

Evaluating a power grid company's employees' effectiveness

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Abstract

Development and automation of key performance indicators system to measure and assess efficiency of work of employees on a regular basis is an urgent task for any enterprise. As a rule, a KPI (key performance indicators) system may be successfully implemented in the company for the management of top and middle levels. The issue of measuring the efficiency of work of every employee of the enterprise on the basis of his or her job duties and respective business processes still remains in abeyance.

This paper includes the algorithm for the compilation of efficiency of work indicators (EWI) for the employees of a power grid company, inter alia – working out divisional functional matrixes, highlighting business processes on the top level, including them to KPI, simulating business processes, synchronizing matrixes and processes, specifying EWI for every function of division, calculation formulas and data sources.

It is shown in the example of several functional areas how the automation of business processes of a power grid enterprise, as well as collection of data and calculation of EWI helps to control performance of employees, analyze their workload, quality of work on a regular basis and set standards.

Using this approach we will have a system for the evaluation of efficiency of business processes, to identify and assess their advantages and disadvantages, achieve maximum performance of each and every employee due to identification and development of his or her unique and specific skills.

Keywords: key performance indicators, efficiency of work indicators, business processes, functional matrixes.



1 Introduction

Currently, a lot of various methods may be used to assess efficiency of companies and each specific employee. These include for example – balanced score card (BSC), Management by Objectives (MBO), business performance management (BPM), management on basis of key performance indicators (KPI). By using these methods companies generally succeed in development of a KPIs system for top and middle management [1]. However, one question is still open – assessment of performance of each specific employee of the enterprise based on his or her job duties and business processes such employee is involved in. When the company has over 6,000 employees there may be some difficulties not only with development of KPIs for each employee, but also with regular monitoring of their performance.

This paper includes the algorithm for compilation of efficiency of work indicators (EWI) for the employees of a big power grid company.

2 Phase 1: development of business processes model

The first step was to develop a model of business processes of the top level (fig. 1).

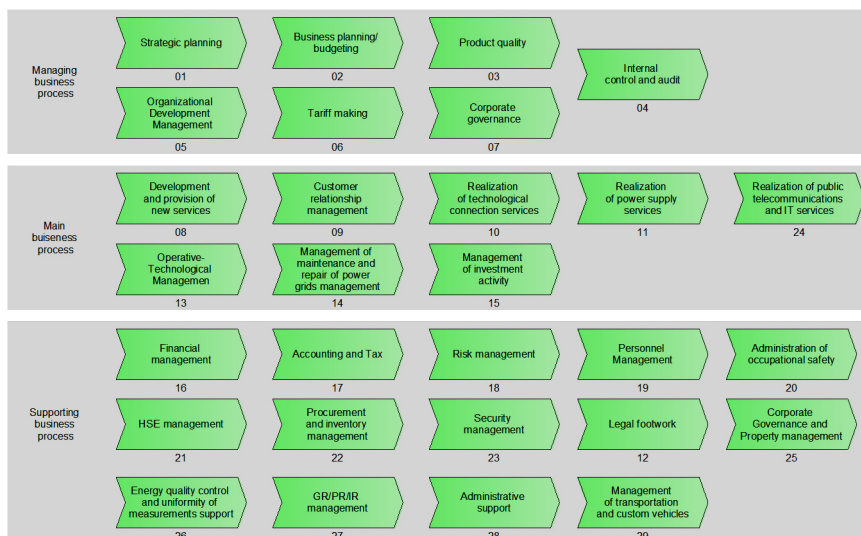


Figure 1: Business processes of the top level.

As we can see from the model, only less than 35% of processes are of specific kind referring to the activities of a power grid enterprise. The balancing 65% are typical for the companies of other sectors. Subsequently, the algorithm described herein may apply not to power grid enterprises, but also to any other companies.

After a model for each process the key indicators were defined and approved by top managers – process objective, KPIs, sub-processes, risks, owners, basic inputs and outputs. The deputy directors general were defined as process owners.

Subsequently, KPIs of top managers and KPIs of middle management were selected from the KPIs of business processes.

3 Phase 2: development of functional matrixes of structural divisions

In the second phase two tasks were performed at the same time – detailed business processes modeling up to functions to be performed by the employees of the divisions and compiling functional matrixes of divisions with the description of functions of the employee.

Business processes modeling was carried out with the use of ARIS software with the use of EPC notation (Event-Driven Process Chain). In the course of modeling As-Is processes were optimized to build To-Be models.

- Works on compilation of functional matrixes were performed in several steps:
- Step 1. Decomposition of activities of structural divisions. First 2-5 main tasks of the divisions are defined, which show the principal areas of its activity. Then each S is decomposed into functions of the division with further decomposition into functions of its employees. At this step the mandatory verification and harmonization of the list of employees’ functions were made from the matrix with functions as specified for models of business processes.
- Step 2. Definition of the composition of typical positions of the structural division and their responsibility areas in its activities. The typical position may include one or several positions with one name if the respective employees were responsible for the same set of functions. Alternatively, even though two employees perform different functions, they may be defined within one typical position. After definition of typical positions of the division a person in charge (pic) and a controller (c) of the division’s staff were assigned to each function [2].

Functional matrix			P1	P2	P3	P4
Task of SD 1.	Function of SD 1.1	Function 1.1.1	c	pic		
		Function 1.1.2	c	pic		
	Function of SD 1.2	Function 1.2.1		c	pic	
		Function 1.2.2	c			pic
	Function of SD 1.3	Function 1.3.1	c	pic		
		Function 1.3.2	c	pic		
		Function 1.3.3	c		pic	
Task of SD 2.	Function of SD 2.1	Function 2.1.1	c	pic		pic
		Function 2.1.2	c	pic		
	Function of SD 2.2	Function 2.2.1		c	pic	
		Function 2.2.2	c	pic		



4 Phase 3: development of EWI for the employees of structural divisions

On the basis of functional matrixes the EWIs for each typical activity were compiled in accordance with the functions of structural division. General rules for development of EWIs were as follows:

- The indicators shall support the EWIs of the process where the respective function of the structural division is used.
- The relevant data shall be collected and processed in regular periods of time.
- Labor costs for collection and processing of data shall not exceed the value of such data.
- The indicators shall assess the qualitative and quantitative features of the function of structural division.

Responsibility sharing matrix of compliance with EWI:

Functional matrixe of SD				EWI		Calculating formula,				PIC of reporting data			PIC of EWI		
	Task name		Function name		Indic. name					SD	position		position	position	position
													Name	Name	Name
1	Task of SD №1	1.1	Function 1.1	1	Indicator to function of SD № 1.1										
		1.2	Function 1.2	2	Indicator to function of SD № 1.2										
				3	Indicator to function of SD № 1.3										
2	Task of SD №2	2.1	Function 2.1	4	Indicator to function of SD № 2.1										
				5	Indicator to function of SD № 2.1										
		2.2	Function 2.2	6	Indicator to function of SD № 2.2										



As mentioned above, KPIs of top managers and heads of structural divisions are generally selected from KPIs of business processes of the top level and strategic objectives of the company as well. The requirements to frontline employees are more straightforward – he or she has to perform his or her functions or do the job of good quality in a timely manner and in accordance with the prescribed volumes (i.e. handle the workload). Most EWIs were designed to monitor compliance with these three requirements.

Just-in-Time: the employee being involved in the process carries out similar operations, i.e. handling consumers' applications for technological connection or drawing up terms of reference for procurement of materials or works, issuing waybills for motor vehicles etc. Performance of one operation shall take a certain amount of time in accordance with the process (hour, day, week, and month) or a deadline shall be set for performance of such task.

The first EWI is the “just-in-time” performance of the function which shall be as follows:

$$C_j = \frac{Q_\Phi - Q_{np}}{Q_\Phi} * 100\% - \text{rate of timely performed operations};$$

where: Q_a – quantity of actually performed operations;

Q_o – quantity of actually performed overstaying operations;

$C_j=100\%$ means that all tasks were performed “Just-in-Time”;

The second EWI is the “just-in-time” allows to reflect the characteristic deviations from the date:

$$C_d = \frac{\sum_{i=1}^{Q_a} (\text{actual date} - \text{planned date})}{Q_a} - \text{mean deviation between the actual date to the planned date for the period};$$

High rate of timely performed operations and high mean deviation means that the employee failed to perform one or two operations in due time, these might be complex issues etc.

Low rate of timely performed operations and low mean deviation means that the employee needs a bit more time for performance of the operations. In such case it is necessary either to give some extra time or train and improve the employee's skills.

The quality of the employee' work is in the most cases assessed by the number of the justified reprimands by the controller monitoring the quality or accepting results of works or the number of corrections which the employee has to make due to the reprimands.

The quality may be also assessed by the achievement of the set objective, i.e. the EWI assessing the quality of performance of the function “Distribution and sharing of non-demanded inventories between production divisions” will be as follows:

$C_{dis.non.} = \frac{Q_{dis.inv.}}{Q_{total.non.inv.}} \times 100\%$ – efficiency coefficient of distribution and sharing of non-demanded inventories,

where $Q_{dis.inv.}$ – quantity of distribution of inventories, pcs.

$Q_{total.non.inv.}$ – total quantity of distribution and sharing of non-demanded inventories, pcs.

Execution of norm/plan is measured by the following EWI:

$$Q_{ep} = \frac{Q_a}{Q_p} \times 100\% \text{ – percent of execution of the plan for the period;}$$

where Q_a – actual quantity of executed operations for the period;

Q_p – normative/planned quantity of executed operations for the period;

First, the statistics data are collected to work out norms (for monthly indicators in the course of a year), the volumes of work are compared which were accomplished by different employees, the reasons of differences are analyzed.

Let's have a look at the compilation of EWI in terms of process of transportation management for the inherent not only power grid enterprise by using the above mentioned rules.

But first, we will give some short information of the management structure of the power grid enterprise.

The power grid enterprise has 3 levels of management – executive office, production divisions (PD), distribution zones (DZ). Each management level is split into functional units – technical unit, unit for realization of electric supply services, finance and economic unit, HR unit etc. The divisions within of the functional unit are functionally subordinated to each other on different management levels. In particular, the department of equipment and transportation management is subordinated to the transportation management department (TMD) in the executive office though administratively this department is subordinated to the director of production division. The equipment and transportation management group in distribution zones is functionally subordinated to the equipment and transportation management department of production division, but administratively – to the head of distribution zones. The objective of process for transportation management is to timely ensure satisfaction of the demand of the Company and subsidiaries on transportation services and custom vehicles with the minimal costs for this type of services. One of the KPIs for this process is the ratio between the number of the timely processed and accomplished transportation and custom vehicle orders of the power grid company and the number of the orders within the reporting period representing the first part of the objective. This indicator may be selected as EWI of head of the department.

EWIs for employees of management department for equipment and transportation of the production division may be as follows:

For the head of the management department for equipment and transportation – timely performance of orders for transportation from the production division, vehicle availability rate.

For traffic controller – quality of registration of vehicle orders processed just in time, just-in-time issuance of waybills.

For foreman and equipment operator – high-quality maintenance and routine repair performed in a timely manner, i.e. if the vehicles are not in good repair, the order will not be accomplished.

For drivers: just-in-time delivery of the filled in and signed waybills to the traffic controller of the management department for equipment and transpiration upon completion of works.

EWIs for employees of the group for equipment and transportation: For foreman: quality of inspection of technical conditions of the vehicles, just-in-time placement of orders for the repair.

This paper describes an example pertaining to only one aspect of the transportation management process. The comprehensive approach is much broader which also includes all traffic accidents and relevant costs, efficiency coefficient for vehicles and interaction with supervisory authorities.

5 Phase 4: automation of business processes

The fourth phase may be carried out parallel to the third phase. It is important that the source data for calculation of EWIs are to be considered in the terms of reference for automation of business process.

After automation of the business process the terms of reference for collection of data and calculation of EWIs is compiled, this includes the references to data sources and easy-to-use forms for review and analysis.

For instance, after implementation of 1S: Enterprise software for automation of business process, 1S became the source of data for calculation of most transportation EWIs, i.e. such EWI of traffic controller as “just-in-time issuance of waybills”:

EWI		unit of measurement	Calculating formula, criteria	variable	Base of information	PIC of reporting data		Frequency
EWI №	Indic. name					production divisions	positions	
1	Just-in-time issuance of waybills	%	$Q_{jin. i. w} = \frac{Q_{a. i. w.} - Q_{o. i. w.}}{Q_{a. i. w.}} \times 100\%$	Q _{jin. i. w.} – quantity of the issued Just-in-time-waybills, %	calculating	-	-	Every month
				Q _{a. i. w.} – quantity of actually issued waybills, pcs.	1S	-	-	
				Q _{o. i. w.} – quantity of the overstaying issued waybills, pcs.	1S	-	-	

In accordance with the established rules the traffic controller shall issue a waybill within X hours after placement of the order. The software program fixes the time of placement of the order and the time of issuance of a waybill. If the time differs from the prescribed term, the waybill will be referred to as a delayed one.

In each division of the power grid enterprise there is a traffic controller in charge for handling the orders referring to his or her production department. On basis of the monthly information about the delays and the quantity of the issued waybills for the period in question it is possible to compare the workload of the traffic controllers as for this type of work, their efficiency to take the relevant managerial decision.

As a result of successful implementation of all the above phases the company's management will have a system for assessment and regular monitoring of the personnel available which will enable to identify and assess their advantages and disadvantages, achieve the maximum performance of each and every employee due to the identification and development of his or her unique or specific skills.

6 Conclusion

Algorithm for development of EWIs of the company's employees as shown in this work was developed in the course of implementation of projects "Standardization of the activities of structural divisions of "Bashkirian distribution networks" LLC and "Implementation of the data system on basis of 1S 8.2 products for automation of business processes of "Bashkirian Power Grid Company"" JSC and "Bashkirian distribution networks" LLC in the following business processes – technological connection of consumers, management of transportation and custom vehicles, procurement and inventory management, treasury issues and doc-flow management.

The main objective – to objectively and regularly assess the performance of company's employees due to development and automation of EWIs collection and calculation processes – has been successfully achieved. With consideration of the fact that over 65% of business processes are not specific for the activities of a power grid enterprise, the companies of other sectors may also freely apply this algorithm with the relevant EWIs.

References

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