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Marketing Information Systems As A Driver Of An Organization's Competitive Advantage

Bernard F. Kubiak, PhD, Full Professor
University of Gdańsk, Depatment of Information Systems; High School of Tourism and Hospitality in Gdańsk
Author's Personal/Organizational Website: **www.wzr.ug.edu.pl**
Email: **ekobk@univ.gda.pl**
Dr Bernard F. Kubiak is Full Professor of Information Systems and Information Technologies at The Department of Information Systems (Faculty of Management) at the Gdańsk University. His researches and didactics focuses on informatization strategy of organization, systems analysis, knowledge and information management, ecommerce, organizational performance and electronic business strategies. He has published books and articles in many national and foreign journals and publishing houses. He has gained extensive experience as system analyst and as application specialist in formulating and realization of informatization strategy in organizations.

Michał F. Kowalik, PhD
Technical Assistant to Intel EMEA General Manager and Corporate Vice President
Postal Address: **Intel Corporation, Al. Jerozolimskie 146c 02-601 Warszawa, Polska**
Author's Personal/Organizational Website: **www.intel.com**
Email: **michal.f.kowalik@intel.com**
Dr. Michał F. Kowalik is professionally related to the business operations of the worldwide leading semiconductor manufacturer. His current duties involve practical application of the various management theories, information management as well as the broad economics. His research publications include papers in the several conference proceedings, profiled in both technical and economical area.

Abstract

In the current environment companies need to strive to increase effectiveness and speed of their decision making. Various studies show that this influences both

competitive position as well as financial results of those companies, both in the long and the short term. Information systems are the key tools to facilitate progress of the organizations. This paper presents approach to structural analysis of the information gaps, information system modeling, marketing system implementation as well as verification of the achieved effects.

Keywords: **decision making, information systems, marketing, competitive advantage, marketing information system, modeling, team collaboration**

1. Introduction

Decision making in the fast moving companies is a key for success – research reveals (Blenko, Mankins, Rogers, 2010) that decision effectiveness and financial results correlated at a 95% level or higher while no strong statistical relationship between structure and performance. The most important catalyst of the decision making process is information, which is mostly provided by information technology (IT). This observation is mostly relevant to finance, operations, logistics as well as marketing.

Marketing information systems are widespread in contemporary companies and various solutions have been implemented in order to help sales and marketing organizations in their day-to-day business. However, decision makers repeatedly ask the following question: "Did implemented systems positively influence the competitive advantage of the company?" (Porter, 2006). The purpose of this paper is to answer that question as well as to build a unified model for marketing information systems (MIS) that can be implemented in various companies across the information technology (IT) industry and beyond.

2. MI processes and MIS usage at OEMs

The main portion of this dissertation's research was conducted among six biggest Personal Computer (PC) Original Equipment Manufacturers (OEM) and one semiconductor manufacturer. The main goals of the research were to identify the structures of the MI organizations, review the market information sources used in the researched companies, build a consistent model of MI activities, review the impact of market globalization and fragmentation, and list all of the information technology (IT) tools used in those organizations for MI purposes. All of these steps were taken in order to create a clear vision of the current status and to build a foundation for an MIS model.

All research subjects were multinational companies with headquarters (HQ) located in various geographical locations. The basic similarity was that all the sales & marketing organizations were more or less independent from their respective HQ and were able to run marketing activities with some degree of independence. However, the structure and location of MI functions differed heavily within three main areas. The first main area of difference was the level of centralization of the MI activities. The results of the study reveal that the majority of the respondents had smaller MI organizations spread within various groups in the company, while a smaller portion of the respondents had centralized all MI activities within one team. The second dimension of MI differentiation was the size of the MI team, which varied from an organization with several employees with roles and responsibilities around various MI functions to the single employee having a fraction of their time designated to all MI. The third dimension of MI differentiation was the level of integration of MI functions within the company. Few respondents stated that there existed centers of MI competence such that no other

group was expected to run any MI activities. In fact, the majority of the respondents stated that while there is an MI team leading all of the functions, all other groups are allowed to run their own MI activities as well.

For the next step, this author aimed at gathering information about sources of market data used in the researched companies. While a whole list exceeds the purpose of this paper, it is important to note that of all the researched companies used the same sources of data and differences were fairly negligible. All companies used the same retail, reseller, and distributor tracking data, as well as the same sales information. All of the researched companies conducted both regular and ad-hoc primary and secondary research when specific focus was required. This was an important premise for reviewing activities done with that set of information.

The study outcome allowed the observation of five general types of MI activities within each organization. While specific situations will be reviewed in later sections, most typical activities can be structured into the following five groups:

- Standard reporting was the most common activity within all companies and it included both high level and detailed reporting of various market indicators. This activity kept employees up-to-date by circulating information about topics such as quarterly sales, average prices, inventories, and new products launched by competition;
- Ad-hoc reporting was identified as a tool for obtaining expanded information about results gathered from standard reporting or creating complete pieces of information covering topics such as news markets, products, and segments;
- Another important group of activities within MI activities was in-depth analysis, simulations and business forecasting. While the majority of the researched companies relied on external information, some respondents admitted that specific teams inside the company are chartered to do more sophisticated activities;
- The fourth most common activity was the role of document base keeper, a role which involved the storage of all acquired and created documents (outcomes of both internal and external research) in one place within the company;
- The most sophisticated (and unfortunately, the least common) role was that of the trusted consultant. Very few respondents stated that they are part of bigger business teams where representatives of MI organizations act as internal consultants at a level equal to other team members.

There were few main differences between the companies and these differences are described now. First, depending on the proximity of their customers, companies had separate organizations focused on analyzing data from customer relationship management only. Very few companies had separate organizations chartered with forecasting & simulation activities. Yet another interesting activity [found in more than half of the companies] was the analysis of channel partner sales and the construction of motivational programs based on those data.

Globalization and geographical spread of sales & marketing teams created interesting day-to-day issues. The first most interesting finding was that in the majority of researched companies, local MI structures were dependent on their HQ counterparts. This observation was also observed when scaled down – the local MI structures were easily able to run regional and country level activities given some similarities at the lower geographical level (channel structure and customer profiles, as examples). One of the biggest problems was the rotation of the MI staff as very often knowledge about specific processes was gone after an employee's departure. An additional complication was the fact that the demand for market information was exceeding the maximum time

availability of the full-time MI employees. As a result, alternative staffing techniques were implemented (contractors, interns).

The biggest surprise from this study involved the status of the existing IT tools used within companies. The most common, and most obvious, was a broad usage of office packages (Microsoft Office and similar). Vast amounts of data were processed, distributed and stored in those applications. Few attempts were made to standardize data and create entry level MIS based on the workgroup tools (such as Microsoft SharePoint and Lotus Notes). Yet another surprising item was the fact that there were various homegrown database systems in place (from simple shared drives to sophisticated Google-like systems). Several data vendors offered advanced solutions based both on the programming capabilities of Microsoft Office and on other applications such as QlikView. Solid MIS were implemented in only one of the researched companies, where many processes were reengineered in order to match new information flow.

The research results allowed this author to confirm one of the secondary hypotheses, namely, that all of the MI activities are similar in all the companies, and that the differences are relatively minor. These results also allow this author to attempt to build a model of MIS, where all observed MI processes will be standardized in order to fit relevant requirements. The outcome of this work will be reviewed in the next section.

3. The MIS model

The results of the primary research allowed this author to build a comprehensive MIS model. Based on the research outcome, this author has divided the MIS model into the following six groups:

- A basic processes group that includes standard and ad-hoc market information sharing;
- An advanced processes group that includes business forecasting, secondary research consolidation and primary research activities;
- A market monitoring group that includes the continuous tracking of a company's results versus identified goals and KPIs (KPIs);
- An external processes group that includes the cooperation of the MI organization with external entities (data suppliers, customers, partners, industry consortia);
- An educational processes group that covers tasks such as knowledge capital gathering within the MI organization;
- An administrative processes group that handles all other MI processes not covered by the other groups (data purchasing, data upload, data integrity verification, MIS expansion).

Among the researched companies, the processes of standard and ad-hoc reporting are the most common. In observed scenarios, a business user contacted an MI organization in order to obtain a set of requested information. This process included the following steps: market data sources review, precise data request expression, potential decision of market data purchase, processing of the requested the market information and identification of the need for cyclical reporting. Several enhancements of the process have been found. For example, several iterations of the information access at the lower granularity levels are often required due to increasing needs of business users. Additionally, the need for publicly quotable market information is often requested from public relations (PR) teams. Further, the creation of executive presentations with a strong focus on the graphical side of the material was also identified as an area of enhancement.

The advanced processes are further expansions of the basic ones, where more sophisticated actions are being taken. Within that group, this author has identified the following three types of activities:

- Business forecasting covering following steps: formulation of the research problem, identification of the research premises and statistical data review, forecasting or modeling within the expert group, application of the forecast, evaluation of forecasting accuracy and identification of the need for a forecast refresh;
- Consolidation of secondary research: formulation of the research problem, analysis of available information, decision-making regarding further acquisition of information, initial information analysis and assessment of its usefulness, full consolidation of available information along with conclusion and information reporting, publication and archiving of the outcome;
- Carrying out of primary research: formulation of the research problem, creation of the research brief, external agency hiring decision, creation of detailed research documentation, fieldwork, data cleaning and verification, creation of the draft summary report and initial presentation, creation of the final document, presentation of the final findings, publication and archiving of the outcome;

Contrary to the basic processes, advanced MI activities are rarely repeated several times a day – this is due to their heavy resource requirement. Usually, there are several advanced processes at various stages of development running in the company at the same time.

The market monitoring processes are characterized by an ongoing tracking of various measurement points within industry to allow a company to act quickly when new opportunities or competitive threats are found. These processes are the ones conducted most frequently and they are required to be the most precise, as very often they influence employees' commissions. Usually market monitoring also includes set of KPIs, which are used to benchmark the performance of the company against its goals. This group of processes involves the following steps within specific market segments: creation of market monitoring patterns, cyclical analysis of market data, creation of more granular reviews and consideration of their inclusion into regular process, adjustment of the market monitoring content and cessation of market monitoring.

The external processes of the MI are somewhat similar in each of the three previously described groups; however, as the name suggests, the external processes are focused on cooperation outside the company. The most commonly observed activity within this group was the exchange of market information with partners and customers. This exchange included assessments of the market information value, exchange purpose, and exclusivity of the data usage. The second most commonly observed activity within researched companies was the participation in industry consortia. The basic process started with a company sending data to the administrative party. Then, the administrative party processed all member-level data into an aggregated data set and then the member companies analyzed the aggregated data. All aspects of this process are similar to the basic MI processes; however, this process demands a much higher degree of precision and punctuality from the members.

The educational processes are mainly visible only inside the MI group where knowledge about data acquisition, processing, and analysis is being developed through years of practice. Knowledge of the activities within parts of the certain MI processes was held by individuals only. The natural way of sharing such knowledge was mainly based on sharing experience during work on the specific projects. In the event that an employee was lost due to rotation or general absence, that employee's knowledge was

irretrievably lost. In order to prevent the leakage of the most valued capital, this author sees a need for MIS functionality that would be able to retain knowledge within the company. The most common processes around building knowledge base structures are following: knowledge development and acquisition, knowledge codification, knowledge transfer and knowledge usage.

The administrative processes are secondary to all of those mentioned above; however, they are invaluable in the day-to-day work of an MI organization. The usual flow of administrative activities within one market data type is: market data acquisition, propagation of available market data within the company, draft verification of the data, market data integration (market data upload into the relevant IT systems), market data correction (in case of observed errors), adjustment of the market data purchase scope in order to meet the organization's requirements, and cessation of the market data processing if the information is no longer needed.

A detailed review of all listed processes allowed this author to build an MIS model based directly on the six processes that have just been detailed. This theoretical model will be tested against real and hypothetical usages in the next section.

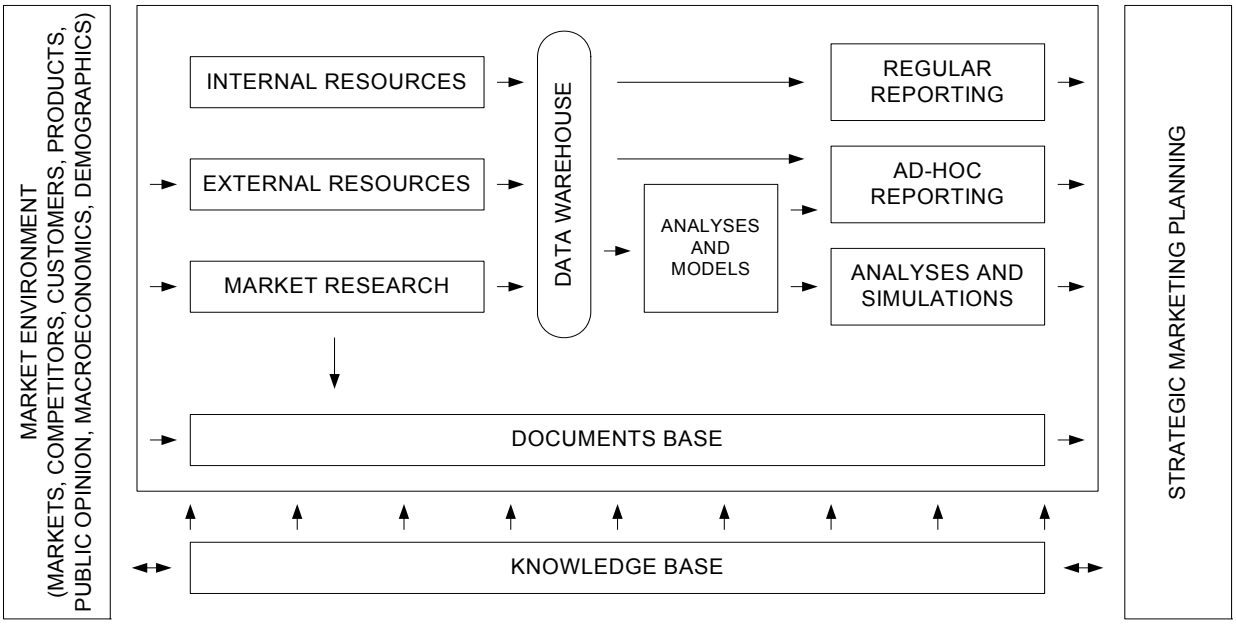

Figure 1: *Marketing Information System (MIS)*
Source: Kowalik, Gepner, 2007

4. Verification of the MIS model based on empirical and hypothetical system implementation

In order to verify if a proposed model is able to fulfill user needs, one needs to test its implementation in both real-life and hypothetical scenarios. In the following paragraphs, this author will review high level findings of this part of research.

The real-life implementation has been conducted where several elements were created. The main goals of the implementation and their solutions were following:

- Centralization of storage for the secondary research analyses stored in reports, presentations and press notes.

For this purpose, two tools were created. These tools maintained all external information within a document base solution. This allowed the company under study to store all available information in one base where a search engine could be used to

retrieve requested information. The other application of these tools was the creation of a repository of links to guide employees to external resources. In both cases, home-grown software has been used and there was a small team of employees working on maintaining both complementary solutions.

- Unification and consolidation of market tracking devices.

Until the moment of MIS implementation, databases with external market data had been stored in several inconsistent Microsoft Office files. Easy usage of those files was significantly outweighed by lack of data consistency, file size limitations, and the inability to merge several sources in the one view. In order to solve that problem, a solution based on Teradata Warehouse was implemented, where strictly formatted data is uploaded to central databases. This helped in shifting workload to a powerful server infrastructure.

- Creation of a single data repository for various quantitative activities.

The existence of a single information repository allowed the company to create a business intelligence (BI) solution with access to nearly all of the data possessed by the company. One of the interfaces was designated for business users and these users were able to obtain key metrics for their strategic marketing planning activities – both from using a designated website, Microsoft Office applications as well as email inbox.

- Automation of market data reporting.

During preparation of the interface for the analysts, the need for easily accessible cyclical reporting was observed. One of the functionalities of the implemented BI system was based on the automatic send-out of summarized reports based on newly uploaded data. This allowed business users to have their key indicators delivered directly to their email inboxes seconds after data arrival. One source for all data sources allowed for the creation of analytical applications based on a BI solution in order to give analysts broad access to market information.

- Formalization of MI knowledge.

Due to the impact of the economic crisis, plans for creating a knowledge base have been postponed. The most probable solution to be implemented within MIS in this area is based on Wikipedia, which is a method that will allow the formalization of knowledge by various employees working simultaneously.

MIS implementation has been run with joint efforts of MI, business operations, IT and business users significantly geographically dispersed. All activities were scheduled with precise project management techniques. First, financial estimations proved that in the first year of MIS operation, the company saved over $300 ths. An equally heavy lifting effort was made in order to change processes among business users, where desires to remain in the comfort zones of using standard Microsoft Office applications were strongly persistent.

After two years of MIS implementation, this author has conducted series of studies around awareness, usage and business users' perception. The most interesting results of that research were (1) Elements of MIS were used regularly by over 50% of the business users, and (2) 75% of all regular users stated that this system has increased the competitive advantage of the company. These results were confirmed by data taken from the usage logs of the MIS system. During the first 12 months of system operation, the number of frequent users consistently increased and then reached a plateau which was maintained through the rest of the system life. This author also surveyed users to inquire about their further needs within the market information area. The need mentioned most frequently was the need for a one-stop for both internal and external information. This request been considered by IT teams and is considered to be outside the scope of this author's dissertation.

Further verification of the MIS model required an analysis of hypothetical scenarios.

Although this author has witnessed interesting developments of MIS systems within the surveyed companies, due to confidentiality issues he was not able to participate in the implementations. This author will present four scenarios where the proposed MIS model can be applied to fix identified issues. All of the described problems have been observed by the author in the past.

The first scenario is based on the case of the company that has broad access to market information as well as MI; however, the company suffers a significant lack of market information flow. Market data are rarely turned into executive summaries and MI employees continue their analytical work without a major impact on the company's behavior. For this scenario, the most important recommendation in MIS implementation is a change of the company's culture with regard to market information circulation. Implemented MIS needs to have a functionality of the managerial dashboards, where executives have access to almost live information about their current business. MI employees should also try to turn from being solely market analysts into consultants and provide a value-add activity of pointing out new opportunities and real threats. While standard reporting needs to be automated, more insightful analyses need to take place in order to give clear and actionable advice to the management.

The second scenario is the case of an American-based company that was very successful in gaining market share. Recently, activities around marketing mix were not very successful, and the company started falling behind its competitors. Management decided to centralize all of the functions and run the local businesses from HQ. The company's biggest problem was its blind trust in one of the market information sources. This source proved to be accurate enough in the past; however, it was highly inadequate for the current market conditions. Implementation of the proposed MIS model could help the company two-fold: firstly, the company would be able to combine a greater amount of information sources in one place in order to verify the data and secondly, the market monitoring capabilities within the MIS model would make the company better able to adapt to market needs. The automation of basic processes within standard and ad-hoc reporting would allow the company to go one step further in running more sophisticated analyses.

The third scenario is based on the case of a company that has emerged from being a component provider to being a fully operational PC OEM. For a very long time, the company did not need a specialized organization; however, by entering such a competitive market, this need has been escalated. This scenario brings an excellent opportunity to propose implementation of MIS in the "from scratch" mode. First of all, the company needs to designate a team (or one senior employee) to be a main contact for market information. A freshly created MI organization should focus on the basic MI processes as well as market monitoring processes in order to start making the company aware of the current market situation and expected future developments. At the same time, the MI organization should also build an indexed document base which would allow the company to store all available market information in one virtual place. Once all three groups of processes are implemented, the MI organization should start participating in key business meetings in order to become an integrated part of the working teams, where gathered market information can be successfully used.

For the fourth hypothetical scenario, this author aims to demonstrate that the proposed MIS model is not only created for big organizations. There are many smaller, local companies that lack consistent market information flow. This could be solved by designating one person from the current staff (such as someone involved from the finance or marketing team) to MI activities. As costs are always the key focus of small companies, all MI activities should be based on analysis of newspapers, internet and

frequent discussions with other industry players. This knowledge needs to be stored in an easily accessible system; however, in this case there is no need for sophisticated IT solutions. Simple free or cost-effective cloud-based solutions seem to be a good choice here.

All four scenarios demonstrate that there is always a possibility to apply an MIS model to an organization's needs. This, however, needs to take into account three aspects. In the organizational aspect, this author recognizes the need for close cooperation between project members from different business backgrounds (IT, MI, business users), identification of "project sponsors" within senior management, and promotional activities during and after implementation in order to counteract potential resistance from other employees. Larger-scale MIS implementation can start only when an MI organization has become a trusted advisor to primary business operations. The second aspect covers several objective areas like the presence of a clear vision of MIS implementation and perfect knowledge of MI processes by the MI organization. Third, technological aspects cover precise exploration of the requested MIS functionalities as well as precise identification of the information system (IS) which is capable of handling the requested functionalities.

5. Conclusion

The results of the primary research, synthesis of the secondary data, as well as the utilization of the delivered model verified the need of the MIS science in the company. The rationale behind MIS implementation is the natural tendency of marketing teams of gathering information about relevant markets (Kotler 1999). The span of such activities can be very wide, from the completely unstructured and chaotic approach at one end, to fully organized processes at the other. Results of the primary research showed a wide spectrum of MIS sophistication in the studied companies, which puts a spotlight on the importance of market information flow efficiency. These same results allowed this author to identify common features of MIS which can improve usage of information capital. The most important features are as follows:

- MIS usage should be simple and it needs to be treated as an everyday tool for business users;
- MIS should be used by both junior level users and senior managers to provide information from the same source, but aggregated at different levels;
- MIS needs to be continuously supervised both by MI teams who make sure that the content is flawless, and IT teams who monitor the technological content (Kowalik, Gepner, 2009)

References

Blenko M.W. Mankins, M.C. Rogers P. (2010). The Decision-Driven Organization. The Harvard Business Review, June 2010, 54-62

Kotler P. (1999). Marketing. Felberg SJA. 16.

Kowalik M.F. Gepner P. (2008). Knowledge Management in Market Intelligence: Know-How importance in Sales & Marketing Information Systems. Studies & Proceedings Polish Association for Knowledge Management, 47-54

Kowalik M.F. Gepner P. (2009). Marketing Information Systems usage in large high-tech organizations - theory and practice. (in:) Bernard F. Kubiak & Antoni Korowicki (eds.), Information Management, Gdańsk University Press, Gdańsk

Kubiak B. F. (1994). Analiza systemów informatycznych, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk

Kubiak B. F. Korowicki A. (2009). Integration of Knowledge Management System with a Contemporary Business, (in:) Bernard F. Kubiak & Antoni Korowicki (eds.), Information Management, Gdańsk University Press, Gdańsk

Porter M.E. (2006). Przewaga konkurencyjna. Wydawnictwo Helion. 27