A Product/Customer Profitability System Based on a Data Warehouse

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I. The Bank

Bank Rozwoju Eksportu SA has been funded in 1986 and has grown rapidly since the privatisation in 1992. Bank's shares are listed at The Warsaw Stock Exchange, 21 % of shares are held by Commerzbank AG. The bank is on the way of quick development being one of the leaders of the Polish money market. The figures below show the year-to-year dynamic of growth:

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<tbody>
<tr>
<td>gross profit</td>
<td>173,084,2</td>
<td>94,075,4</td>
</tr>
<tr>
<td>net profit</td>
<td>105,360,7</td>
<td>53,451,8</td>
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<tr>
<td>total assets</td>
<td>2,585,625,9</td>
<td>1,413,103,9</td>
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<tr>
<td>own funds</td>
<td>317,265,6</td>
<td>229,625,8</td>
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all figures in thousand's PLN

BRE SA is a commercial bank aiming its activity at big and medium Corporate clients. One of the main areas of interest are foreign trade transactions - BRE has a 10 % share of the market. The bank is providing a broad range of modern banking products - including electronic banking, the actual market share is 60 % (as far as remote settlement and payments are concerned).

BRE SA has twelve domestic branches connected by telecommunication links allowing the integrated accounting system to work in the on-line mode, enabling the real-time transfer of money between the branches. The telecommunication network is used to transfer information to our databases and business applications and e-mail data as well.
II. The Management Information System

1. MIS - definition, the BRE approach

Bank Rozwoju Eksportu SA as other banking institutions must balance the risk implemented in any financial activity with a profitability level deserved by the shareholders. The objective to rich is the increase of the equity value. Any decision taken by the management must be funded on factors, numbers and analysis. That is why BRE adopted the following approach to MIS:

"The Management Information System is a system developed by an enterprise to capture all the information (accounting and otherwise) required by management to run the business as efficiently as possible."

Therefore, from the business point of view our MIS is a source of information on bank's transactions and balances, on the money market events and index, on main economical factors and ratios. At the same time it includes descriptions of all methods, techniques and tools for data analysis and processing. All procedures and schemes that apply to the way information is gathered, kept and distributed in our Bank is included. The need of information is not purely a management problem - it is clearly a business issue. Taking decisions on proper data enables to reveal opportunities and to avoid endangering the company's existence. It is a necessity not just a need.

2. Functionality of MIS

If we take into consideration banking risk and outcome maximisation, MIS may be divided in two functionally different parts (but related to each other by the information content) that include:

risk management - data and analysis dedicated to risk measurement. The information is used to deal with four main types of banking risk:

- credit risk
- liquidity risk
- interest rate risk
- currency risk

profitability analysis (including the cost analysis) comprising information on profitability by different breakdowns, for example by different products, customer types etc.

From the technical point of view, MIS does deliver a consistent and accurate database, flexible tools for data retrieval, processing and presentation. Standard reporting facilities and ad-hoc inquiry tools are available. Adopting the Data
Warehouse approach we can divide the MIS (or better MIS Data Warehouse) into five elements:

- database
- metabase
- procedures for data updating and evaluation
- end-user applications
- warehouse administration and development tools

Information integrated in the MIS database are gathered from different sources. The prime data source is the integrated accounting system (IBS-90) and the trade finance system (ICOBS). The other sources are local applications working in several different environments (for example: dBase, Microsoft Access, Microsoft Excel, SQL Server, etc.).

3. The structure of MIS in BRE SA

A little simplified structure of MIS existing in our Bank and data exchange might be presented like this:

![Diagram of MIS structure](image)

We are confident that the idea of Data Warehouse is the right way to construct an effective MIS. The system is built of five elements each one of them being a Data Warehouse. They include separate metabase, job scheduler, store with aggregated and historical data (both subject-oriented), certain processing procedures and a standard reporting stores (either text and graphic) located in Briefing Books.
**Corporate Data Warehouse** - it is the main part of the system, its objectives are:

- gather and collect data from banking systems and external sources
- standarize, control, validate data
- aggregate data and build time-series etc.
- generate reports (with a frequency requested by the users and on a certain aggregation level) and send them directly to the users in head-office and branches
- prepare data for the four Secondary Data Warehouses
- maintain the central metabase
- management of the off-line stored historical data

**Secondary Data Warehouses** - there are four of them currently working in BRE SA:

- Loan Administration Database and Reporting Module
- Liquidity & Cash Flow Analysis Module
- Cost Analysis Module
- Profitability on Customer & Product Module (PCPM)

These are applications which are designed to fulfill following objectives:

- update the information in Corporate Data Warehouse with subject-oriented information, aggregated and structured as time-series data
- create standard reports and send them to users in head-office and branches
- maintenance of the metabase to deliver to the end-users information data available and their aggregation level
- process data and deliver them to the end-users (analysts, middle and top management) to enable ad-hoc queries, analysis and reporting
- automatically send data to the local workstations where EIS facilities are used

The MIS system is implemented as a central system on a VAX machine in the head-office. The data are shared to be used on local MsWindows workstations that are working in a client/server architecture.

**4. Loan Administration Module**

Loan Administration Module is dedicated to gather and process information related to the loan area. It is the database for the loan portfolio risk management comprising information on all credit risk related products, for example: commercial loans, guarantees, letters of credit etc. It is purely a credit risk management supporting system.
5. Liquidity & Cash Flow Analysis Module

The Liquidity & Cash Flow Analysis Module is designed to support the liquidity management of the Bank. It is build of two main parts:

- liquidity analysis - that is a balance based analysis including undrawn commitments and adjusted according to rules appointed

- cash-flow analysis - that takes into consideration all cash flows generated by transactions held in Bank's books, the analyst may adjust the data according to rules appointed in the Bank.

6. Cost Analysis Module

The mentioned part of the MIS is designed to gather all cost information of the bank, data on direct and indirect costs, overhead costs etc. The application includes the cost centre accounting system that allocates the costs to appropriate organisational units (cost centres) and than to adequate products (cost units). The purpose of this part of the system is to serve as a support to the budgeting, cost and performance evaluation. It is a support for the controlling services in the bank aimed to increase the overall performance by decreasing costs.

III. Profitability on Customer & Product

1. Functionality of The Profitability on Customer & Product Module

The PCPM has been designed to deliver information about the profitability on products and customers to following groups of users:

- bank's management
- managers of appropriate departments and branches
- account managers

Thanks to this part of MIS our Bank is able to verify the policy concerning the sale of products and customers. The tools are the tables and reports including income and cost data related to each product and client. The system comprises information upon which the management has a clear view on the products preferred by customers, on cross-selling of various products, on the actual profit on certain groups of customers, etc. The analysis point to customers having significant relations with the Bank hence enables to formulate proper future objectives and evaluate current activity.

The purpose of the module is to support decisions on two levels:

strategic
• formulate goals and objectives on the bank's level
• control of performance

that in this particular area means:

• evaluating profitability on each banking product
• evaluating sale of group of products to particular group of customers
• evaluation of effectivity (sale results) of each branch, division and account manager

operational

• formulating goals and objectives on the branch (operational) level
• control of performance on the branch level

that is:

• defining sales objectives on the customer and product level
• evaluating activity of particular customers
• evaluating the volume, turnover and profitability on each product

2. Standard reporting module and EIS facility

Standard reporting module

This module is to deliver standard reports required by the users. There are three main types of reports:

• rankings by volumes of sales, profits and numbers of transactions
• summaries on volume, profit and number of transactions
• forecasts of sales and profits

The profitability (or any other analytical) breakdowns can be observed on customer, customer group, product, product group, branch or account manager levels, depending on the users' demands.

Sample reports:

• Account managers ranking by profit on products sold
• Summary report on profit, turnover and number of products on trade finance transactions
• Forecast of product sales to customer target group, etc.

The main report encompasses all turnover and profitability information on each, single customer (but may be prepared on the branch or bank level as well). It is designed in a way to provide comparable information on the current and previous analytical period, being the base for time series analysis, hence prognosis might be
fomulated. The information included in the Main Standard report relate to each customer and each product.

These are following observations included in the Main Standard Report.

- average balances on current accounts
- average utilisation of overdraft credits
- average utilisation of loans
- average deposit balance
- turnover on each product
- number of transaction of each product type
- percentage change of number o transaction against last month
- interest accrued on customer loans
- interest accrued on customer deposits
- internal cost of funds based on transfer prices
- net result on deposits
- net result on loans
- standard transaction costs\(^1\)
- net results on transactions
- results on each product type
- overall profit or loss on customer

**EIS - cross-selling analysis**

The EIS is dedicated to deliver to the management of the Bank the information on product and customer profitability by several different breakdowns (customised by the user) and to visualise data in the process of decision taking. The program includes summaries and time series analysis as well. The breakdowns offered by the module are:

- product level
- branch level
- customer group level

The time series analyses include comparison of average values of analysed variables in three months (on the rolling basis) and twelve months' periods. Longer analytical periods will be available when historical database update will be finished.

The program is easy to operate. It uses the point and click and drill down methods to reveal subsequent screens and reports. Data are presented in tabular formats, and on demand as graphs (pie or line charts - when appropriate).

The application is dedicated to the management user on the branch level and head office.

**IV. The Development of MIS and PCPM**

\(^1\) the standard cost figures are delivered by another part of MIS - the previously mentioned Cost Analysis Module
Further development will focus on integrating with MIS the Money Management System, application run currently in the Treasury Department. The application is dedicated to risk management support (the system was presented at SEUGI 95 in Stockholm). It comprises of the reporting module, on-screen info module and forecasting module - all three are anchored to system's own database. Next step will be related to the enhancement of system capability and technical efficiency to avoid in the future problems with data volume processing.