PRACTICAL ASPECTS OF THE USE OF THE CENTRAL MANAGEMENT INFORMATION SYSTEM FOR MANAGEMENT BY OBJECTIVES IN A LARGE UNIVERSAL COMMERCIAL BANK

ZDZISŁAW ODRZYGÓŻDż a), WIESŁAW SZCZESNY b)

a) Faculty of Mathematics and Information Science, Warsaw University of Technology
b) Department of Informatics, Warsaw University of Life Sciences (SGGW)

Every large organization has problems coordinating the activities of all the employees. We study the practical aspects of using a main Management Information System, called MIS, to enable management by objectives. This method called MBO can be applied for a large audience, including the widely understood management of a company and consultants (sellers) whose job involves direct contact with customers. This paper presents a study of the phases of determining the specific sets of tasks for the financial year and the principles of their normalization (standardization). We discuss the necessary functionality of the MIS (or precisely - the applications which support the MBO process), which enables participants of the MBO process to create and maintain a list of task definitions at every level of the organization structure of a company.

Keywords: E-business, Business Intelligence, Management Information Systems

1. Introduction

Today's large, multinational financial corporations have a Management Information Systems (MIS), that is used within an organization to support decision making at all levels. In this paper we present some extensions to a typical MIS that aim to improve MBO implementation (the System of Management by Objectives)
for a wide range of key employees. The discussed proposals, based on “best practices”, take into account both the bank's business model and its routine management processes. However, our way of describing the issue is sufficiently general that it could also apply to any universal commercial bank. An additional goal of this work is to draw attention to the fact, that the last factor impartially confirming the effectiveness of the implementation should be referring to the financial results achieved by the organization that has effected such an implementation. It is relatively easy in the case of companies listed on the Warsaw Stock Exchange, because they publish their results and often boast about selected implementations in communications to investors.

Let us remind the reader that according to the classical approach to management the following reasons for the implementation of MIS for management support can be identified (see [6], [9], [14]):

- provides uniform and comprehensible information to all managers within an organization;
- improves the definition and planning of objectives at both the strategic and operational levels;
- helps to create a system of budgeting and monitoring, which can have a direct impact on the employee's motivation and at the same time provides a powerful performance monitoring tool;
- improves data analysis to enhance the effectiveness and efficiency of the organization management;
- helps to determine the variable part of remuneration depending on the work performance results of individual employees.

The idea of Management by Objectives (MBO) was developed by Peter Drucker in 1954 and published in "The Practice of Management" (see [3]). In 1965, George S. Odiorne completed a textbook entitled, “Management by Objective”. Odiorne's concept of management by objective is based on several premises. One of the major premises establishes that the appraisal of managerial performance is not an activity autonomous from other activities of the firm. Over the years, the concept of MBO has been variously described, evolved, and modified by analysts of different schools of thought (see [4], [5], [6]). However, generally the main message has not changed, namely the effective management should be guided by the vision and effort of the entire management team towards a common goal or aim for continuous improvement of the efficiency of the wider management and consequently the entire staff in the corporation. As a result, the MBO system,
if properly implemented, permeates the entire organization and allows individual employees to focus on actions crucial from the perspective of a large corporation as a whole.

A correctly implemented MBO provides a powerful framework for:

- articulating expectations to the individual worker and their enforcement;
- optimizing of the organizational structure, as areas of responsibility will become more precisely defined and actually observed;
- providing effective support for the managers in solving the difficult problem of delegation of duties;
- ensuring effective monitoring procedures for the achievement of the defined objectives to allow correction and improvement of the work quality of individual employees;
- ensuring fair employee evaluation based on objective criteria and consequently improving the effectiveness of rewarding and promoting.

The structure of the MIS system can be very complicated and implemented in different technologies. Increasingly, MIS is considered as an Unified Platform for Integrating Internal Business Units, operations with Customers and the classical MIS based on a data warehouse.

Omitting technical details and feedback related to the Information Movement and Communication MIS can be schematically presented in the Fig. 1.

After the implementation of MIS the organization has a powerful tool to support the budget and monitoring process of the organizational units involved in this process. MIS contributes:

- to increase competitiveness and effectiveness of managers in the decision-making process and solving of different problems which appear in managing an organization;
- to provide effective and uniform procedures for budget planning and monitoring as well as financial reporting;
- to improve analysis that can help management increase efficiency;
- to help link the variable part of an individual’s salary with the achieved results;
- to improve employee involvement in the budget process – defining and implementation of the budget targets, so that employees better understand their participation in the results achieved by the entire organization.
II. Processes that create detailed information structures

The structures contain uniform information divided into areas and periods with fixed frequency.

the area of: finance, marketing, risk, sales, logistics, service processes
period: 10 years, 5 years, year, quarter, month, week
frequency: year, quarter, month, week, day,

III. Data warehouse repository

A database warehouse is one large Data Repository of all business related information including all historical data of the business organization, can support web or text mining in order to leverage data and transform or aggregate them into useful information.

IV. Data marts

A data mart is a repository of data gathered from operational data and other sources that is designed to serve a specific group of employees of a corporation.

DM1 DM2 DMn

V. Processes of information sharing

static reports dynamic reports reports generated by the BI

Figure 1. Traditional MIS architecture

2. How to achieve the optimal implementation of the MIS system

A typical MIS is the system of providing information to people who make choices about the disposition of valuable resources in a timely, accurate, and complete manner at a minimum of cognitive and economic cost for acquisition, pro-
cessing, storage, and retrieval. Moreover most of it is restricted to the enlarged financial perspective. However, most international financial institutions have implemented the MIS tools in the form of CRM (and / or ISO9001) and Balanced Scorecard (BSC) for each business unit.

The balanced scorecard is an evaluation tool that covers four essential perspectives: financial, customer, internal process, and learning and growth.

However, the MBO system goes much further than MIS, because of focusing on the objectives / tasks for individuals (in organizational units). The concept of the unified Balanced Scorecard for processes and activities has been discussed in numerous articles and books. This method could be cascaded not on the functional structure of the organization but on processes and activities. Due to bottom up orientation there can be noticed different aspects (important from the strategy point of view) which could not be seen using only the top down approach (interesting presentation of this idea together with the case study can be found in the works [7], [8] and [9]).

This means that the successful implementation of MBO results requires, in principle, that the cascaded BSC should be applied to processes (and subprocesses) and actions. By contrast, operational control and continuous improvement of processes and activities are much more important to a large bank than dealing with the organizational structure.

However, this means that the rights and responsibilities in relationships in a large commercial bank are complex and can not be described in terms of one hierarchical structure (there is a need to develop many structures reflecting these relationships).

Therefore, in large organizations (companies) the responsibility structures are added in addition to the organizational structures. These structures are much more complex and describe the major areas of an employee’s job or position and include comprehensive job descriptions as well as conditions of the individual Contract of Employment and the Bonus payment conditions.

Therefore, it is necessary to add the following features to the typical MIS:

- introduction of standard indicators covering the financial and non-financial aspects of activity and making their detailed definitions (so-called blue book) available to the MBO participants (note holders);
- implementation of a calculation engine for the adopted set of indicators, which generally do not aggregate up;
- KPI (Key Performance Indicators) monitoring of various activities according to established structures of responsibility;
- Implementation of an engine intended to calculate complex KPI’s (so-called dots calculation);
- The implementation of the so-called appeal procedures for each KPI.
Furthermore, it is necessary to maintain historical information. Classical MIS gathers standardized information for a specified period (2-5 years) based on the current business model. Generally, the business model is improved each year (annual changes include some historical information of the previous year). However, MBO participants (note holders) should have access to the data from the previous year according to the old model. This will allow them to appeal against the settlements of MBO notes. Furthermore, in December of the same year, they should have historical information for the current year according to the current model. In addition, it should be possible to implement KPI line forecast for December 31 for all participants (several thousand) at different levels within the hierarchy of responsibility. These forecasts are prepared in 3 scenarios: pessimistic, expected, and optimistic.

In addition to the current value of KPI, MBO participants receive information about the expected end-year performance, (the value of the synthetic index is calculated for each note in points). The three scenarios (sometimes a greater number is generated) allow employees better estimation of the amount of reserves to be created in each quarter for the payment of bonuses, which is done in the second quarter of the following year.

In conclusion, new MBO rules require significant changes in software procedures presented in Figure 1 and internal processes in MIS.

3. Key participants in the MBO process and their role

A central unit, often called the MIS Data Management Department, plays a key role in the process of creation, management, and sharing information.

It carries out its functions through cooperation with the IT and Finance divisions and units involved in controlling individual organizational divisions (business lines and support lines). The heads of the HR and Finance departments are the natural owners of the MBO process, which is usually coordinated centrally by a designated coordinator. A special MBO unit in the finance department is responsible for the technical implementation of the process of designation of tasks, monitoring, and annual assessment of task achievement.

Its primary role, shared with the HR and Compliance Departments, to coordinate the process of determining the tasks for all participants in accordance with the current strategy and annual budget. Its responsibilities include issuing notes to individual participants and ensuring their monitoring on a monthly basis and year-end accountability. To make this possible, this special organizational unit cooperates closely with the controlling units that support the process of setting a series of sets of tasks in their business lines. The responsibilities of this unit, with the sup-
port of other units of the Finance and Compliance Departments, also include issuing opinions on the proposed set of KPIs (together with their weights and standards) in terms of compatibility with the budget and strategy and their transparent accountability. The process of issuing opinions is about verifying that the probability of the scenario, that at least 80% of the MBO participants complete their tasks at a satisfactory level while the Bank does not achieve the budget objectives, is very low. This analysis obviously requires adequate resources and support by the Department of Data Management (DMD). And this is why a dedicated MBO unit should cooperate very closely with the DMD in supplying necessary data for analysis as well as in the further development of MIS.

Active participation in setting ambitious but realistic tasks on the line supervisor-subordinate is a critical key to successful MBO and MIS concept implementation. The MBO participants must have access to indispensable and reliable information. It can be delivered only by a centrally coordinated MIS. It is a very challenging task for the DMD department that must keep up with changes in the bank.

4. Cumulative result assessment in the center of responsibility

A synthetic index that translates the results into numerical values on a fixed scale is needed to evaluate the completion of the tasks and translate them into the annual bonus. Usually, to calculate an overall performance score for an objective KPI, Point Engine computes a normalized, weighted average according to the weight described in the note. Normalization converts individual KPI values to a common scale, and makes it possible to obtain a synthetic indicator for a group of KPIs. The literature provides many techniques for normalization (see, e.g. [10], [11], [12]). They are useful for comparing different units to each other, for example in terms of efficiency, profitability, etc., and they can be used for example to allocate bonuses from the bonus fund, the total amount of which is determined in an aggregated form. The case of MBO objectives, it is not so much about normalization as about the assessment of the result against the established standards, i.e. translation of the resulting value of the KPI to a point scale, not necessarily using an injective function. The idea is that participants should focus on achieving their own objectives as close as possible to the agreed level. Very often functions of assessing the performance of tasks for various quantitative KPIs (i.e. those with values on the interval scale) are defined using three parameters: \(a\), \(b\) and \(c\), \((a < b < c)\). The default values of the parameters are: 80, 100 and 120 points, respectively.
For example, we could define a function using the following formulas:

\[
f(x) = \begin{cases} 
0 & \text{for } x < a \\
80 + \frac{(x-a)}{(b-a)} & \text{for } a \leq x < b \\
100 + \frac{(x-b)}{(c-b)} & \text{for } b \leq x < c \\
120 & \text{for } x \geq c 
\end{cases}
\]

\[
g(x) = \begin{cases} 
0 & \text{for } x < a \\
80 & \text{for } a \leq x < b \\
100 & \text{for } b \leq x < c \\
120 & \text{for } x \geq c 
\end{cases}
\]

(1)

Of course, such functions are used when the KPI is a stimulant (e.g., income, sales, volume of deposits, etc.). In the case of destimuli (e.g., operating costs) an accordingly modified formula is used. Some indicators (KPI) are qualitative, not based on some metrics, i.e., they are not directly measurable. In such cases, the performance evaluation is carried out by the immediate supervisor. The supervisor, based on a properly prepared report, evaluates the employee's work performance using rate points with values in the range [80, 120]. The total score of the responsibility center for which the note was issued is given by the following formula:

\[
W = \begin{cases} 
\sum_{i=1}^{k} w_i X_i + w_k X_k & \text{if } \sum_{i=1}^{k} w_i X_i \geq 80, \\
0 & \text{if } \sum_{i=1}^{k} w_i X_i < 80 
\end{cases}
\]

(2)

where \(k\) is the number of KPIs in the note, \((i = 1, ..., k, \ w_1 + ... + w_k = 1)\) and \(X_i (i = 1, ..., k)\) is a point for the \(i\)-th KPI.

The value of the synthetic index \(W\), can be calculated through the given formula and translated to the value of the annual bonus that is paid according to a fixed algorithm.

5. Calculation and management module for MBO notes

The Application which is dedicated to supporting the MBO process should be a fully integrated solution with the central MIS system. Ideally, it should be one of many processes inside the MIS. Typically, in the first phase of MBO implementation it is usually a separate application that runs in reduced functionality mode and only supports the process of calculating and managing MBO contracts. A typical initial solution scheme is shown in Figure 2. The presented solution usually comprises three main components:

- The KPI engine to calculate indicators for each selected responsibility center, main repository to hold the data with low-level metric values of all the individual components. This solution allows MOB participants to track changes at the detailed level.
- A Contract Management module that contains three small engines: Points Engine used to convert results to 120 points scale, Bonus Engine used to calculate the annual bonus payable, Contract Engine used to generate pdf documents and to monitor and to account for individual contracts;
- Interactive layer of the presentation - user interfaces (typically in the first phase of the implementation of the MBO system these are simplified solutions based on basic office tools).

Figure 2. General formulation and a solution scheme for MBO and MIS

Of course, in the initial phase of the MBO implementation, the application (actually its advanced prototype) usually – as is shown in Figure 1 - can access corporate data not only from a central repository of MIS, but from various other local repositories (e.g. HR repository, Business Control repository). This makes it necessary for the MBO module to have its own repository of all data, including definitions and standards of individual KPIs and the values of indicators that are used in monthly monitoring and annual settlement of contracts.

Thus, in the first years of implementation, MBO participants (note holders) receive monitoring notes with fairly long delays after the end of each month (including only the KPI values for a given reporting period). Therefore, they are not able to check whether a particular transaction was included in the monthly settlement. A similar situation occurs at the time of the annual settlement. This can be considered as a big weakness of the MBO system, especially by managers / line workers who often collect selected data for the purpose of subsequent verification of the settlement.

Therefore, a successful implementation of the MBO system requires full integration with the corporate MIS, without the need of intermediate data repositories
and additional synchronization of data. This, of course, may require major changes to the existing corporate MIS, most of which are described in Section 2. However, to ensure full support to MBO participants, in addition to reviewing the monthly monitored notes in the information HR kiosk, every note holder should see the effects of his/her daily work on the value of KPI indicators (at the lowest level of aggregation down to individual transactions). Only the achievement of such an advanced implementation level allows to obtain the full benefits of MBO in a large financial institution.

This functionality, based on the tools delivered by SAS Institute Poland, a division of SAS Institute Inc. USA, is built by a group of commercial banks. One of the banks, which began cooperating with this division in the mid-nineties is Pekao Bank.

6. Conclusion

The MIS system designers face difficulties, because most of the banks are reluctant to provide information of the implementation of MIS. The Bank's management believes it has a competitive advantage in the market thanks to the use of such tools. Thus, there is little information in the literature which looks at the financial impact of implementing advanced MIS systems and advanced systems of remuneration. There are only selected results of case studies presented by young scholars or even dry press releases (see [1] and [12]). More information about the implementation of a management information system in an organization can be obtained at conferences organized by vendors of IT tools and by consulting firms. Unfortunately, this information is often prepared for marketing purposes and it is nearly impossible to verify independently. However, based for instance on SAS Users Conference reports, it can be assumed that since the year 2000 most banks began to gradually implement software for managing and improving remuneration systems. One of these projects is the implementation of MIS and MBO systems. The MBO has different variations, because the pure form has had many opponents over the years, the most famous of which has been prof. Edwards Deming (see [2]). Implementation of MBO system modules in a corporate MIS is an important aspect of the practical use of MIS in the classical approach to this subject. Independent measurement of the effectiveness of such an implementation can be done using some analytic approximations based on publicly available financial statements.

In the description section of such financial statements, in addition to efficiency indicators, one can find useful information about management. Pekao S.A. Bank is one of the banks that properly implemented both MBO and remuneration systems at the beginning of the twenty-first century. It was done utilizing the previously implemented MIS. Figure 3 shows changes of the three main indicators of efficiency for the commercial banking sector and for Pekao S.A. Bank. Figure 3 shows
remarkable efficiency of the bank over the period 2001-2012 (first semester). In addition, it should be emphasized that the presented period was not easy for all banks. Additionally, during this period a globally unique process of dividing the BPH bank into several tiers and acquiring some of them was performed by Pekao S.A. Bank.

Figure 3 also shows that the distance between Pekao SA and the whole banking sector is decreasing. This may reflect the fact that over the past few years, more and more commercial banks have implemented advanced tools enabling banks to modernize their management processes. Some of them are implementing the MBO system. E.g. Raiffeisen Bank Poland did it in early 2009. On the other hand, it may indicate that the pace of improvement of processes and associated development in the central MIS at Pekao S.A. has weakened in comparison to the changes in the sector as a whole. However, it should be noted that the gap is still large.

Figure 3. Selected Efficiency Ratio for Pekao Bank and the commercial banking sector in Poland (C/I costs/income ratio, ROA - return on assets, ROE - return on equity). Source: own case study based on data from the Polish Financial Supervision Authority and the financial statements of Pekao Bank
REFERENCES


