

# TECHNOLOGIES AND METHODS OF BUSINESS PROCESSES ANALYSIS AND OPTIMIZATION

## TECNOLOGÍAS Y MÉTODOS DE ANÁLISIS Y OPTIMIZACIÓN DE PROCESOS DE NEGOCIO

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### ABSTRACT

The process approach to management is based on the automation of various aspects of the company's activities. The formation, optimization, restructuring and improvement of business processes are occurring with the applied systems' introduction. Nevertheless, business analysts play a key role in optimizing a company's business processes. The study intends to scrutinize the technologies and methods of business processes analysis and optimization. To that end, monographic, economic-statistical, and abstract-logical methods are employed. Based on the results, in the context of the optimization methodology, optimization can be regarded in the frame of business processes' reengineering. The study of the optimization methodology for business processes revealed several elements of this process, including the choice of methods of analysis and optimization of business processes, ranking of business processes by their importance to show priority processes to start optimization with, and finally, development of a system of key performance indicators to link the personnel motivation system with the achievement of tactical and strategic goals of the company.

**Keywords:** Business Processes; Key Performance Indicators; Ranking Of Business Processes; Depreciation.

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## RESUMEN

El enfoque de proceso de la gestión se basa en la automatización de varios aspectos de las actividades de la empresa. La formación, optimización, reestructuración y mejora de los procesos de negocio ocurren con la introducción de los sistemas aplicados. Sin embargo, los analistas de negocio juegan un papel clave en la optimización de los procesos de negocio de una empresa. El estudio tiene la intención de examinar las tecnologías y métodos de análisis y optimización de procesos de negocio. Para ello se emplean métodos monográficos, económico-estadísticos y lógico-abstractos. Con base en los resultados, en el contexto de la metodología de optimización, la optimización puede considerarse en el marco de la reingeniería de procesos de negocios. El estudio de la metodología de optimización de procesos comerciales reveló varios elementos de este proceso, incluida la elección de métodos de análisis y optimización de procesos comerciales, la clasificación de procesos comerciales por su importancia para mostrar los procesos prioritarios para iniciar la optimización y, finalmente, el desarrollo de un sistema de indicadores clave de desempeño para vincular el sistema de motivación del personal con el logro de las metas tácticas y estratégicas de la empresa.

**Palabras clave:** Procesos comerciales; indicadores clave de rendimiento; clasificación de procesos comerciales; depreciación.

## INTRODUCTION

The optimization of business process is regarded as a multidimensional procedure including different analysis approaches regarding various aspects of the evaluation (see Table 1):

- Sales and marketing;
- Business and corporate strategy;
- Finance and organization management;
- Supply;
- Technology and innovation management;
- Workers.

**Table 1.** Approaches of business processes optimization and analysis

ASSESSMENT ASPECTS	ANALYSIS METHODS
<b>BUSINESS AND ORGANIZATION STRATEGY (EGOROVA, 2019)</b>	Abel matrix, Ansoff matrix, BCG matrix
	Competitive analysis
	SWOT analysis
	Roadmap
	Strategic maps
	Scenario plan

ASSESSMENT ASPECTS	ANALYSIS METHODS
ORGANIZATION AND ITS MANAGEMENT (EGOROVA, 2021)	Model 7 S
	Risk management
	Balanced scorecard
	Value chain
	Benchmarking
	Greiner's growth model
FINANCING (TKACHENKO ET AL., 2019)	Risk management
	Cost and Functional analysis
	Economic value added and weighted mean expense of capital
	Financial ratio analysis
SALES AND MARKETING (EGOROVA, 2021)	Branding pentagram
	Karri consumer pyramid
	Crowdsourcing
	Social network analysis
SUPPLIES (OSADCHY AND AKHMETSHIN, 2015).	Reengineering of business process
	Six Sigma
	Kaizen / genba
	Just-in-time
TECHNOLOGY AND INNOVATION MANAGEMENT (GILGOMEZ ET AL., 2020)	Bass diffuse model
	Innovation cycle
	Information technology strategic compliance model
WORKERS (FEDOTOVA ET AL., 2018)	Change Quadrants
	Deming cycles
	Kotter's 8-Step Change pattern

The table demonstrates merely a few fundamental management patterns utilized in the business processes optimization.

Let's take into consideration methods to the processes of ranking business on the basis of the Pareto principle.

## METHODOLOGY

The methodological and theoretical base of this current survey is the foreign and domestic scientific articles and sources regarding management accounting, controlling, and management. While shaping the KPI, the business procedures of Artisan LLC, a huge producers of non-alcoholic and low-alcohol products in the south of the Russian federation, are taken into account. In order to obtain the aim of the study and resolve the issue raised in the procedure of completing this study, the next approaches are utilized: abstract-logical, monographic, as well as economic-statistical.

The option of business procedures for the aim of optimization necessitates informed guidance by the Pareto principle: select twenty percent of the highest priority procedures of all of the top-level business procedures.

## RESULTS

In actuality, the next standards are utilized to select priority business procedures (Page et al., 2021; Levchenko, 2018):

1) The significance of the business procedure is defined by the level of its impact on the attainment of the organizations' strategic purposes;

As a result, business procedures are ranked by significance and value based on a scale from one to the number reflecting the processes' number. Regarding that, one is the least significant procedure.

2) The troublesome essence of the business procedure implies the variation among the needed and available key indicators of the business procedure. maintaining the benefit in key performance indicators by five to twenty percent for so long permits the organization to outdistance competitors; may be inferred as the distinction among the factual and the competitors indicators (see Table 2);

**Table 2.** Criteria and scale for evaluating business procedures and their problem's degree

PROCESS EVALUATION	EVALUATION CRITERIA	VALUES
GREAT	The procedure outcome is nearly devoid of drawbacks. A huge enhancement is obtained in the process of business. Favorable alterations are designed for the future	1
GOOD	Good enough enhancement in process performance in comparison to plan. Desirable alterations anticipated and predicted for the future	2
SATISFYING	The processes being utilized in the process of business are efficient, there exist no considerable issues. Process management actions are being performed. Key process indicators are developed	3
NOT GOOD ENOUGH	There are drawbacks, which, nonetheless, can be modified. Process management actions are performed	4
BAD	The procedure is utterly or nearly inefficient. There stand severe disadvantages that need correction. The major actions to curb the procedure aren't conducted	5

Consequently, business procedures are ranked by their problem's degree on a scale from one to five: one- the smallest, and five - the greatest.

3) The likelihood and expense of making alterations to the process of business.

The primary probable barriers over the course of making alterations are demonstrated in Table 3.

**Table 3.** The primary likely barriers in the course of making alterations

<b>GROUP OF BARRIERS</b>	<b>DESCRIPTIONS</b>	<b>BARRIERS DEGREE</b>
<b>FINANCE</b>	Financial expenses of making alterations to processes of business, expenses of now and future periods	one – the lowest five – the highest
<b>WORKERS</b>	Resistance to alterations by staff in business procedures. A hasty battle against them may result in the employees' outflow and the shortage of qualified experts	One to five
<b>LEGISLATIONS</b>	Elements associated with legislations that are related in the course of a responsibility redistribution between positions and departments	One to five
<b>OTHERS</b>	Other influential elements impeding the optimization or increase the implementation cost	One to five
<b>PROBABLE EXTENT OF ALTERATION</b>		One to five

As a result, the processes of business are ranked by their the possibility degree and expenses of making alterations on a scale of one to five.

Let's consider the below business procedures of a random trading organization:

- Sales;
- Procurements;
- Investment;
- Warehousing and inventory management;
- Management of assets;
- Workers;
- Budgeting and business planning (Roussy and Perron, 2018).

The priority degree is defined by adding the points marked by 3 features (see Table 4). regarding seven business procedures, the highest and lowest priority indicators are 17 and 3, in turn.

**Table 4.** Business processes' ranking

<b>PROCESS OF BUSINESS</b>	<b>IMPORTANCE DEGREE</b>	<b>PROBLEM DEGREE</b>	<b>PROBABLE EXTENT OF ALTERATION</b>	<b>PRIORITY DEGREE</b>
<b>SALES</b>	6	2	2	10
<b>PROCUREMENTS</b>	5	1	2	8
<b>INVESTMENT</b>	1	2	1	4
<b>WAREHOUSING AND INVENTORY MANAGEMENT</b>	2	4	3	9
<b>MANAGEMENT OF ASSETS</b>	4	5	4	13

<b>WORKERS</b>	3	3	5	11
<b>BUDGETING AND BUSINESS PLANNING</b>	7	1	4	12

Hence, it seems crucial to pay close attention to that kind of business procedures as business planning, management of assets and also budgeting. The business processes of manufacturer organization are ranked in an alike manner. While boosting business procedures, it appears recommendable to begin with the approach of five inquires (Table 5) (Andaloussi et al., 2020).

**Table 5.** 5 groups of questions regarding the process

<b>GROUP</b>	<b>KEY QUESTION</b>	<b>INQUIRIES</b>
<b>GOALS</b>	What is the task?	Why the process is done?
		is conducted to obtain?
		What are the plans and operational aims that process
<b>INDIVIDUALS</b>	Who will do it?	Who could this process have performed more desirable?
		Why does he perform it?
		Who will do that process?
		Who else can do the process?
<b>PLACES</b>	Where is it competed?	Where does the process occur?
		Where can the process be performed mode desirable?
		Why is this performed here?
		Where else can the process be conducted?
<b>TIME</b>	When is it performed?	When is that process performed?
		Which substitution is mode favorable?
		What are the substitutions?
<b>TECHNOLOGIES</b>	How is it conducted?	Why is the process performed at the specific time?
		How else can the process be performed?
		Which is the more desirable manner to perform the process?
		How is the process performed?
		Why is the process performed that way?

Following the development of data regarding processes of business, in the subsequent step of optimization, the developed KPIs are evaluated (Al Dakheel et al., 2020; Lestari et al., 2020).

Let us examine the key performance indicators of the Technology and Quality Department developed for Artisan LLC, a huge manufacturers of non-alcoholic and low-alcohol goods in the southern Russia. For instance, the next major indicators may be detected for the quality and technology managers:

- The completed product sanitation and quality (blended syrup, BRIX, in line with technological regimes);
- No shortage of drinks over the course of blending, no technological process violation and comment on certifications;
- Succeeded implementation of the individual aims established by the directors.

KPIs generated for the Quality and Technology Department of Artisan LLC are demonstrated in Table 6.

**Table 6.** KPIs for the Quality and Technology Department of Artisan LLC

<b>SERVICES AND POSITIONS</b>	<b>KEY INDICATORS FOR BONUS</b>	<b>EVALUATORS</b>	
<b>CERTIFICATION DEPARTMENTS</b>			
<b>DEPARTMENT'S HEAD</b>	Not any comments on product certifications	Technology and quality directors	
	Favorable execution of the individual aims established by managers		
<b>CREATIVE PROJECT SPECIALISTS</b>	Desirable execution of the individual aim established by managers		
	Agreement with the preparation terms and affirmation of files		
<b>CERTIFICATION SPECIALISTS</b>	Timely examination of legal frameworks		
	Desirable execution of the individual aim established by managers		
<b>DEPARTMENT OF PROCESS</b>			
<b>DEPARTMENT'S HEAD</b>	Completed product quality , mistakes absence		Technologies and quality director
<b>DEPARTMENT'S DEPUTY HEAD</b>	Appropriate logging and reporting of process		
	Desirable execution of the individual aim established by managers		
<b>PROCESS ENGINEERS</b>	Completed product quality and sanitation, mistakes absence	Technologies and quality director	
	period of unplanned downtime because of production disruptions		
	Desirable execution of the individual aim established by managers		
<b>BLENDING SHOPS</b>			
<b>BLENDING SHOP LOADERS</b>	Agreement with technological procedures, states defined in blend cards	Technologies and quality director	
	Appropriate and secure equipment operation, inventory safety		
<b>BLENDER BLENDER'S ASSISTANTS</b>	Completed product quality and sanitation, mistakes absence		
	Agreement with technological procedures, states defined in blend cards		
	Appropriate and secure equipment operation, inventory safety		

**DEPARTMENT OF QUALITY CONTROL**

		On-time execution of the program of production control for created goods	
<b>DEPARTMENT'S HEAD</b>		Timely execution of documents and reports	Technologies and quality director
<b>DEPARTMENT'S DEPUTY HEAD</b>		Completeness and timeliness of metrological tasks in all of the departments	
		Desirable execution of the individual aim established by managers	
<b>QUALITY CONTROL ENGINEER</b>		Execution of the technical-chemical control plan On-time recognition and record of inconsistencies in the chemical and physical parameters of the drinks with the recipe and the needs of GOST and TU	Technologies and quality director
<b>ANALYTICAL CHEMIST</b>		Desirable execution of the individual aim established by managers	
		High-quality and timely preparation of media, reagents	
<b>MICROBIOLOGY ENGINEER</b>		Proper detection of inconsistencies in segments	Technologies and quality director
		Execution of the programs of microbiological control	
		Analysis results' registration	
<b>ACCEPTANCE CONTROL LABORATORY ASSISTANT</b>		proper execution of incoming control of auxiliary and basic material	Technologies and quality director
		Agreement with methods and rules of analysis and sampling	
		Analysis results' registration, documentation and logging	

The key performance indicators' development is utilized in forming the workers' bonuses system (Eliferov, 2021).

**CONCLUSION**

The business processes optimization should deem the next common reasons for the discrepancy among the process's results and the needs for it:

- Suboptimal structure and responsibility distribution in the procedure. The being of organizational fragmentation, featured by multiple organizational flaws, which is oftentimes exacerbated by the shortage of their formalizations (Koçyiğit and Akkaya, 2020; Sahoo, 2021);
- Ineffective and undeveloped data system supporting the process of business. There stands data fragmentation, featured by several data gaps and flaws and the utilization of several, irrelevant information means (Tiupakov & Olifir, 2019; Chen & Sivakumar, 2021);
- Shortages of formalized exchanges of data, the vast outbreak and prevalence of the oral means of passing data with all its innate drawbacks (Zhang et al., 2021);
- Shortage of standard ways in the transmission and collection of data, complexity, duplication, redundance and simultaneous ineffectiveness of the documents' forms applied in the processes



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- of business;
- Shortages of enough and efficient supervision over the execution of the process or interconnection of the results of control with the motivation system.
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