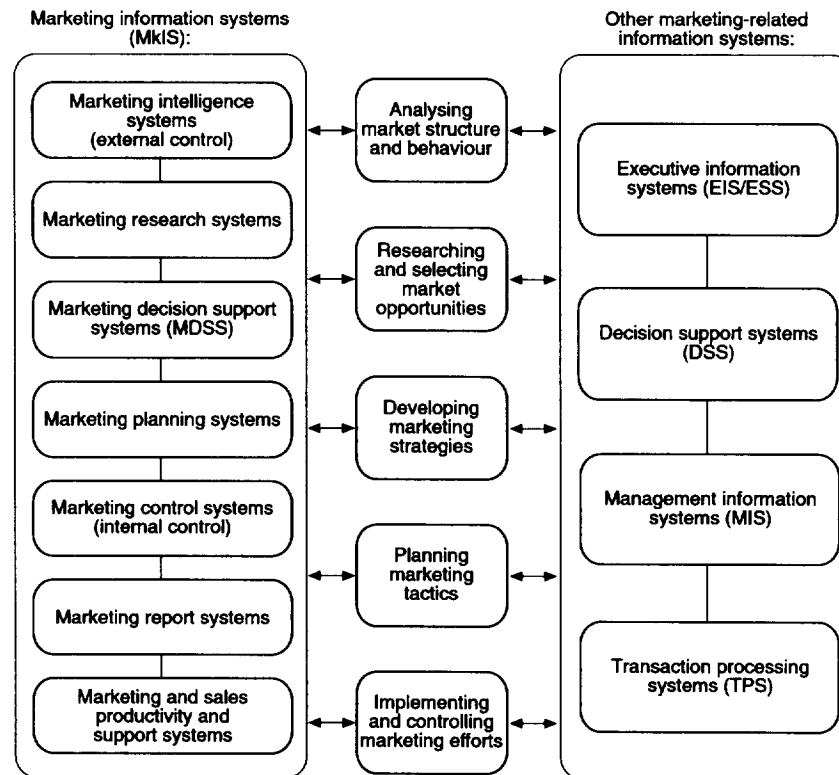


Figure 2.
The marketing
management process
combined with IS in
marketing

design and negotiate the strategic partnerships with vendors and technology partners through which the firm deploys its distinctive competence to serve particular market opportunities"[6]. Correspondingly, at the business unit level, "Marketing managers have a new responsibility for deciding which marketing functions and activities are to be purchased in the market, which are to be performed by strategic partners, and which are to be performed internally"[6]. Counterparts for these tasks, on both levels of strategy in MkIS, are marketing intelligence, research and planning IS. In addition to these, marketing reporting, control systems and especially DSS, are used in strategic decisions – such as whether to depend on markets, long-term relationships, strategic alliances or integrated hierarchies (corporate level) – and decisions about when and how to partner (business level).

At the operational level, key activities are co-ordination and relationship management. These activities are knowledge-based and involve the management of information[6]. At this level of strategy, marketing and management related IS (e.g. DSS and report and control systems) are used by functional specialists, marketing managers. Operational sales and marketing personnel use marketing and sales productivity and support systems for relationship management by responding to customer needs and for developing long-term relationships.

<i>Level of strategy</i>	<i>Emphasis of marketing^a</i>	<i>Counterpart in management MkIS</i>
Corporate:	Market structure analysis Customer orientation and advocacy Positioning the firm in the value chain	⇒ Decision support systems Planning systems Intelligence systems Research systems Report and control systems
Business (SBU):	Market segmentation and targeting Positioning the product Deciding when and how to partner	⇒ Decision support systems Planning systems Intelligence systems Research systems Report and control systems
Operational:	Marketing mix Managing customer and reseller relationships	⇒ Decision support systems Report and control systems ⇒ <i>Counterpart in operational MkIS</i> Productivity and support systems

^a see [6]

Figure 3.
The subsystems of the MkIS and the three levels of strategy

Final remarks, summary and conclusions

In this study, our aim was to examine and refine the MkIS concept generally given in marketing literature and to suggest the need for a more specific framework of the marketing and management related IS. Our analyses were based on a literature review in the context of marketing management and IS in marketing.

To make our study feasible, we limited our analysis mainly to traditional, internal IS, i.e. our approach was focused on customized and human-centred IS in marketing – rather than on mass transaction and technology-centered marketing related IS, which are designed especially for electronic markets.

Critical notions to the MkIS concept and reconceptualization of IS in marketing

MkIS are an elementary part of a company's IS portfolio. Based on our literature review, we reconceptualized the MkIS, dividing them into two main groups by type of use and by organizational position of the users: operational MkIS and management MkIS. Management MkIS can be further classified into marketing management and decision-making systems. Correspondingly operational MkIS can be classified into operational, sales and marketing process-oriented systems.

According to Martell[74], MkIS can be seen as part of the so-called management information systems (MIS) concept, which deals in particular with marketing strategy, marketing planning process and operations. This MIS approach is suitable for traditional bureaucratic hierarchical organizations, which, however, will be replaced more and more by new flexible organization forms, such as strategic partnerships and networks. This means that marketing and the traditional marketing function now also have a changing role in organizations. Therefore, we argue that the MIS approach can be misleading, because, with this kind of thinking, a company can overlook more important issues – company strategy, business and marketing processes, especially the marketing management process. We argue that the basis for most marketing and

management related IS development, subject to management needs, should be company strategy and (redesigned) marketing processes management, with the help of sophisticated IS. We also argue that most marketing and management related IS presented earlier are simply separate IS, and that they should form, after a deep and systematic redesign, an efficient marketing and management systems totality. The normative goal of this integration should be functional integration in addition to technical integration.

After the introduction of this “upper level” classification of management and operational MkIS, we also reconceptualized the different subsystems of the MkIS. Based on our analysis, the MkIS can be divided into the following sub-systems: report systems, control systems (internal control), intelligence systems (external control), research systems, decision support systems, planning systems, marketing and sales productivity and support systems (see Table II). In a more detailed analysis, we divided these subsystems into three distinct levels by strategy (corporate, business and operational), presenting counterparts for marketing tasks on different levels of strategy in MkIS (see Figure 3). This classification was presented both for traditional hierarchical organizations and for modern and flexible organizational structures, such as network organizations.

We are in a new era of marketing-related IS development and we have seen a growing interest in the use of marketing decision support systems (MDSS) and marketing expert systems (ES). These systems and techniques are designed to be used in complicated marketing decision-making problems. Even if the use of marketing ES and MDSS is still at a very low level, the importance of these kinds of solution will grow rapidly in the 1990s[68,75]. Executive information systems (EIS/ESS) are used for planning, control and decision-making purposes by senior managers. One part of that information flow needed by senior managers, pertinent marketing information, is gathered and delivered to EIS/ESS, mainly through MkIS.

Conclusions

Information technology has a key role to play in new flexible organization forms such as strategic partnerships and cross-functional networks. While new organizations will be designed around business processes rather than functional hierarchies[59], we definitely have a need also for new kinds of IS in marketing. In fact, IS will be the cornerstone of a new approach to marketing. Therefore management and systems designers should be better aware of the avenues available to integrate marketing and management processes in new innovative ways.

We have examined and refined the MkIS concept generally given in marketing literature and have proposed the adoption of an all-embracing marketing and management IS totality. We have also suggested the need for a more specific reconceptualization of marketing and management related IS. To test its merits, empirical research is needed. A pivotal question for future studies would be, for example, what subsystems of MkIS are used and how does the usage differ as between strategic, tactical and operational levels of strategy? This question leads

to a key issue facing a company – how to design better and more cost-effective IS in marketing? One has to remember, however, that each company takes its own course of action, which makes it different from its competitors. Therefore it is very difficult to find a comparable generalized IS in marketing in the real world. This must be noted in empirical research planning and by researchers in analysing results.

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