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CRM AS A WAY TO INCREASE THE EFFICIENCY OF MANAGEMENT IN A VIRTUAL ORGANIZATION¹

Abstract: The paper attempts to identify the systemic aspects of the use of CRM tools to increase the efficiency of management in the distributed processes organization. It presents the requirements and restrictions for the virtualization of access to technical resources, technology and information in the so-called “cloud” as a way to reduce costly IT investment, especially in SME-class organizations.

Keywords: CRM, management, distributed processes organization, virtualization, integration.

1. Introduction

Nowadays, information and knowledge about clients (both potential and real) is a value in itself. This information can include not only the actual and previous needs, but also the preferences that may be the basis for the forecasting and planning of relevant business processes. Due to this, the vendor is looking more often for customers, following them to meet their needs. To implement such a conceived model, the use of broadly understood mobility is necessary – the mobility of the company and its employees in changing their approach to the processes occurring therein. These processes are designed to integrate their implementation, not only locally but also globally with the use of external resources. In the near future, no company will be able to effectively work autonomously and must learn how to make money together. The best “tomorrow’s companies” will be modular, and available resources will be just a component of a wider structure determined by the value of the process. The market shows irreversible trends to share knowledge and executive capabilities with external regulations. Among the major market players we hear more about cooperation than competition. Therefore, tools allowing the sharing of information are indispensable. This article attempts to identify the systemic aspects

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of the usage of CRM tools to virtualize the organization process in order to increase the effectiveness of the management of mobile, spread and modular organizations. Integrated management systems are an integral element of managing a modern organization. Due to flexibility and efficiency, network structures are increasingly dominating hierarchical ones. This type of organization requires access to adequate resources and relevant information resources – their own and potential partners’ – with a particular emphasis on the business needs and the real owner of the actions, meaning the customer. Thus, CRM (Customer Relationship Management) systems are the real base of a successful business. If to this assumption we add the world of potential clients and the possibility of direct access to them (in the net), then we draw near to the virtual model.

2. CRM as a component in a distributed organization

The customer relationship management system (CRM) is a package of tools and procedures relevant to managing contacts. It is used to build long-term and lasting relationships with customers that are valuable for both the company and the customer. However, it should be noted that CRM is not just a tool, but also part of the strategy and business philosophy where constant contact plus keeping up with the requirements and customer evaluations area key value. The implementation of CRM changes the approach from regular customer feedback to advanced business strategies, in which the client is an integral part of the decision-making process. To function properly, it is necessary to provide a uniform system across all business processes throughout a distributed organization – from the beginning of production, distribution and sales through to service. Such a range of information enables the preparation of relevant statistics used in creating the product portfolio.

CRM systems are now treated as integral parts of management support systems for both class OLAP² and OLTP³ and DSS⁴. Nowadays, when companies put an emphasis on the integration of business processes, CRM are fully integrated solutions, joining not only operational, analytical and communication functions, but also providing a dedicated interface for direct interaction with the Integrated Management Information Systems (IMIS) implemented in the organization, for instance, with ERP II. During its evolution IMIS covered in their scope a more and more functional area, providing information support for further areas of the organization. Today, these systems tie the world of the consumer with the manufacturer/service provider. CRM systems also extend the models of functioning and are now an important part

² On-Line-Transaction-Processing: systems with current image of functioning organization.

³ On-Line-Analizing-Processing: analytical systems with historic (long duration) image function organization.

⁴ Decision Support Systems: systems with functions OLAP and data-mining/discovering of knowledge.

of the implementation strategy of the process organization as a tool to integrate and support a distributed organization.

3. CRM environment as an integration platform for management processes

Management itself is a category of integrating the set of processes expressed by management functions. These processes are focused on the resources of the organization in order to achieve the objectives of the organization in an efficient and effective way [Griffin 1998]. Management functions, such as planning and decision-making (defining the mode of action), organization (coordinating activities and resources), management (people management), monitoring (observing and evaluating the activities of the organization) and the standardization of separate processes, can be integrated through common information resources. Managing a distributed organization using remote technologies (see Figure 1) is a big challenge and can involve the risk [Zaskóski (Ed.) 2011] of losing real control over the processes in the company. This applies to both human resource management as well as material resources and information. In the case of remote work, the level of employee value is measured by its competence to act, not by the formal procedure. Nevertheless, we must take into consideration that the value and efficiency is directly related to the possibility of implementing the current and long-term monitoring of the achieved effects. Using the latest technology, one can also closely monitor remote work. What is more important for the organization is that it can include information about contacts and work that was done and the actions taken in the specific situations. Keeping records of such actions could be the basis for creating – regardless of the workers – a valuable knowledge base for the management of the organization.

From the process organization's point of view (with a large territorial dispersion of process implementers) recording should be treated as a function closely associated with the process of monitoring current activities and the collection of transaction data. Thanks to intense internal and external communication through the CRM tool, we can achieve a complete picture of customers' business needs. This flexible and active communication with partners in the market allows for an early response to the risk of frequent fluctuations on the market. This allows both for a quick response to the business needs of the customer (on-line we can change radically our sales strategy) and at the same time makes it available to everyone. The basis of good planning is the ability to generate forecasts, for instance, demand forecasts. Forecast accuracy – without a good database (record) in the OLTP systems and data warehouse (OLAP) – may not be satisfactory. Thus, CRM systems support the rapid flow of information during the implementation of the planning process in different time horizons and facilitate dynamic (parametric) variants of solutions (proposals for planning). As already mentioned, the change is treated as an ability to adjust to the actual situation. CRM systems then allow one to dynamically respond to changes in the company as

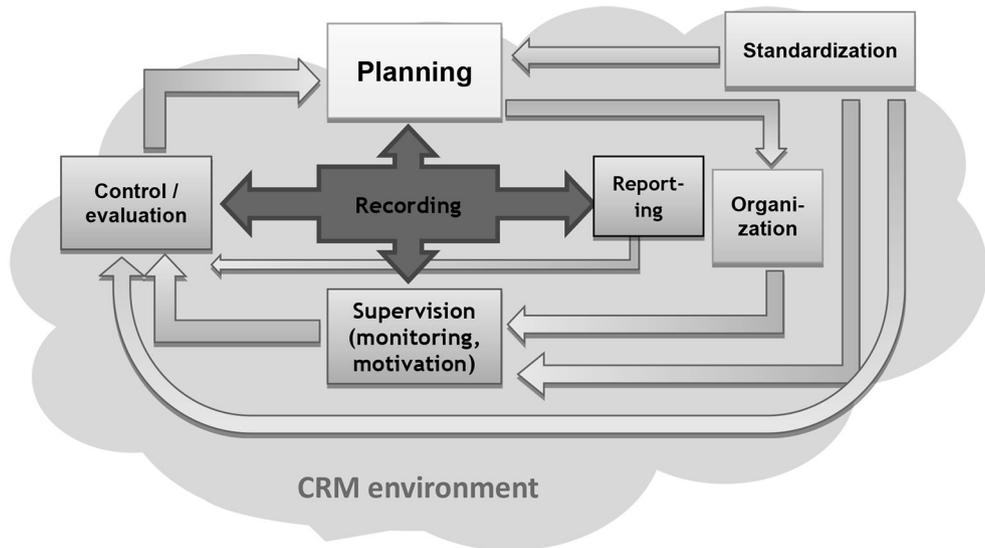


Figure 1. Model management with CRM tools

Source: own elaboration.

well as in its environment. One of the notable features of such systems is their ability to quickly make changes in processes with immediate notification to all interested parties, grouped in the internal or public network. In the CRM, practically just by the configuration and changing business rules, we can quickly change the sales strategy, product range, the target sales group and channels. Based on contacts, the results from one area of activity, by analogy, allow us to create sales in places or channels in which the company so far has not functioned.

The processes of organizing the flow of information and physical resources are the result of the reliability of the action plans. Therefore, flexibility in making management decisions simplifies even the most complex business processes and working procedures. It allows one to respond quickly to shortages of resources by showing both the congested and the unused. CRM systems bring functionality to respond in an on-line mode and make, for instance, changes in the dislocation of individual resources according to the map of business processes. The time from the decision to its rollout and implementation is reduced to a minimum. Additionally, CRM creates in the background a large base of knowledge about processes, customers, employees, goods and all types of relationships between them, which also gives a strong ability to explore the implementers of the processes in the environment of the organization (outsourcing) [Skopiński, Zaskórski 2011]. The reporting function is often used in the current monitoring on the basis of information from systems class OLTP/OLAP, so one can generate reports on the realization of tasks by selected aspects/dimensions. CRM can provide reports on the economic

(efficiency, productivity, efficiency) and technical (reliability, quality) results. This is significant information about statistical scheduling reasons for success, but also for the causes of failures. We can monitor on-line the implementation of any business process, which is reflected in transactional databases.

In present process organizations, standardizing becomes important and operates common standards by distributed entities that interact in the implementation of pre-defined processes. Thus, standardization is a function that uses data stored in warehouses. Due to that, the historical picture of various business events and the whole processes allows multidimensional data analysis and the generation of knowledge about the repeatability of selected occurrences and/or their concentration. This guides us to the simplification and standardization of certain processes, and developing norms for time, cost and performance. At this point, we can already say that CRM systems are becoming a core component of DSS systems (Decision Support Systems).

4. Tools supporting decisions in CRM systems

CRM as an integral component IMIS (OLTP, OLAP, see Figure 3) provides, with the help of BI systems, complex information and supports decision-making at all the levels of business management, or more generally in the planning and implementation of individual business processes. These are the applications based on the network interfaces that allow users to easily make selections of interesting data from one or more sources, and which may involve multiple processes. The Business Intelligence applications include: tools for on-line processing (OLAP), applications for statistics and applications to analyse the links between data (Data Mining) including correlation and cause-effect relationships, etc.

In BI systems one can identify, among others:

- Decision Support System (DSS): a tool that provides information and knowledge necessary for decision-making in organizations by management. These tools use the technology of artificial intelligence, expert systems and operational modeling. The effects of these systems are all kinds of reports and statements that management receives from the EIS.
- Executive Information Systems (EIS), which are often referred to as a specialized form of DSS.

BI systems use all the types of analytical tools and provide access to information to support decision-making based on fact tables, which are a full view of the selected process instead of the so far preferred processes of intuition, experience and fragmentary information. By using tools, such as OLAP, the system behaves differently than the typical (transactional) system OLTP. This difference has several aspects, such as:

- The nature of the CPU load in the data warehouse is different from the loads that occur in typical database systems recording transactions. The main purpose of

the data warehouse is to browse large collections, joining multiple tables, sorting/selecting and aggregation, which means working on multidimensional data structures.

- Data warehouse provides reporting in various modes mainly in an *ad hoc* mode, which means receiving reports that can be defined by date.
- Data warehouse is open for changing an institution's environment, and evolving a business model (new processes) of the company that could quite easily be reflected in the structures of the data warehouse.

CRM systems, by the integration of functional and technological information, allow it to dynamically support the management of the distributed organizations. These organizations, thanks to access to information about various resources, are transformed into virtual organizations which abolish the geographical barriers. Access to information and various services on the "Cloud" computing platform makes each organization an actor/participant of predefined processes. There arises a value-added chain, whose maximization is a function of competence (often expressed by the effectiveness of actions) by actors/implementers of such processes.

5. Service-oriented architecture and cloud computing

The most important feature of technologically sophisticated CRM systems is their ability to integrate. What is essential to this is SOA (Service Oriented Architecture), which allows the integration of "everything" and by "all" [Unhelkar 2008] (see Figure 2). With this approach, the greatest emphasis is placed on defining the services that could operate independently of each other and having a defined interface that provides implemented functionality, called API.⁵ The interface also defines how each service works – ignoring and hiding the way of implementation of technologies – which is irrelevant to the customer. These services are provided to all who speak the Web Service language through a telecommunications network, particularly through the Internet. In order to provide easy access, this has to be a web application.

An employee from anywhere, using basically any tool (with a Web browser with Internet access) can do their business, use the required information resources and manage the organization. New sales processes, marketing campaigns and modifications to existing procedures are performed on-line for all users to whom the process applies. These systems are often implemented in the so-called "Cloud", therefore with the use of information and communications (ICT) virtual infrastructure. Also in the "Cloud", services of those systems are available.

Complemented by an integration layer (e.g. for systems not using the APIs), there are different types of files sharing servers (e.g. ftp) or the integration databases. An essential element of all CRM systems is transactional, central databases maintained in the OLTP systems. The purpose of these databases is to collect all the operational

⁵ Application Programming Interface.

information, not only regarding made transactions, made contacts, realized customer requests, but also about the whole process in all its phases. In order to respond effectively to inflows events to the databases, define the rules of business uses and promote sales in the best possible time and to make management decisions, it is necessary to analyze the data collected by unified metadata. Hence, the need for on-line access to the analytical databases (data warehouse) using the functions of OLAP systems and reports of multidimensional business analysis according to access rights. This is a form of security guarantee and distribution agreed and assigned to user competence. In organizations which require in the access to their full infrastructure greater security (intranet), the solution is Terminal Services. In this case, the physical data are not maintained in the mobile device, workstation or tablet.

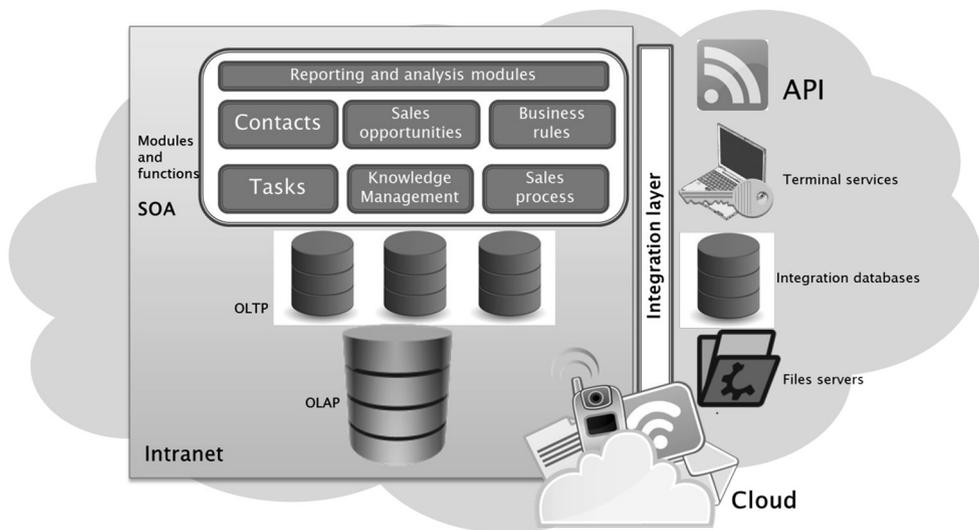


Figure 2. Functional-technological architecture of CRM

Source: own elaboration.

The implementation process of such solutions exposes the possibility of implementing the various modules and components as independent functions. Each has its own integration layer API. With this approach, we can manage the organization by enabling functions at the level of module, task, or a method. The above presented basic properties of the virtually available technical, technological and information resources indicate the possibility of reducing rather expensive IT investments in our organization. This shows the possibility of the virtualization of our company with a purpose to integrate in the wider business processes and information services.

The “Cloud” becomes a service which integrates on different levels access to professional business applications. It gives flexibility of usage and rapid time-to-

value associated with traditional on-demand solutions, combined with security and control solutions. In particular, companies classed as SMEs get a chance to eliminate exclusion from the area of modern information technology (including CRM systems) by access to the ICT infrastructure and related services according to the actual value of the service – dynamically scalable by the needs of any organization (including a distributed and process organization). Reduced IT capital expenditures and operating costs, speedup start-up time. But most cloud computing opens users up to a whole new world of wireless devices, all of which can be used to access any application, which gives mobilization to the organization.

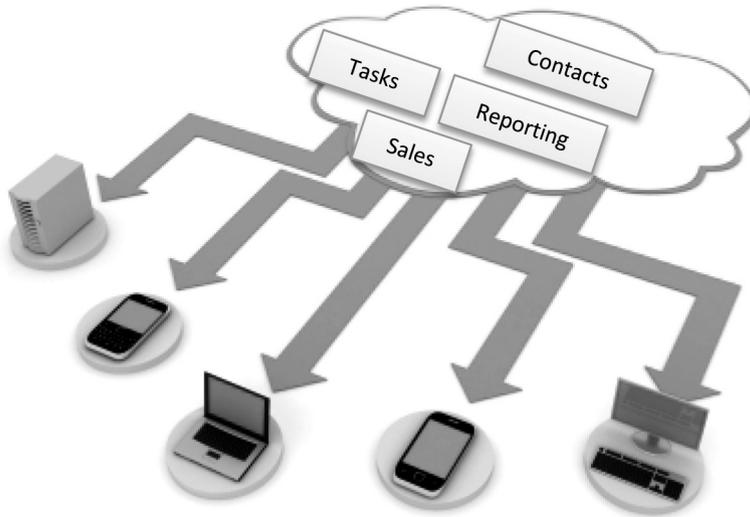


Figure 3. CRM cloud computing

Source: Net Suite's CRM, <http://blog.prolecto.com>.

6. Conclusion

CRM is a tool which allows the achievement of an efficient working organization, able to act effectively despite distractions – of course, provided that it is correctly implemented, integrated and used. It provides additional sales channels (such as call centers, telemarketing, kiosks, customer service remote centers and e-commerce – often cheaper to maintain). All sales channels (even those not belonging to the organization) are based on the product range widely visible in the whole network with the possibility of full interaction [Skopiński, Zaskórski 2011]. Managers of each organization – especially the managers of complex business processes – should use CRM systems as the base of objective knowledge about the processes taking place in their distributed enterprise. It gives the possibility of dedicated sharing information

with the individual implementers/actors in the process. In addition, thanks to SOA architecture, dynamic, efficient integration with the external environment is possible, which is an important source of additional information for the managers. This class of systems provides actual analysis of “what happens” and not “what happened”. They allow in an on-line mode to respond to changing business conditions, and distribute changes, or even entirely new decisions, to all the stakeholders using the mechanisms of incremental database replication. Using BI and OLAP class tools – directly integrated with the functions of CRM – one can make a decision based on facts and not guesswork, premonition or experience.

References

- Grajewski P., *Organizacja procesowa*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2007.
- Griffin R.W., *Podstawy zarządzania organizacjami*, Wydawnictwo Naukowe PWN, Warszawa 1998.
- Januszewski A., *Funkcjonalność informatycznych systemów zarządzania*, Tom I/II, Wydawnictwo Naukowe PWN, Warszawa 2008.
- Skopiński P., Zaskórski P., *CRM warunkiem skutecznego biznesu*, III Ogólnopolska Konferencja Naukowa nt. “Nowoczesne koncepcje i metody zarządzania – w kierunku zarządzania drugiej generacji”, Warszawa 2011.
- Skopiński P., Zaskórski P.: CRM as integration environment of the process organization, [in:] M. Ganzha, L. Maciaszek, M. Paprzycki (Eds.), *Proceedings of the Federated Conference on Computer Science and Information Systems FedCSIS 2012*, Polskie Towarzystwo Informatyczne, IEEE Computer Society Press, Warsaw, Los Alamitos, CA 2012, pp. 1029–1033.
- Unhelkar B., *Mobile Enterprise Architecture: Model and Application*, Cutter Consortium, Executive Reports, March 2008.
- Zaskórski P. (Ed.), *Zarządzanie organizacją w warunkach ryzyka utraty informacyjnej ciągłości działania*, Wydawnictwo Wojskowej Akademii Technicznej, Warszawa 2011.

CRM JAKO SPOSÓB WZROSTU EFEKTYWNOŚCI W ZARZĄDZANIU WIRTUALNĄ ORGANIZACJĄ

Streszczenie: W artykule podjęto próbę identyfikacji systemowych aspektów wykorzystania narzędzi CRM do wzrostu efektywności w zarządzaniu wirtualnymi organizacjami procesowymi. Przedstawiono wymagania i ograniczenia dla wirtualizacji dostępu do zasobów technicznych, technologicznych i informacyjnych w tzw. „chmurze” jako sposób na ograniczenie dróg inwestycji informatycznych, szczególnie w organizacjach klasy MŚP.

Słowa kluczowe: CRM, zarządzanie, rozproszona organizacja procesowa, wirtualizacja, integracja.