

Evolution and Extension of the Model of Marketing Information System (MIS)

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Abstract: Article is devoted to the overview of model of the marketing information system (MIS) and its components. The author suggests expanded ISM model which more corresponds to the modern realities. In comparison with classic model which was introduced by F. Kotler in 1997, is evolution of Internal records System into System of collecting, sequencing and storage of information. Additionally the author's model is extended by two necessary systems – Decision Support System (DSS) and Identity and access System. The necessity of changes and extensions is coming from growth of volume, speed of inbound flow and number of sources of information as well as the number of MIS contributors and users.

Key words: Marketing information system (MIS) • Information system • Marketing • Information • Decision Support System (DSS) • Data Storage System

INTRODUCTION

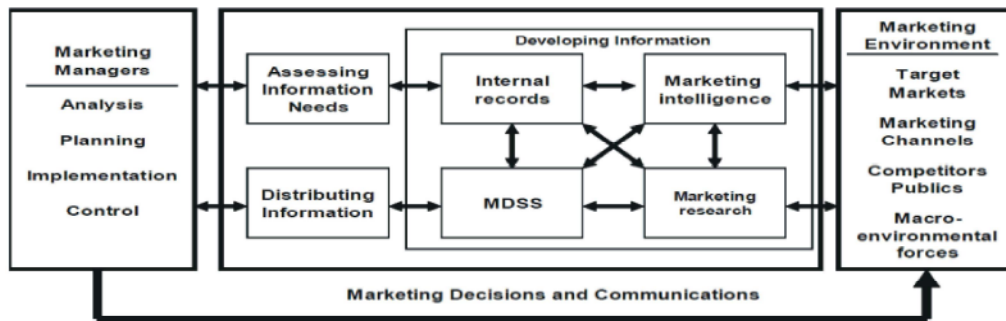
In 1997 F. Kotler introduced the term marketing information system (MIS) – that is constantly operating structure of interconnection of people, equipment and procedures. The purpose of this system is to collect, classify, analyze, evaluate and distribute actual, timely and accurate information in order to improve planning and control of marketing activities. The scheme of the system is given in Picture 1:

- Internal Records System (IRS);
- Marketing Intelligence System;
- Marketing Research System;
- Marketing Decisions Support System (MDSS).

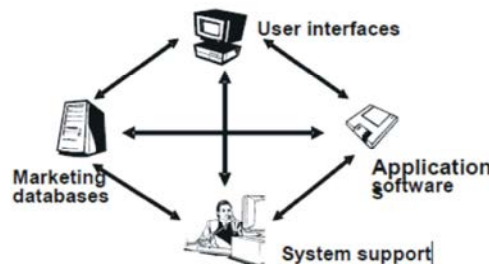
More obscure definition was given by Naresh K. Malhotra: the marketing information system is formatted order of actions for obtaining, analyzing, storage and distribution of necessary information on regular basis for people responsible for marketing decision making [2, p.38]. Similarity of the two definitions mainly lies in the systematic process, i.e. not only information is important but that it is regularly kept up-to-date. What makes them different is that the latter regards only the function without paying attention to MIS structure, which the author believes really significant considering the following model.

Here the question arises - when, where and mainly why did the information become so vital for a company? The explanation is the transcendent tendency of the end of the twentieth -beginning of the twenty-first century which determines the development of the world economy and consequently dictates conditions to companies – that is the process of globalization. In the age of globalization knowledge and technologies of fast information interchange become the main driving power. Picture 2 shows interconnection between growth of information technologies and its impact on the economy. Because of significant decrease of development and deployment of new information technologies, their potential to influence the economy grows; new opportunities for job and production appear as in every sole company as well as in the society in general.

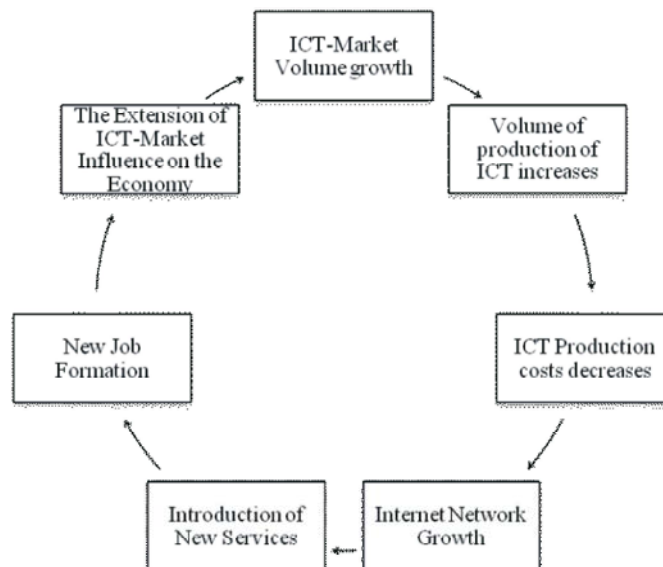
Information technologies have changed the modern world, expanded labor market and allowed to use qualified manpower more efficiently, increased export of services and goods, strengthened enterprises competitiveness, but what is more important that information technologies made information volume quickly expanding and multiplying. More than 90% of the world current information has emerged in the last two years. As the result, the experience of managers has lost its importance for the strategic development of the company. Therefore, knowledge how to collect, develop and interpret information from different sources, both



Pic. 1: The Marketing Information System. From Marketing Management: Analysis, Planning, Implementation and Control [1]



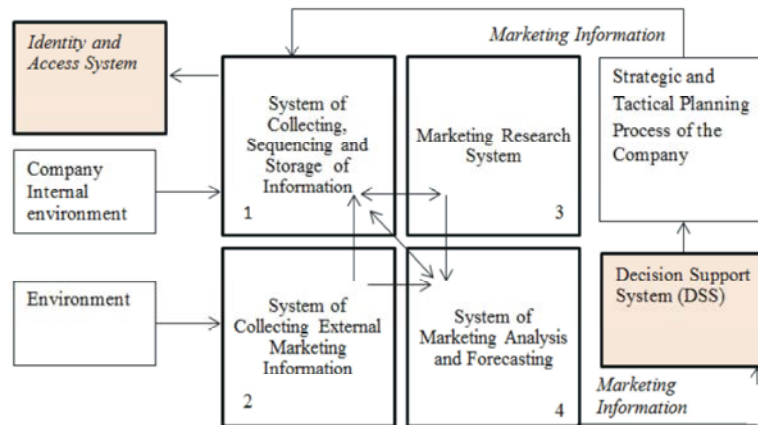
Pic. 2: Functional elements of MIS [3]



Pic. 3: Interconnection between Volume Growth of Information Technologies and its Impact on the Economy [4, p. 26]

internal and external, is of the key value for any contemporary marketing expert and economist. It is worth noting that the whole model of the MIS starts working efficiently only if the organization has high level of automation. It also needs considering such a fact that during the evolution of information systems the structure of the system made by F. Kotler experiences changes itself (MIS model offered by the author can be seen in Picture 3).

Components Overview and Model Changes: The main change in the structure is evolution of the internal records system (IRS) into the system of collecting, sequencing and storage of information (SCSSI). It can be explained by the fact that the volume and rate of information and the number of sources have significantly grown. According to The InfoPro, Wave 11 «the expenses increase for the data storage system² in an average company Fortune 1000 exceeds 50% per year» [5]. Due to the International



Pic. 4: Marketing Information System (MIS)

Research Agency IDC expenses on the data storage system take the second place among the expenses on information technologies and accounts for 23% of total world expenses on IT [6]. All that leads to the necessity to give more attention to the information sequencing and storage in particular. Apart from replacing one module in the system, it is also important to add some new components. Since the number of users who need the access to some kind of information has increased greatly, such element as the identity and access system (IAS) designed for the protection of the collected information and access limitation to confidential information. It is also worth adding into the model the decision support system (DSS), which in many information systems classifications stands independently or even is opposed to MIS [2, p. 38].

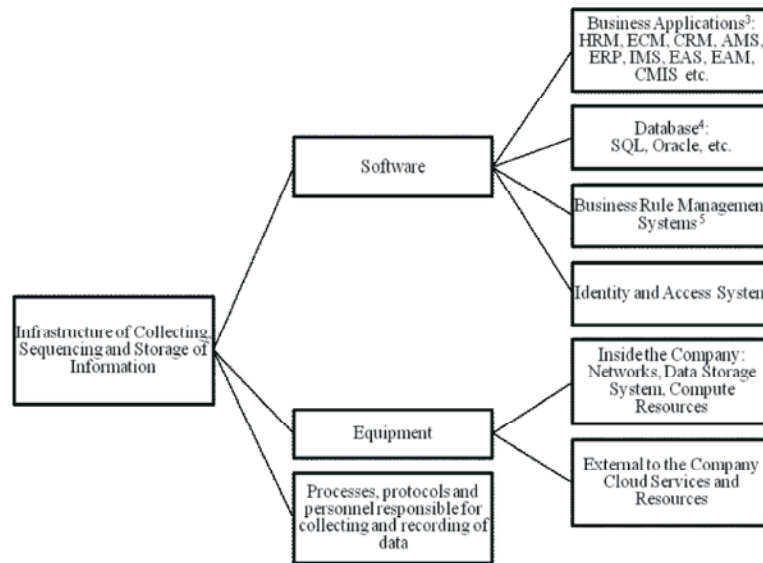
MIS composes of the following subsystems and components:

The System of Collecting, Sequencing and Storage of Information (SCSSI): The system of collecting, sequencing and storage of information (SCSSI) is the basis of MIS, it is where all the data and information, collected by a company over the period of its existence, are stored. Formulated differently, the data get into the system systematically from the environment: directly from internal environment, from external by means of other systems forming MIS.

The system of collecting, sequencing and storage of information consists of the complex of information technologies, formalized methods of sequencing and processing and personnel responsible for collecting and entering data. A great number of business systems used in a company have daily-changed databases, which contain large volumes of valued data without

which the company is not able to operate efficiently. At the same time these databases are one of the most fundamental sources of data for the SCSSI. Further to it, SCSSI comprises own database containing, as a rule, data collected to support marketing tasks only. The system gets data from all departments of the company, thus the infrastructure of SCSSI is rather complicated. However, without continuous access to necessary information, it is considered not to exist. Therefore, the important part of the infrastructure is the equipment providing storage and security of the data. This equipment can be located inside the company and consists of network, the data storage system, compute resources, or it can be represented with external Cloud Services or combination of two approaches. The phase of the lifecycle of the object of automation, that is the level of business development, significantly influences the development of SCSSI. The more complicated the structure of implemented software and company equipment is, the more important how information flows and data management interfaces are arranged. Big companies can use specialized software to manage information flows. For instance, business rules management systems allow to adapt habitual terms and definitions to programming languages and let non-specialists interact with IT- systems without involvement of IT-experts.

The access to the data within the system of collecting, sequencing and storage of information is limited by the identity and access system, which must provide secure identification of a user and contain a policies according to which a user or a group of users are permitted or prohibited to get access to a particular information. Besides, the system must provide audit of access.



Pic. 5: The Infrastructure of Collecting, Sequencing and Storage of Data

The System of Collecting External Marketing Information:

The system of collecting external marketing information, oftentimes called intelligence system, is responsible for collecting information from external environment. According to the definition by F. Kotler– «Marketing intelligence system is ordered collection of information resources and procedures of getting it used by managers for recreation of the up-to-date picture of changes happening in the market environment» [1]. The system under study gets information from some key directions:

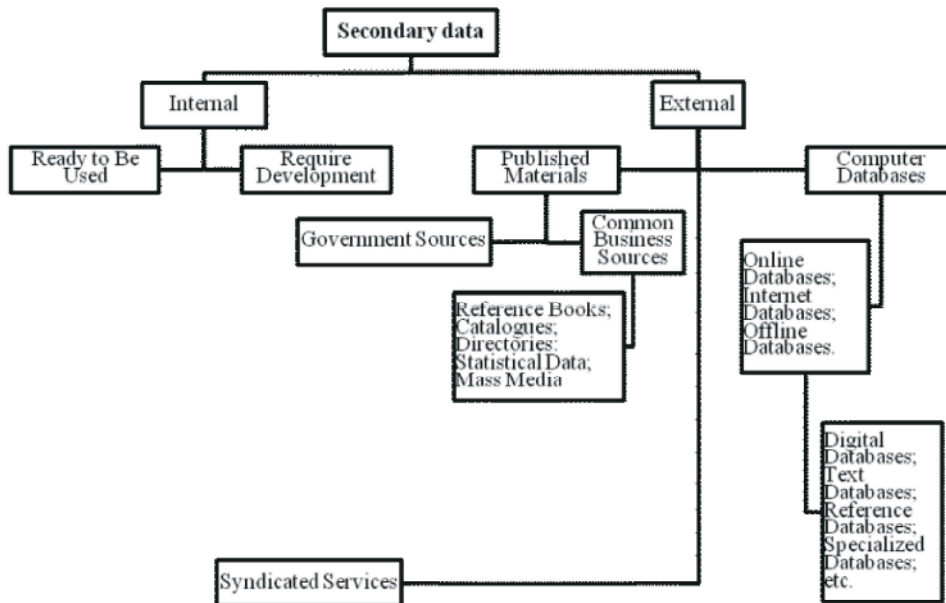
- Information from suppliers and intermediaries who people from the company constantly communicate with;
- Attending special events: exhibitions, seminars, conferences, “open days” etc.
- By studying secondary information, including Internet resources and Opinion Mining systems.

We will examine the last component of getting data in a more detailed way as recently its role has been growing. A decade ago secondary information⁶ meant the following:

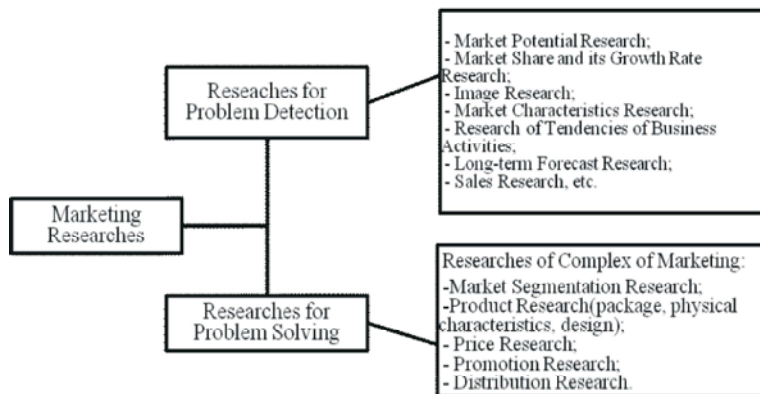
Yet with the advent of the Internet the ways of obtaining information changed significantly, most conventional sources turned out abandoned, nobody draws information from television and radio, print media undergo difficulties and are gradually turning into or combining their activities with electronic formats. Statistic data and many other things became accessible by the

Internet. As the result, there has been too much available information and there appeared other methods of obtaining information, therefore mass media monitoring services are becoming more popular and are often outsourced. Innovative are also Opinion Mining systems⁷ which recently have been widely used in large companies for automatic scoring (positive, negative, neutral) of news, products, personalia, organizations, world countries and etc., coming online from electronic mass media, blogs, discussion forums in the Internet and etc., that is all that is determined by the common term Social Media, Social Media Monitoring particularly.

The Marketing Research System: In some cases, information collected by SCSSI is insufficient for well-considered decisions. For example, in case of negative symptoms being the consequences of unknown problem, or when the problem is known but the solution has not been found. Supposing a company encounters unusual seasonality of demand: as a rule, during the period under consideration “peak” season with sales volume increase is expected, but on the contrary what we face is stagnation. What is it connected with? Is it the beginning of some negative tendency that the company must assess as a threat and accordingly find protection actions against it or is it just state of the market fluctuation? There can be other favorable reasons in the necessity of marketing researches, e.g., company rapid growth and possibility for company growth strategy. In all these cases, decision maker needs deep assessment of the situation.



Pic. 6: Sources of Secondary Information



Pic. 7: Marketing Research Classification

In the majority of cases companies initiate marketing researches to detect the problem and deal successfully with it [2, p. 35]. In such approach to the determination of the problem there are possible problems which can emerge in the future either after making some significant strategic decision or idleness.

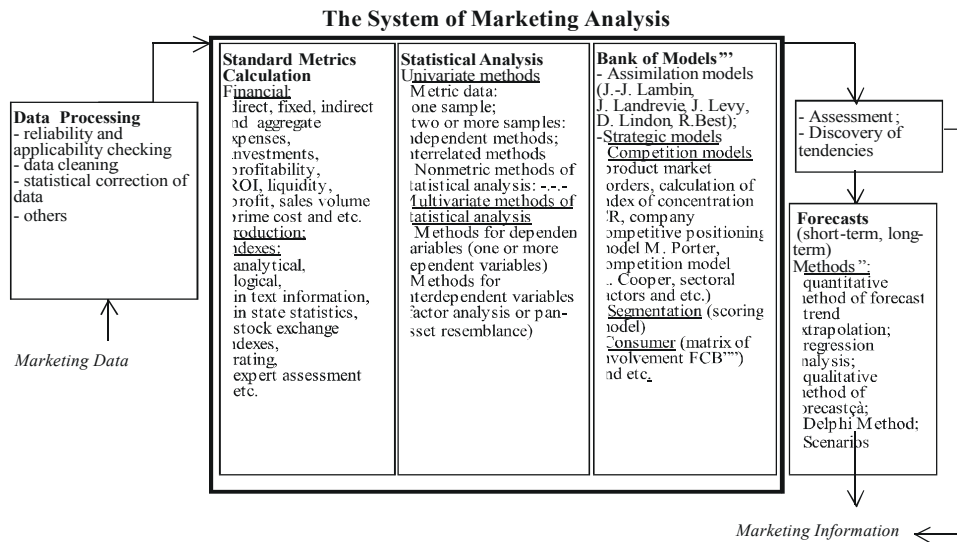
Researches can be performed by using own resources of a company as well as by outside services when researches are outsourced to unaffiliated consulting research companies. These companies, in their turn, can be world-famous blue chip companies with great experience or on the contrary, small companies specialized in one problem or in one market. The majority of large companies have own marketing research departments with the staff varying from one analyst to some dozens of people. Research plan developers, statistics developers,

sociologists, psychologists, modeling specialists are found among department employees. But even if the company has own professional analytical department it must collaborate with analytical agencies to get extended information concerning competitors and the market the company operates in.

The System of Marketing Analysis and Forecasting:

The system of marketing analysis and forecasting comprises a set of actions:

- Processing of data entering the system: the data are checked for reliability and applicability, then it follows by data cleaning and statistical correction;
- Low-level analysis: calculation of standard metrics for the company;



‘apart from renowned standard metrics, the company can calculate other actual for their business metrics’
 “the most popular forecast methods”
 “it is impossible to name all models, here are given only some examples”
 “Foote, Cone and Belding”

Pic. 8: The System of Marketing Analysis and Forecasting [2, 7, 8]

- High-level analysis: it includes statistical analysis and analysis on known or accepted models in the company; for the last several decades theorists, practitioners and marketing experts from different companies have created a great number of models intended to help decision makers in marketing sphere to cope with professional activity better. Nevertheless, many companies do not have such analysis;
- On the basis of the information from the system of marketing analysis (block 2 and 3) assessment is made, tendencies are discovered, recommendations for further company development strategy are made;
- Forecasting which is considered in recommendations.
- Active systems directly participate in developing the right decision;
- Cooperative systems suppose interaction of DSS with the user. The user can improve and enhance the proposal made by the system and then send it back to the system for checking. Afterwards the proposal again is given to the users until they approve it.

Due to the spheres of usage we identify global and desk DSS. Global ones work with large data storage systems and they are employed by many users. Desk systems are not large and they are appropriate for managing from the computer of one user.

In order to expand the capabilities of MIS it is worth including the decision support system (DSS) in the model, which gives decision makers possibility to interact directly with analysis models and databases. DSS is an integrated system consisting of facilities, databases, software with the help of which information necessary for decision making is collected and analyzed.

Three types of DSS are distinguished by interaction with the user [9]:

- Passive systems facilitate decision making process but cannot make specific proposals;

Summary: The advantages of accurately-developed MIS are obvious, so it is not surprising that there already exist some solutions which resemble MIS in one form or another. The most structurally similar solution is the platform of Business Intelligence (BI) – a set of technologies, program software and processes intended for meeting business targets by using existing data in the best way.

Analysts from international research company Gartner [5] reckon that 15 key capabilities grouped by three main categories must be realized in the BI platform:

- Integration capabilities: BI-infrastructure, metadata managing, elaboration for company needs, interaction – BI platform must contain facilities for exchanging information, as well as opinions concerning end results.
- Providing information (reporting) – capability for creating formatted and interactive reports with comprehensive mechanisms for their distributing and updating; dashboards; ad hoc inquiries; integration with Microsoft Office applications; possibilities for search; mobile capabilities (this functional block combines instruments which allow to deliver reports and contents of dashboards to mobile devices).
- Data analysis: operative analytical data processing (OLAP, OnLine Analytical Processing); interactive visualization; predicative modeling and data mining; scorecards; perspective modeling, simulators and optimization.

All these components are included in theoretically-developed MIS presented above (Picture 4).

In conclusion, I want to say that the market of business analytics is growing at a good pace, the volume of Russian market of BI-systems in 2012 accounted for RUR 39 675 million, which shows rates of growth by 15% in comparison with 2011 and over the year 216 famous Russian projects were realized in this area [10].

CONCLUSIONS

As a conclusion of article author assumes the following points:

- The BI systems market in Russia is just starting to form and fast growth is a result of immaturity of market. Now only a few companies are deploying full-scale BI systems while other deployments is limited by certain parts. The key reason is high price on such kind of deployments. In the same time, usage of MIS model could grant to SMB a useful tool without deployment of full-scale BI system and significant spends because focuses on easy and effective methods of analysis.
- When exists, BI system is just a tool, which includes User interfaces and Application software. For integration of BI system into MIS, company should accurately build information flow within MIS, create rules for users who contribute or consume the information as well as set policies of access to information.

- Creation of MIS in organization needed not only on developed markets or with stable growing environment. Usage of MIS gives even more competitive advantages on emergent markets or into recession periods because allow to make quick tactical and strategic decisions based on reliable and high-quality data. That's why development and deployment of MIS becomes today so important for organizations.

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Glossary:

¹The Internal Records Systems (IRS) – set of data reflecting the current state of the company, accomplished business operations. Internal records reproduce current sales index, total of expenses, volumes of stock of materials, cash flow, receivables and payables data [1].

²The Data Storage System —conglomerate of specific hardware and software assigned for storage and delivering of large information array. It allows to store information with optimal allocation of resources.

³Business Systems Interpretation:

- Enterprise Resource Planning – ERP
- Enterprise Application Suites - EAS
- Integrated Management Systems - IMS
- Automated Management Systems - AMS
- Customer Relationship Management –CRM
- Warehouse Management System – WMS
- Human Resource Management – HRM
- Enterprise Content Management – ECM
- Automated Bank Systems
- Enterprise Asset Management – EAM
- Content Management Interoperability Services - CMIS
- Etc.

⁴Database – objective set of independent materials (articles, calculations, standard regulations, law reports and other corresponding materials), arranged in a way so that these materials can be found and processed with electronic computing machine.

⁵Business Rule Management System (BRMS) - an integral component of company information infrastructure designed for creation and usage of the model formally describing decision making logic (business logic) in the form of business rules – declarative statements in the terms of business users, indicating fulfillment of some actions when definite conditions are fulfilled.

⁶Secondary information, secondary data – information collected preliminarily for other goals not connected with the issue of the current marketing research.

⁷Opinion Mining systems – computer systems for intellectual automatic extraction of so called «subjective» information (opinions, evaluative judgments, attitudes, emotions, feelings, religion and etc.) from text information.