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SURVEYING THE EFFECTIVE INDICATORS ON PERFORMANCE EVALUATION IN CIVIL PROJECT-BASED ORGANIZATION USING BSC FROM STRATEGIC VIEWPOINT

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ABSTRACT

Project-based organizations have the projects as the main element of their operation. One of the challenges in the way of project-based large organizations is lack of general indices and indicators to assess the performance. This is due to the fact the majority of these organizations rely only on one or few indices such as timely delivery of project. Over emphasis on one or two indices diverges the organization from its main goals and the advantages of performance evaluation? Nowadays, many believe that there are factors other than time, cost, and quality in project performance evaluation. There is an emerging trend of using managerial methods that are more compatible with project management. The present study surveys the findings of case studies on activists of major project management. To this end, the study was carried out on Iran Developer Design and Execution Management Co. (called Design and Execution) as one of the largest project-based companies in Iran. The main mid-objectives pertinent to the factors effective on performance of project-based organization were identified using BSC (one of the novel methods for performance evaluation). The main indices of performance evaluation in Design and Execution Co. were determined from financial, customer, internal processes, and growth and learning viewpoints.

Keywords: *Performance Evaluation, BSC, Indicators, Strategy*

INTRODUCTION

Performance evaluation systems designed to lead the organization toward its goals more intelligently have adopted new forms in the recent years. However, using an applied model in large organization in national operational project markets surely needs specific changes and modification in the system. Due to high pace of changes and the fluctuating environment, each project is unique regarding the problems it encounters. Large number of major civil and infrastructural projects in Iran has been triggered in the recent years and management problems that in most of the cases lead to delay in delivery or inconsistency highlight necessity of applied studies, including the present one, to examine all management issues encountered in doing such projects in Iran. Such studies are at preliminary stage in Iran and there is still long road ahead to reach a clear perception of the issue and extract national standards.

Performance Evaluation

Performance evaluation is the process through which performance of a specific period is assessed, measured, evaluated, and judged.

Neely *et al.*, (1995) defined performance as the process of quantifying to measure effectiveness and efficiency of the way tasks are done. Performance evaluation at organizational level is synonym with effectiveness assessment. By assessment, the extent to which goals and plans are realized through an efficient operation and activity is meant.

Objectives and Main terms of Performance Evaluation

Objective of performance evaluation is to evaluate and make judgment regarding performance within a specific time period. In other words it is the process of quantifying and measuring effectiveness and efficiency of doing tasks (Neely *et al.*, 1995). On the other hand, performance evaluation is to measure through comparing the real and ideal situations based preset indices with specific features (Khaki, 2003). Khaki explains performance as an evolving stage-cyclic process that assesses the current situation in a specific field of management using computable indices and then the collected information are judged and

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measured using predefined standards (Khaki, 2003). Concerning with importance of performance evaluation it is notable that permanent improvement of performance of organization leads to great deal of synergy, which in turn results in improvement and development of organizational growth opportunity. Governments, organizations, and institutes are eagerly seeking developing synergic forces. Permanent development is not possible without surveying and learning about the extent of development and realization of goals, without detecting the challenges ahead of the organization, and without collecting feedback and information regarding progress of the codified policies and the area that urgently need development. All these goals are not achievable without measurement and assessment. It is a taken for granted fact that performance of a business can improve when it is measured by integrated, balanced, and formulated measures. Although the concept and nature of performance management is rooted in business performance improvement, it leads to poor management and threaten the business when it is designed and executed improperly (Nudurupati *et al.*, 2007). Performance evaluation of public organization is a continuous process in the developed countries nowadays. It is now a key element in national programming system of these countries. Neely reported that more than 3600 articles have been published between 1994 and 1996 regarding performance evaluation; which is a revolution per se (Neely, 1999).

Performance System and Process

Regardless of the model and pattern used for performance evaluation process, following steps must be taken:

1. Codifying the indices, aspects, and pertinent axes and setting the measurement unit;
2. Weighting the indices regarding their importance and maximum possible point;
3. Standardizing and determining preferred condition for each index;
4. Measuring through comparing actual performance at the end of assessment period based on preset standards; and
5. Extraction of results and interpretation.

Indices highlight the path of the organizations toward realization of its goals. What we first encounter with in codifying the indices are vision, mission, macro-goals, long/short-term strategies, operational programs, and major activities. The codified performance evaluation indices must have the features of a D&SMART system.

Where

S stands for specific: the index must be specified, clear, and determined. That is, the index must be comprehensive, transparent, simple, clear, and explicit as it must convey single interpretation.

M stands for measurable: the index must be measureable easily. That is, in addition to qualitative performance, the index must be qualitatively defined and expressed through qualitative variable.

R stands for realistic: the index must be realistic. That is, it must be pertinent to activities, missions, strategies, and approaches of the organization and also key and sensible fields of performance of the organization.

T stands for Time frame: the index must have specific time frame with specific assessment period.

D stands for database: the data and information must be stored and accessible in a database.

In light of the shortcomings of traditional performance evaluation methods, which are mainly concerned with financial elements, modern performance evaluation tools take into account non-financial indices such as quality, customer satisfaction, innovation, and so on. These indices, in practice, act as driving forces of financial performance (Bilitici and Nudurupati, 2002). Some authors have proposed that a combination of indices (financial and non-financial) must be utilized; still the problem is to find an easy way to find correlation between the indices and their weight and value in the set of indices (Basidor, 1997).

A Preferred Performance Evaluation System

Some features of a preferred performance evaluation system are mentioned blow:

It must be a support for strategic goals and balanced. In addition, it must prevent division-based optimization or focus on few performance indices. Finally, it must cover comprehensive performance indices and easily accessible.

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Balanced Score Card - BSC (1992)

One of the well-known and recognized performance evaluation models is BSC, which was introduced by Kaplan and Norton in 1992. The technique was later developed and improved. The model recommends that each organization must adopt a set of balanced indices for performance measurement; so that it must grant a general view of four key aspects of the organization. These four key aspects answer the four key questions:

1. How the stakeholders see the organization? (Financial aspect)
2. What areas need performance evaluation? (Internal business Process)
3. How the customers see the organization? (Customer aspect)
4. How to improve and create value? (Learning and innovation aspect)

Knowing the limitations of available performance evaluation methods at the time, Robert Kaplan and David Norton, professors at Harvard University, introduced BSC as a modern managerial tool for performance evaluation in an article published in “Harvard Management Journal- 1992”. BSC nowadays is one of the top 15 highly accurate managerial tools in 22 countries. The main idea of BSC is that no single measure can be a transparent reflection of performance of an organization.

Development of BSC

Traditional measurement systems for business performance evaluation are mainly designed for short-term financial goals. Such systems have been proved not be effective to deal with issues that modern enterprises encounter with.



Figure 1: BSC Model

Moreover, more attention to the stakeholders' interests has ensured the organizations that the adopted strategies are translated into pertinent activities (Ahn, 2001). To survive the age of information, organizations need proper measurement and management tools suitable for their strategies and capabilities. The disappointing fact is that, despite the believe in strategies concerning with customer-relationship strategies, fundamental merits, and capabilities of organization, most of them have based their performance evaluation merely on financial measures (MacIver, 2003). Perceiving the needs for integrated management system that encompass traditional measures and qualitative performance indices, Robert Kaplan and David Norton developed BSC in 1996.

Their goal was to develop a framework to translate the strategy into performance. The card is a strategic management system based on measurement that makes alignment between the organizational activities and the strategies by translating the perspective and strategy of the organization into inverse strategic-centered goals and standards. Moreover, performance evaluation as to realization of goals over time is done through creating illustrative image of health condition of the organization. To put it another way, BSC is a set of measures that yields a real time and comprehensive insight into the business. In addition

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to financial measures that represent result of the past action, BSC takes into account supplementary operational measures as to the customer' satisfaction, internal processes, improvement and innovation activities. BSC enables the manager to observe the organization from four key aspects:

1. How the customers see the organization? (Customer aspect)
2. In what areas the organization must be the best? (Internal business Process)
3. Do we can keep creating value and improve? (Learning and Growth aspect)
4. How the stakeholders see the organization? (Financial aspect)

Project, Project Management, and Project-based Organizations

Project is a set of temporary activities to meet a commitment, to develop a product, or to launch a service. The term “temporary” highlights the fact that the projects have specific initiating time and are supposed to meet a specific deadline (Aladpoush, 2003). Project is defined to organize human force, raw material, and human resources in a specific manner and to carry out a specific set of unique activities with specific features, cost, and term so that it results in a profitable change by realizing pre-set qualitative and quantitative goals (Turner, 1999). The term “project-based organizations” refers to a wide range of companies that create temporary systems to accomplish a project. These organizations in the recent years have emerged as a specific form of organization (Nudurupati *et al.*, 2007). Project management is the technique of guiding and coordinating human resources and the materials throughout the term of project using modern management techniques so that the preset goals become achievable within the time, cost, place, quality, and cooperation scopes (Kers Hendrikson)

Project-Based Organizations

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Alignment of Project Management with BSC

Doubtlessly, elements of projects and proper and scientific management of these elements is not feasible by traditional project management techniques given the breadth, complicacy, and diversity of projects. A project, therefore, must be managed based on project management science and development of its boundaries, within the time cycle of the project. Project-based organizations, nowadays, employed project management body of knowledge (PMBOK) to pursue main goals of their project. According to PMBOK, project management covers 9 fields of knowledge and management as follows:

1. *Integrated Project Management*: Describes the required processes to ensure coordination between different elements of the product including initiation, program implementation, and completion of the project.
2. *Project Limited Management*: Describes the required processes to ensure that all the needed activities are covered and that no unnecessary job is done. It includes illustration of project development, development and control limits, and definition and control of activities.
3. *Project Time Management*: Describes the required processes to ensure that the project meets the deadlines; such as defining relationship between activities, estimated time requirements, and developing and controlling time schedule.
4. *Project Cost Management*: Describes the required processes to ensure that the project is accomplished within the dedicated budget; including cost estimate, budget, and cost control.
5. *Project Quality Management*: Describes the required processes to ensure that all effective necessities to implement the project (e.g. programming, guarantee, and quality control) are met.
6. *Project Logistics Management*: Describes the required processes to ensure that essential goods and services for project are procured including processes like logistics control and programming, equipment and documents management, demand and supply management, supplier selection, subcontractors assessment and management.

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7. *Project Human Resource Management*: Describes the process to ensure the best way of employing people in the project including defining organizational structure of project work forces, how to attract new forces, how to assign job to the forces (matrix structure), organization, formation, and development of project team.

8. *Project Communication Management*: Describes the required process to ensure proper generation, collection, dissemination, and distribution for information including communication programming, information management, information control, effectiveness report, and formal completion of the project.

9. *Project Risk Management*: Describes the process that deals with determining and analyzing proper reaction to deal with project risk including risk definition, estimation, quantification, and adopting proper reaction to control and react to the risk.

Given the different fields of project knowledge management and framework of BSC, the connection between these nine principles of project management and the four principles of BSC is evident. As listed in Table 1, all aspects of project management are covered by BSC framework.

Table 1: Conformity between main processes of project management and the aspects of BSC

Processes of project management and aspects of BSC	Integrate management	Limitations management	Time management	Cost management	Risk management	Quality management	Human management	Communication management	Logistics management
Financial				*					
Customer		*	*					*	
Internal processes	*				*	*		*	*
Learning & Growth	*						*		

Excellence model of project-based organizations and BSC

All the aspects of excellence are surveyed by excellence model for project-based organizations. Along with determining the stakeholders, expectation and framework of each stakeholder are described and one or more measure is defined for each stakeholder and then assessments are carried out based on the measures and sub-measures (Nejabat *et al.*, 2007).

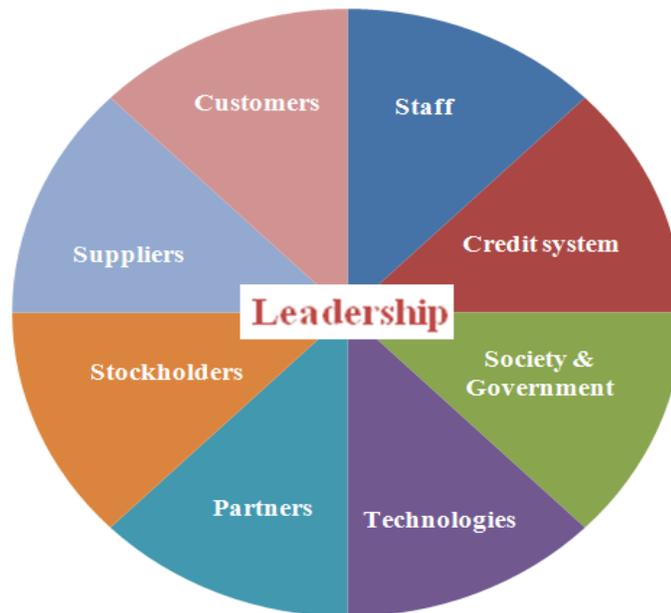


Figure 1: Excellence model of project-based organization

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BSC also functions as a flexible performance evaluation system with excellence model. Table 2 lists alignments between BSC and excellence model for project-based organizations.

Table 2: Alignment between BSC and excellence model for project-based organization

Elements of excellence model or project-based organizations	Aspects of BSC
Creditors	Financial
Stakeholders	
Society and government customer	Customer
Suppliers	
Technology	Internal processes
Business partners	
Employees	Learning & growth
Leaders	

Determining Missions, Perspectives, Strategies, and Macro-Goals of the Organization

The first step in using BSC is to determine mission, perspective, macro/strategic goals of the organization. To this end, the available documents provided by the organization, official bodies, and the board of directors are used. Afterward, the mid-term goals are determined through interviewing and the assessment of indices is codified.

The main objective of this step is to identify the mid-term goals based on the strategy, which in turn is used to determine proper indices. The final result of this step is recognition of the objectives of the organization.

Mid- Goals and Indices

Financial aspect of BSC focuses on two strategic goals and meaning including i) development of income opportunities; and ii) improvement of cost structure.

Table 3: Alignment of financial aspects of BSC with Iran Developer Design and Execution Management Co. and the determined indices

Column	1	2
Row	Goal	Indices
of		Establishing effective relations with the board of directors of Social Security Fund to take out loan
Development of l. revenue opportunity	Diversifying financial supplies	Financing and investing to achieve new revenue sources
		Diversifying financing and credit sources through cooperating with banks and public credit institutions (domestic and foreign)
Improvement of l. cost structure	liquidity management	Preparing the ground for participation of private section in medical services in particular
		Diversifying resources by selling bonds for almost completed projects in particular
		Developing business functions in vicinity of medical and institutional projects for further revenue
		Dedicating financial resources to projects based on performance, actual needs, and physical development of each project
		Determining the capacities of financial regulations of the company to make a optimum use of the legal capacities
		Revising the financial resource dedication based on priorities and regulations
		Avoiding starting new projects without enough financial resources
		Optimum use of human forces through contracting, outsourcing, and assignment

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According to these two goals, the organization under study was reviewed to create processes toward realizing these goals. To this end, financial resources are supplied and effective liquidity management is adopted. Each goal is connected to pertinent indices (Table 3).

Customer Aspect

As to customer aspect, BSC deals with goals, and concepts such as price, quality, functionality, selection, availability, and brand name of the organization. In light of this, resemblances of these goals were determined in Iran Developer Design and Execution Management Co. and two goals were set including 1- leadership in supplying medical center construction designing and execution and being recognized as the most productive organization of the private section; and 2- A reliable and trustworthy organization. Each goal was connected to the pertinent indices (Table 4)

Table 4: Alignment of customer aspect of BSC with Iran Developer Design and Execution Management Co. and the determined indices

Column	1	2
Row	Goals	Indices
1. quality, price, functionality and brand	- leadership in supplying medical center construction designing and execution and being recognized as the most productive organization of the private section	Implementing and transferring technical and managerial knowledge developed in the company in favor of national interests (in and outside the country) Institutionalizing researches in medical and institutive structures field (formation of specialized panels, technical and research groups, calling for research papers by holding seminars and so on) Paying more attention to private sector and trying to maximize their role in the projects Improving knowledge of project management in the country Establishing constructive interaction with academic centers Improving transparency and responsiveness (financial, social, legal, and so on) before all stakeholders
2. Brand name and selection	A reliable and trustworthy organization	Obeying the laws and interacting with other national supervising organizations (supervision, accounting, and so on) Conducting economic assessment to develop new projects and plans (value engineering) Fulfilling social responsibility by dealing with social (e.g. unemployment), economic (a safe place for investment), and local problems toward realization of national capacities Employing minimum possible staff in client sector by moving toward outsourcing

Internal Process Aspect

BSC introduces four processes regarding internal process; including operation management (suppliers, production, and delivery), customer management processes, innovation processes, legal and social processes. Concerning with these processes we tried to find resemblances in the company under study and based on experts and contractors' (suppliers) comments the best objectives for managing the processes were determined including 1) permanent improvement of key and main processes (internal development to supply products and services and modifying contract management); 2) reducing project course by stabilizing or improving quality; 3) improving business volume with old customers and finding new customer; 4) prioritizing implementation of projects along with improvement of economic efficiency (commercial value of health centers and clinics); and 5) environment, safety, professional and society's health. Each one of these objectives was connected to indices (Table 5).

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Table 5: Alignment of internal processes aspect of BSC with Iran Developer Design and Execution Management Co. and the determined indices

Column	1	2
Row	Goals	Indices
1- Operational management (suppliers management)	Creating an effective network of consultants and contractors (suppliers)	<p>Giving more weight to key and main consultant and contractors while not neglecting small and new contractors and consultants</p> <p>Improvement of qualitative assessment indices in selecting contractors and consultants</p> <p>Employing competent foreign contractors and consultant to remove shortcomings</p> <p>Adopting a competitive approach in assigning contracts (based on capacity and capability of consultants and contractors)</p> <p>Implementing contractors and suppliers' support program to overcome technical, equipment, and human force shortcomings and so on to enable them offering better services (mainly for special projects)</p> <p>Improving technical grades of contractors and consultants available</p> <p>Empowering consultant and contractors of installation ward and helping improvement competitive power of the contractors to avoid dependency to foreign suppliers</p> <p>Concentrating and controlling all key technical, operations, and equipment processes in on place to avoid parallel works in different and similar projects and reusing equipment in different projects (knowledge management)</p> <p>Implementation of management-operation integrated system (MIS) including standard and professional systems (ISO), office automation, project management, contract management, financial management, performance management, reengineering processes, and so on</p> <p>Outsourcing all non-strategic general and hardware services to private sector</p> <p>Classification of consultants and contractors based on capacity and capability (technical, financial, operational, etc.) and granting contracts based on the classification for better utilization of the contractors' capacity and avoid week predictions in contracts</p> <p>Empowerment and development of HR management relative to project and employer nature of the company</p> <p>Showing eagerness to participate and interact with local bodies for doing the projects</p> <p>Increasing number of partnership contract with foreign contractors/consultants</p>
2. Operational management (production)	permanent improvement of key and main processes (internal development to supply products and services and modifying contract management)	<p>Modifying the contract to transfer the effects of delay or acceleration of project to contractors (creating more commitment)</p> <p>Removing weaknesses of engineering services and designs in contracts consultant studies</p> <p>Improving accuracy of codifying the documents to improve quality of tenders documents and more coordination between contracts terms and projects conditions</p> <p>Emphasizing on comparability of different contract types (e.g. EPC) with type of project and tasks</p>
Operational management (production)	Modifying and changing contracts management	

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Operational management (delivery)	reducing project course by stabilizing or improving quality	<p>Creating an effective management and financial system to attract and motivate contractors to take part in projects</p> <p>Using “trustee” contractors types for variety of unknown contracts (technical, operational, economic changes, and so on)</p> <p>Employing international consultant and experts to remove problems</p> <p>Taking measures to accelerate feasibility studies for health projects</p> <p>Using construction project management tools such as: value engineering, Earned Value analysis (created value) for time and cost control</p> <p>Financial projects in a timely manner</p>
	improving business volume with old customers and finding new customer	<p>Taking part in health services projects of Ministry of Housing (as per principle 44 of the constitute)</p> <p>Entering new fields such as development and maintenance of health centers run by Ministry of Health and Treatment</p> <p>Entering medical activities run by the Ministry of Petroleum and other state bodies</p> <p>Entering regional and international projects and developing the business to overseas projects</p>
Innovation management	prioritizing implementation of projects	<p>Prioritizing in hand projects with more physical development</p> <p>Prioritizing projects with special economic and political concerns (for remote and less developed regions)</p> <p>Prioritizing projects based on profit cost indices from Social Security Fund’s viewpoint</p> <p>Prioritizing project operations based deadline and term of licenses (projects of which licenses are terminated sooner are of higher priority)</p> <p>Prioritizing projects based on target population and geographical location of the project</p> <p>Prioritizing projects based on priorities of the Social Security Fund</p>
	improvement of economic efficiency (commercial value of health centers and clinics)	<p>Avoiding unnecessary travels to seek medical attention</p> <p>Covering health and medical needs nationwide</p> <p>Fighting epidemics and outbreak of preventable diseases</p> <p>Expanding regional development activities through improving medical per capita</p> <p>Creating job for a wide range of experts such as physicians and nurses</p> <p>Social environment (influenced population, cultural features, economic development, etc.)</p>
Legal and social processes	environment, safety, professional and society’s health	<p>Work accidents, mortality, financial damages caused by the projects</p> <p>Biological environment (green areas, developing sewage system for health centers, dumping hospital wastes, clean air, etc.)</p> <p>Employing local works forces in projects</p> <p>Better services to local community, economic-cultural development of the regions that the project is carried out</p>

Learning & Growth Aspect

Regarding growth and learning aspect, BSC introduces three strategic goals and concepts to the organizations including i) human capital; ii) information capital; and iii) organizational capital. Based on

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these goals and the experts’ comments, resemblances were determined for the company under study including creating harmony among employees; recruiting, training, and keeping the employees; empowering employees (given the required skills and knowledge); physical infrastructures and IT management; tools for analyzing and transferring information; and culture, coordination, and team works (Table 6).

Table 6: Alignment of growth and learning aspect of BSC with Iran Developer Design and Execution Management Co. and the determined indices

Column Row	1 Goals	2 Indices
Human resources 1-	Harmonizing employees	Concentration and investment in strategic and key professions and developing skills, capabilities, and knowledge of the employees
	recruiting, training, keeping employees and the employees	Paying attention to all professions in the company to ensuring development the required skills, competencies, and knowledge HR management based on project life cycle principle Paying attention to recruitment process of experts and knowledgeable employees for strategic tasks
2. information assets	empowering employees (given the required skills and knowledge)	Development of the process of replacing less knowledgeable employees with candidates with higher education Paying attention to formal training and on the job training (relative to strategic/non-strategic jobs) Motivating and keeping expert forces (relative to strategic and specialized tasks) Improving of general skills or project management/negotiation skills/teamwork/ employees relationship management Improving specialized knowledge of the employees and especially technical, engineering, and operation employees
	physical infrastructures and IT management	Physical infrastructures (the Internet, networks, websites servicers, data management, and so on IT management infrastructures (IT education, IT standards and architectures, R&D, and so on)
	tools for analyzing and transferring information	Financial systems (accounting, payment control, budget, credits, and so on) Institutive and backup systems (automation, personnel, and salary and fee, and so on)

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3. Organizational assets	culture, coordination, and team works	Contract systems (contract controls, automation, contracts, and so on) Using GIS to facilitate more accurate project positioning and designing Connecting payment and bonus system with performance Fostering teamwork to share experience and improvement of communication among the employees and the company Creating and supporting culture of granting authority Creating the culture of permanent progress in the company Supporting the risk-taking culture and being responsive and accountable Clarifying perspectives, mission, strategies, values, and goals of the company to the employees
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CONCLUSION

Continuous progress of different performance evaluation methods among project-based organization at global level indicates high capacity of the assessment methods to help the organization toward implementation of its strategies. Adopting systematic process of performance evaluation based on strategies of the organization is worthy of attention. There is high risk of being misled when the performance evaluation fails to evaluate the organization from strategic viewpoint. One of the proved and well-known methods for performance evaluation is BSC, which is featured with capability to align strategies of organization. To have correct alignment, the strategies must be correctly translated into mid-goals. The alignment was carried out for one of large project-centered organizations (Iran Developer Design and Execution Management Co) and the indices needed for performance evaluation process were obtained.

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