Efficiency Model of Information Systems as an Implementation of Key Performance Indicators

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Summary

Automated performance management process is an issue of any company. As a whole means employees and departments explain the long form of key performance indicators of the company. KPI based management information system increase performance structure. At present, the urgent task is to improve and expansion of mathematical security structures due to the use of modern information technology. This will improve the efficiency and enhance the distribution of the functionality expand. For modern enterprise management - process complexity, an important constraint of calibration solutions need been taken, based on a very short time, a large number of financial analysis and other information.

Key words:
Information Systems Management, System performance, Key performance Indicators, Data warehouse, Information Systems Integration

1. Introduction

One of the modern tools for effective management is considered the automated performance management system, its affiliates and employees, with respect to the company strategy tools purposes for a specific period. The task of automation systems design is a class complicated by the fact that they must be integrate with a large number of systems that take advantage of the company, to create and test the effectiveness of the visual display of information, for decision-making at all hierarchical levels of the company [4].

The article deals with the development of information systems (IS), which allows anyone to solve complex problems in the effective control of business [2,3]. At the heart of the control system, efficiency is a formal methodology evaluating the performance of each staff member and divisions of a company, as well as the company as a whole. As an advocate estimates misleading business process (BP) performed with staff members and departments, called key performance indicators (KPI) [9,13].

2. Theoretical Consideration

Therefore, KPI benchmark objectively understands BP statistical measure for determining the efficiency of the process. In general, each KPI is different from the probability of formal requirements that are listed below [1]

• Objectivity or calculation the total formulation;
• Simplicity of calculation;
• Rules and frequency measurement;
• Planning the feasibility of the KPI value that employees or goals should achieve performance version of the company;
• Focus on the target group

In addition to the formal requirements for ops quality time, KPI also exist and quantitative governmental requirements for them. Thus, for each level of the new administration, we evaluate the effectiveness of the operation with the help means of key performance indicators, the following recommendations [1,2,7] provides:

• No more than 10 indicators for the company as a whole;
• 5-7 indicators for each of its divisions;
• 3 to 5 for each employee.

Such a small number of indicators identified by the fact that each branch level management indicators should be fully understood by the staff and heads of departments, their method of calculation should be transparent, and most importantly [4], the value of all KPIs should be easy to follow. To balance a system set, indicators should also considered as a rule, stating that the system must be presented as a process, as well as design parameters. Process indicators may differ their actual values at anytime, while the design actual value is derived from more closed reporting period (stage) project [5,14]. For the KPI development of reliably assess efficiency of operations, parts of companies or employees will take into consideration not only formal quality and quantity demands to know them, but also it should be as an understood subject area. Mandatory project prior development and implementation of KPI, is a complete description of BP [8,10]. Performance Management business is implemented on each reporting period ,while

at the end of each implemented period is to improve the system performance ,including changing the target values of KPI [12]. Scheme of BP Performance Management is shown on Fig. 1. This complex designed is to address the following issues:

• focus the efforts of all employees and priority areas allocated to the formation of strategically goals of the company ;

• Creation of a common information space of operations for staff and managers ;

• The implementation of the comrade projection and operational monitoring of the actual financing and implementation real training to produce business of government;

• Lead to the final grade of earned purposes at all levels of the company.

2.1. Information block diagram

Synthetic variant groups of decision-making approaches in information technology that are determining a selected group of methods in the basic building blocks following the next [9,15]:

- How to develop decision-making group selection unit;
- Process -based group entity;
- Template- based structure for determination the method-based solutions;
- Hierarchy Process cohort analysis;
- Generating requirements unit for the new method of decision making group;
- Generating unit for reporting the results of identifying incompatibility of the new method, and suggestions to address identified incompatibilities;
- Method of development adaptation block (allows volume unities methods with different functional impact)

2.2. Structure of IS

In fact, for a comprehensive and in a timely response, all tasks of business performance management IS was created. Its generalized structure is shown on Figure 2. Marrow IS data warehouse created a database management system, thrilled (DBMS) Microsoft SQL Server. The structure designed especially to store large volume of planned and actual values of KPI, and the hierarchical structure of the strategic company's goals [14].

Develop all the necessary information system outside the company KPI, calculations and using automatic integration based on other series of modules, including subsystem data collection collects and provides manual entry for non - automated part to obtain a metric workstation. Visual information representations of the dashboards implementation and reports are using the MS Share Point SQL Server Reporting Services [3]. From the user point of view the IS represented a set of workstations

of four types, each of which will allow carrying out part of the BP Performance Management shown on Figure1.
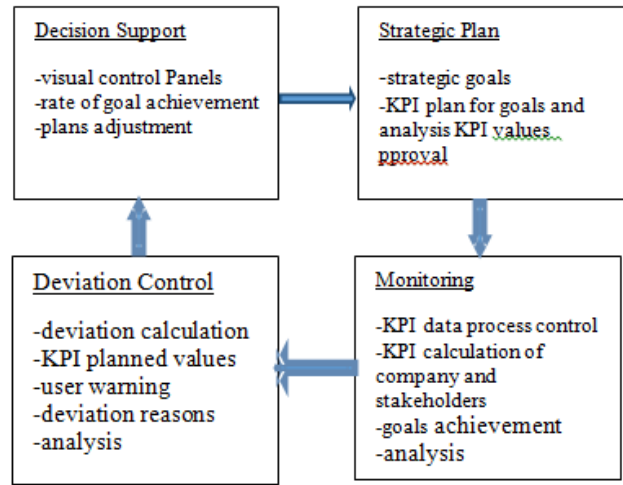

Fig. 1 Scheme of the BP Performance Management.

2.3. Automation Strategic Planning

In the first step of the complex BP Management efficiency is considered necessary, the strategic objectives, their distribution and a reduced level of the partitions. To achieve all identified purposes described for each employee, a number of indicators that a manager has an opportunity to evaluate for achieving the effectiveness. The type of functional components in the result set is collected by the Key Performance Indicators (KPI), [4].
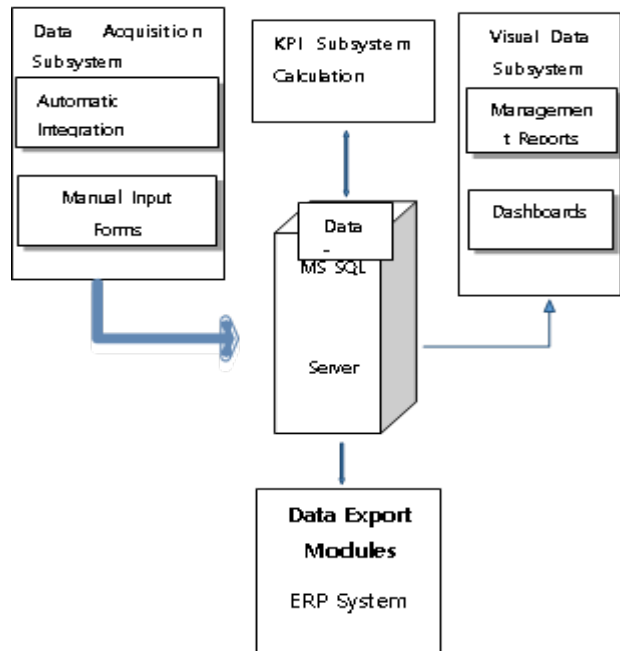

Fig. 2 Scheme of a generalized IS framework

In the second step, make rules or developing algorithms, for settlement indicators indicating the minimum and maximum of possible values of KPI. Calculation rules should be simple enough for employees to measure values by these indicators, as well as their directly managed opportunity to understand the assess principles and monitor their activities for the present value of an indicator, in the results, compiled matrix of KPI for each conics [7]. This document includes a list of KPI division parameters, to measure the performance of activities from staff member, and the weight of all the exponents defining the significance of each of them. Analogous matrix compiled for each KPI division and the company as a whole.

KPI IS- set of key indicators for each KPI's are made according to the matrix obtained from the responsible data of employees. After all the guide details of the plan value, can be notified the system manager and the staff to start a KPI monitoring company [5]. The result of the first BP is shown on Figure1. It is a fully configured mated control system efficiency of business, ready to work on a given planning period.

2.4. Automation monitoring KPI

Gathering information about the actual KPI values is one of the main components of the sub- display. Two versions of the information layers implemented: automatic import to external sources, and manual input data. Developing IS implementation is shown on Fig. 3, an automatic import data on the actual value or results of data operations to calculate. The most convenient import analysis of course, is a web service. In this case, the index should be set only the address of the web service and the polling frequency. We considered as the most preferred embodiment when importing data from external systems. In the absence of inadequacy, Web service function of an external sourceused to direct IS data, reliquary database system (DB).
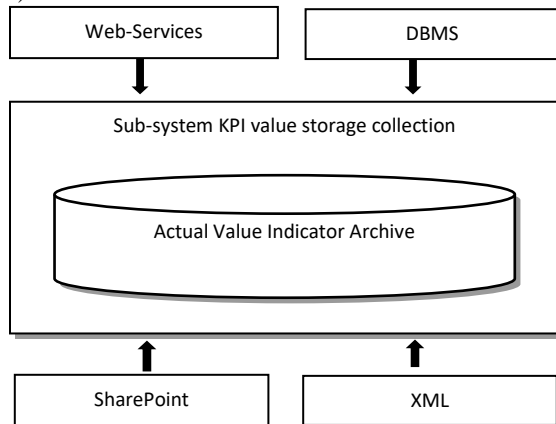

Fig. 3 The scheme of automatic data collection

Microsoft SQL Server, MySQL, Oracle in this case used for the index set type and name of the database server, the script text is for the desired value and the period of the survey. Access databases are through the library of the .NET framework.

The most common implemented method obtain the actual indicator value is to use the format specified in the XML file display [5]. In this case, the KPI store the file name of the lock and determine the frequency. The format of this file:

```
<KPI>
<Value></ Value>
<Date></ Date>
</ KPI>
```

User access to the data collected in this special version of the Microsoft SharePoint, portal KPI list is designed to determine the actual value; useful to evaluate the implementation of automated co- plugging BP means a unit of an enterprise portal. They agreed to the IS during the reporting period, but when the KPI true value is calculated at Keystone, it is real data raw. In the first step, calculate the value of a KPI based on the actual value of the first data. The second step is the calculation of new value of the KPI, which fall the actual indicator value, and linear law is needed to account for this period. KPI approved a separate module priority; sub- tracking module of the actual value. This module applied for each KPI to the assistant routine of actual value adoption process circuit. At the end of the reporting period, the signal module needs to construct the missing factorial data and approve the KPI values appropriate for managerial level.

2.5. Automation control deviations

Based on this calculation, the actual values are reported to the owner of KPI departure. Discern that this mechanism is divided into two parts: in the period, to receive adequate notice of prevention for managers and problem solving, and notification in fact. Control subsystem also contains deviations analysis module causes deviation. The purpose of this module is to find in the archive actual KPI values of those periods KPI to time, in which the mass change values KPI. The implementation of the algorithm based on the mechanism of business intelligence SQL Server database.

2.6. Automation Decision Support

Dashboards of indicators, allow visually put large amounts of information. Details, selected by the display of all KPI levels values accompanied by color indication. Overall, system performance evaluation indicators seem as mixed - with color, display shows the current success level of a private management official company. Further, it is possible that a prepaid rate of decomposition levels of staff is conspecific. With this tool, each employee, coming

on a corporate portal and passing authorization can get to see the IS and their KPI, planned the actual values on Table 1.

The results of the IS in the following period, the achievement of objective assessment of the goals that has benefits to entire company and its businesses, employees and the contribution of each employee and divisions of the company shown on Table 1. Therefore, results of the KPI calculation are transferred to the Enterprise Resource Planning (ERP) system, which uses to calculate the size of premiums employees.

Table 1: Example dashboards employee

KPI	Weight	Calc. unit	Planned	Actual	Coefficient Performance
IS maintainable available time	0.25	%	99.7	99.4	1.00
Number of successfully completed projects	0.25	Pcs.	5	5	1.45
Standard violated applications percentage	0.30	%	0.52	0.83	1.20
Clients satisfaction degree	0.20	Point	0.91	0.94	1.40

3. Experimental Consideration

Today, corporate managers see the company as an essential tool of strategic and operational management. Each employee of the company appeared the ability to monitor in real time is more effective than formal display manufacturers, after all known measured and presented forms of a simple and objective evaluation of digital color indicators. On the list of KPI and their staff coefficients, weighting factor has the ability to separate period-defined priorities. It also has the ability to understand what to do to maximize the value of a KPI.

In the system environment division, leaders monitor the effectiveness of each employee. Divisions led to the article to assess the level of impact, and appeared to be possible to identify the priority turn of actively efficiency detection of employees and managers in these areas.

Company level helped monitor the implementation of the strategic objectives and assessing the effectiveness of all its divisions and employees, based on embedded enterprise KPI. For example, the influence of KPI systems and embedded IS activities divisions, consider the

evaluation activities results of the information access as reporting periods of KPI operation system and IS development.

Integral parts of the control system efficiency and activities serving on sub divisions considered the agreement on the level of servicing (Service Level Agreement), which governs the relationship between the supplier and consumers of services. It contains a description of the mustache area, the rights and obligations of the parties and specified service quality.

Table 2: KPI Value Changes, relative to the first reporting period

Index/quarter	II qr 2015	III qr 2015	IV qr 2015	I qr 2016
Clients satisfaction growth, based on services	103.20	103.40	103.55	103.71
User requests percentage increase, executed under the standards	119.80	119.92	123.90	124.10

Developed IS enables a comprehensive auto disaggregated as all BP performance management. It can quickly target hierarchical strata company's goals and define a set of KPI, describing the pursuit each of them. For a given reporting period, IS automatically collects evidence from external systems that make it possible to carry out a manual entry number of initial data calculated on the collected KPI data values.

4. Conclusion

The automation problem of the industrial processes for company performance management method is described with preparation of important indicators of staff efficiency and the company as a whole. The company information structure, elaborates system performance management, based on indicators effectiveness efficiency and a detailed description of the subsystems. The results of the typical information system are implemented for many companies in information technology.

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