Innovative Analysis of a CRM Database using
Online Analytical Processing (OLAP) Technique
in Value Chain Management Approach

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Abstract: In this paper, we emphasize the main capabilities of a CRM software, which integrates three aspects that provide value chain sustainability: operational (marketing and sales automation), collaborative (the relationships between companies’ representatives and customers) and analytical (the opportunity to apply OLAP technique on CRM system variables).

The multidimensional analysis applied to the information gathered on CRM database provides a real support in view to make an efficient decision by the managers that are responsible for the business development, centered on profitable customers. The OLAP technique emphasizes the interdependences between the different variables of CRM system in order to value the information about customers, which represents the “digital gold” in the e-business approach.

Keywords: CRM, online analytical processing, information and communication technologies, branding, logistics

1. Connecting CRM systems to branding strategies

The value brought by the customers to the companies differs according to the specific of the business relations developed with them. In order to quantify the customers’ profitability, the performing companies have created and developed information systems of CRM focused on the value of the data warehouses which stock a large amount of information collected as a result of the interaction with the customers during the stages of their life cycle. Due to the flows of information, the software designed for CRM, adaptable to each company’s specific, allows the analysis of the information related to customers and the identification of the clients segments according to the profitability they generate; at the same time, it presents communication abilities with the customers in real time, ensuring a high receptivity of the companies’ needs and the customers’ requirements.

CRM systems record customer preferences and histories but are often isolated in one part of a company. By strategically linking CRM systems to branding strategies, companies can pass valuable sales or service data to the right customer. The brands achieve competitive advantage by reinforcing sustainable emotional bonds with target consumers who are aligned with their distinctive positioning. These bonds are taking on new importance as consumers exert unprecedented control over CRM interaction and as categories become increasingly fragmented.

Based on great amounts of advertising expenses on all types of markets, brands have looked toward alternative methods of targeting customers. CRM is one route that brands use in order to increase consumers’ expenses. The CRM managers need not to only analyze customer spend by product, but across the whole product/service range in order to manage revenue effectively. Customer centricity enables businesses to think not only about product profitability but also about customer value, and to develop brand extensions strategies connected to customer value management models that are designed to appeal to their best customers. With the most profitable informing the brand extension strategy, the success chances are greater in the e-business environment.

In our opinion, the branding strategies must be connected to the following CRM activities:

- Identifying key customers targets and their needs in order to realize the best offer positioning;
- Defining the brand architecture and core value propositions to customers;
- Aligning brand assets to the organizational culture in view to reinforce brand promise at every contact point with customers;
- Developing innovation programs that expand brand relevance and impact;
- Creating effective, target-specific brand communications and personalized marketing programs.

A well implemented branding concept relied on a successfully CRM strategy can focus a product or a
service as being the best on its market target by capitalizing its competitive advantage or an absolute innovation in its industry. Putting the branding strategy in the core of a business helps the CRM specialists understand how to extend and manage their brand, how to prioritize their product line and how to structure their organization for delivering satisfaction to all the customers.

The information systems designed for CRM must answer the informational needs of the project managers, so that they can take the most efficient decisions referring to the acquisition of new customers and the development of branding strategies.

The design of the CRM information systems in value chain management approach must be based on the following characteristics:

- **The top–management involvement** – supposes a business philosophy centred on customers and a general manager that should have a strategic vision on the information systems and their role in the increase of the business processes efficiency, especially those which serve directly the customers;
- **The focus only on the real needs of customers** – involves the knowledge of the selection and analysis procedures of the information referring to the customers within the data deposits;
- **The availability of the data sources** – before the implementation of an information system, the CRM project manager must make sure of the existence of some multidimensional data bases, in which there are stocked large amounts of information derived from the potential or actual customers;
- **High flexibility** – while the information needs of the CRM project managers evolve and change in time;
- **Possibilities of continuous up- to- date** – an information system designed for CRM can’t be exploited without having some permanent accomplishments to satisfy the changes in the business environment in which the company is involved.

2. The definition of the design specifications and implementation of the CRM information system functions

The CRM software that we created and developed is designed for small and medium companies and has as a purpose the customers and their sales management on a certain period of time. These data represent the basis for generating some cubes that will allow the carrying out of some multidimensional analyses on the sales using the OLAP technology (On Line Analytical Processing). The information resulted from these analyses represents a real support for the marketing managers of the organizations, responsible for the strategies oriented towards the complete satisfaction of customers.

The main characteristic of this information program is its **personalization capacity**, according to the concrete situations at the companies’ level; thus, we considered appropriate to offer our users the possibility to configure the products categories, the offers, the information referring to the customers, necessary for the development of the CRM projects. The CRM application was developed using the Borland Delphi 7 technology and for the data stocking there was used an operational database with Paradox 7 type charts. In order to generate the data cube, a SQL Server 2000 relational database was used, which was previously completed with data from the operational database. This functionality was implemented within the CRM application by means of a transfer function. In order to generate the enthusiasm and implicitly, the customers loyalty, every organization must efficiently manage a data basis of opt-in type, that ensures the application of the marketing concept based on permission, according to which there is the previous agreement of the potential or effective customers to dispose personal information to the companies, so that they could send them personalized offers according to the preferences expressed by them. The information stocked in the databases (obtained by means of the direct contacts with the sales representatives, as a result of some marketing researches, registrations on the companies’ websites, etc) allow a division of the customers’ portfolio, the determination of a customer profile and an efficient position of the offers on the market. The CRM information program offers to its users a way of sending personalized e-mails to the persons included in the databases in order to facilitate the on-line communication with the customers.

The main **functions** of the CRM information system that makes it original from other systems of the same type by the approach manner are:

- **the processing of the transactions carried out by customers**, the customers’ invoices being registered in the system’s data basis; this function is found in most of the information programs designed for CRM;
- **the on-line communication with customers**, the CRM managers having the opportunity to send newsletters or any other kind of marketing messages to the customers:
- **the promotion and loyalty programs management**, in function of the number of fidelity points determined for each customer on the basis of the algorithm implemented in the software; we offer to the users of this application the option that allows to allocate special offers for predefined points levels;
• **the multidimensional analysis of the sales**, based on different segmentation criteria (product type, occupation, sex, revenue level, etc.).

We appreciate that our CRM software offers the capacity to **provide value chain sustainability as it integrates brand, design and logistics**: in this way, we applied it to a company which its main activity domain consists of clothes’ production and selling; the software allows the introduction of company’s brands and the design of each product and the multidimensional analysis of sales provides information for logistics department in order to guarantee the products’ availability in the points of sale and customers’ satisfaction.

The evaluation of the CRM software functions was performed by gathering in the application a sample of products, customers and sales and their transfer in Microsoft SQL Server in view to realize a multidimensional analysis based on OLAP technique.

### 3. The application of OLAP technique for the multidimensional analysis in the CRM system and its integration with logistics

One of the multidimensional analysis that can be performed by the means of the information transferred in SQL Server database consists of the sales allocation on personalized products, in function of different segmentation criteria. In this way, marketing managers can identify exactly the products positioning when they develop customer value management strategies.

The data transfer from the operational database integrated in the CRM software to SQL Server offers the possibility to view the tables diagram, accessing Enterprise Manager option (figure no. 1).

![SQL Server Enterprise Manager](image)

**Fig.1 – The visualization of network diagrams between CRM application tables**

The multidimensional analysis can be realized using a Pivot Table from Microsoft EXCEL, in which we import an external data source - the operational database from CRM software. The analysis using OLAP technique is facilitated by the creation of a cube with SQL Server functions.

The sales analysis based on two segmentation criteria (the education level and the intervals of customers’ age) is revealed by the OLAP cube generated by Microsoft SQL Query Analyzer using the following script (figure no. 2).

The **analysis dimensions** are the products categories, the products names, the intervals of customers’ age and their education level, while the **analysis measure** is the sum of all invoices’ values inserted in the database. The pivot table opened in Excel sheet allows a lot of analysis for the entire values domain of the dimensions or selecting several values, in function of the user’s specifications.
Fig. 2 – The SQL script configuration in view to generate the cube for sales multidimensional analysis in function of specified criteria (the education level and the intervals of customers’ age)

After launching in execution the query presented in the figure no. 2, the wizard of Microsoft Query allows the option to link the cube dimensions by transferring them in the OLAP analysis module and requires the configuration of the analysis measure - the sum of all invoices’ values. (figure no. 3 and figure no. 4)

Fig. 3 – The selection of the pivot table from data cube

Returning to the Excel sheet, we can distribute the cube dimensions on rows and columns, taking into account the fact that the pivot field (the sum of all invoices’ values) must be distributed into Data Area, determining the dissemination of the sales on four aggregated dimensions (the products’ categories, the products’ names, the intervals of customers’ age and their education level) (figure no. 5)
The goals and decisions from logistics domain are close related to CRM objectives, both from the aspect of customers’ expectations and needs satisfaction and from the perspective of customers’ profitability. The accomplishment of the CRM goals imposes the existence of a logistic system that is able to offer time and place utilities wanted by the customers.

Our CRM software provides a unique database that gathers information about products, customers, leads, personalized offers and invoices helping the processes of sales force automation and the quick search of information about sales analysis, the visualization of sales reports on each brand and product, offering a fast response to the requests of Logistics Department of a company.

We consider that the CRM system that we developed can be used in integration with logistics as it emphasizes personalized sales reports for each product and brand and in this way the specialists from Logistics Department can observe in real time the availability of products to the distributors’ level.
Conclusions
In the context of Value chain management approach, the companies must use in an optimal combination all the communication channels with customers: the dealers, the customer care services, the web portals and other CRM techniques, in order to assure the customers’ satisfaction. The performing companies are focused on three strategic priorities: the increase of customers’ life cycle, the increase of the average expenditure for each customer and the decrease of costs associated to customers’ acquisition using the new information and communication technologies.
We consider that the multidimensional analysis applied to the information gathered in the SQL Server database provides a real support for the managers responsible for the business development focalized on profitable customers, in the constraints imposed by the principles of Value chain management. The OLAP technique that we simulated emphasizes the interdependences between the different variables of a CRM system, focusing on the promotion of the customer value.
The complex CRM techniques integrated in Value chain management approach includes: human resources with adequate background (technical assistance and customer care representatives, marketing specialists, CRM database administrator), Internet based applications that allow the information management in a CRM database, documents flows that cover all the technical and functional features of the CRM systems, in order to offer flexibility and the quick integration capacity in the e-business.

References: