



# Comprehensive objective evaluation of IT process management based on COBIT and Balanced Scorecard

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## ABSTRACT

**Objective:** Given the role of IT processes to enable business processes and achieve organizational objectives and in order to achieve optimal results from information technology investments and avoid waste of resources and the elimination of added activities and processes in the field of information technologies that have not added value in achieving the goals of information technology, the need to determine and prioritize comprehensive goal management processes and information technology is evident. **Methodology:** In this regard, according to the alignment of goals with the objectives of comprehensive business processes and information technology, as well as balance the goals of information technology in all aspects of the organization will be of great importance. For this purpose in this article the COBIT and the Balanced Scorecard were used to set goals and to prioritize the importance of goals, of the survey was carried out among experts and consultants certified by Iranian ICT guild organization and Friedman test was used. **Results:** Finally, comprehensive objectives of IT processes management were ranked within four perspectives “corporate”, “customer”, “internal”, “learning and growth”, and were used in a case study of a Internet service provider company as a part of the evaluation model. **Conclusion:** According to the results of this research, can be prioritize objectives in each fundamental perspective of information technology processes management and allocated the most attention and resources to it.

## 1. Introduction

Nowadays using information and its associated technology (IT) in organizations business activity enabling is crucial. Rapid changes in technology, cause to difficulty in planning and control of information resources and technologies that will lead to increase critical risks to the business.

During the past decade, information technology has played an important role for organizations to achieve their objectives, so the role of IT Processes Management to enabling business processes and achieve organizational objectives is clear and obvious.

To obtain the desire result of using information technology, information technology and related processes must be good managed, and to determine the degree of good managing, IT management processes must be evaluated properly, which it will case to eliminate excess activities and processes in the field of information technology which have not any added value.

Any assessment needs to determine indicator, measure of the indicators, indicator weights, standard desire level and also needs to monitoring and measuring and comparing actual performance against desire standard level and analyzes its results.

In this regard, needs to an evaluation model that has special features to evaluate the strategic alignment of IT processes goals with the business goals in balance manner in main organization perspective and based on proper indicators of each IT processes performance, in order to improve the quality and increase organizational maturity in the use of IT in a organization will be much needed.

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So for providing a model to assess the management of IT processes with the aim of mentioned purpose, combining the Balanced Scorecard (BSC) for balance and alignment with organizational goals and measured results and use of COBIT (for measurement and control of IT processes in order to achieve the IT objectives, which have been used combined, is intended.

IT performance management is often one aspect of achieving the strategic goals of organization and also is as a critical controls aspect of organization. (Kang & Bradley, 2002) However, investment in information technology often leads to unexpected, unintended and undesirable results.. (Van Grembergen & Van Bruggen, 1997; Turban et al., 2001; Tuten, 2009.) Therefore, it is necessary to take appropriate action in order to identify and establish indicator to measure IT contribution in value chain of the organization. (Lomerson & Tuten, 2005)

Nowadays, Business processes are the key to the success of any organization. Thus, having a strong business process management approach is important in organizations, and organizations learned by their experiences that business process management, is a strong investment in facing to rapid environmental changes. Business process management with having multiple models necessary for organization, provides an integrated and systematic approach to the design, implementation and business process management of organizations. (SafarZadeh & Ghoreishi, 2011)

On the other hand, in recent years, facing of the business with challenges of the environmental rapid changes, have been caused that the processes due to the interrelation of its internal factors and its interaction with environment, show much complexity. So organizations for adaption to today complex environment have paid more attention to capability of their business process management. (Wang & Wang, 2006)

In order to achieve long-term success and performance improvement, business processes management should be related to the strategy of the organization. Understanding the business processes strategic environment is essential for processes improvement value, (Hung, 2006) and close strategic relationship between competitive strategy and operational activities is critical. (Rhee & Mehra, 2006)

Balanced score card method as a performance evaluation system with focus to intangible assets which at the present century have particular importance; can enable the organization to use the method in the evaluation model through supervising, control and awareness of intangible assets, if necessary, take action to repair weakness and treat deficiency. This method by translates the vision and strategy of the organization to intelligible phrase, prevent of different understanding and with aligning individual and organizational goals helps to successful implementation of the strategy. (Kaplan & Norton, 2004)

Balanced Scorecard (BSC) is a new, multi-perspective approach to performance evaluation and management control which specially, has been related to organizational strategy. On the other hand for organizations, internal processes improvement and focusing it on strategic objectives is essential. Managers can use processes as a strategic key to achieve world-class performance and use BSC to achieve and maintaining strategic success. (Alvandi & Mansouri, 2007)

Control objectives and related information technologies or shortly COBIT, is a governance framework, which are widely used by managers while information in the organization are used to achieve business goals. (Heschl, 2004)

Alignment of IT strategies with business strategies in organization, provides possibility of development through create potential and use of new opportunities of the business environment. To implement IT governance effectively in enterprises needs to evaluate their current performance and should identify where and how improvements can be achieved. Using maturity models makes it very simple and structured approach to assessing how to develop IT governance process in comparison to the fixed scale. (Guldentop, 2007)

Of the most important widespread usage of information technology in organizations and enterprises to increase competitiveness in the market. One of the important bases for gaining competitive advantage earned from ICT investment in business and realizing e-commerce goals, is strategic alliances between the business sector and IT sector. (Grembergen et al., 2004)

Traditional methods of performance evaluation which mainly based on financial and accounting criteria such as benefit of share, assets rate of return, etc., ignores a lot of qualitative criteria such as customer satisfaction. The restrictions of performance evaluation financial criteria caused to need to a new method which could use other criteria in addition to financial criteria to evaluate the performance.. In this regard, Kaplan and Norton introduced balanced scorecard method.

In this method, is considered the customer satisfaction, internal processes and growth and continuous learning in addition to financial analysis.

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## 2. Materials and methods

Considering that the aim of this study was to identify the main objective of the management of IT processes in four dimensions: corporate, customer, internal, learning and growth, the descriptive survey method was used. In identification of IT processes management objectives and its measuring criteria library method was used and for evaluation and ranking of objectives, field method was used.

Statistical society: in this study, field survey was carried out among experts and consultants certified by Iranian ICT guild organization which were around 143 people. To determine the sample size used Morgan table. That is, according to Morgan table in the society 140-person, sample size should be 103. To gathering the initial data for the analysis, a questionnaire was used.

Questions in the questionnaire were prepared in both public and private sector. The public questions was includes age, gender, work experience and education level of respondents and the specific questions was included all related objectives of IT processes in four dimensions: financial, customer, internal and learning and growth which investigated. In order to determine the validity, the 10 respondents on a limited basis as well as 3 professors were distributed, to decrease its ambiguities as possible and to increase its reliability and validity.

To analyze the data obtained from the samples, descriptive and inferential statistical methods was used. to analyze the data, SPSS software was used. Kolmogorov-Smirnov test was used as well as the normal condition of the data to be estimated and then given that the data did not follow a normal distribution of Friedman test was used to test the hypotheses. According to the results, the ranking and the importance of information technology management objectives were determined.

### 3. Discussion and results

#### 3.1 Findings

COBIT framework is for the development, implementation, monitoring and improving the governance of information technology (IT) and IT management which has international accreditation and has been released by the Institute of IT governance (IT Governance Institute - ITGI) and the Association for Information Systems Audit and Control (Information Systems Audit and Control Association - ISACA)

Therefore, in this study, based on this reference, comprehensive objectives of IT and measuring indicators studied simultaneously in four perspectives and with detailed questionnaire, experts comment have been collected and surveyed which its results were used in the evaluation model.

In public Section questions of the questionnaire, 17.5% of participants were women and 82.5% of the populations of the questionnaire were male, 65 percent of the total population aged between 25 and 35 years, 29.1% between 35 and 45 years and 5.8% have between 45 and 55 years old.

Also, 29.1% of the sample in terms of bachelor, 11.7%, master and 59.2% have a PhD and above broadly. 11.7% of their sample work experience and 5 years, 47.6% between 5 and 10 years, 23.3% between 10 and 15 years, 11.7% between 15 and 50 years and 5.8% were between 20 and 25 years of service.

In Section specific questions of the questionnaire, first parametric test conditions using the Kolmogorov-Smirnov test was used to assess the normality of the data. Test results showed that the condition does not exist for this purpose parametric test for nonparametric test was used to test the hypothesis.

**First hypothesis:** most important objective of the management of IT processes of the company realized investment gains and collection services with IT is gaining strength. To test this hypothesis of Friedman test was used to rank the components.

**Table (4-10). Friedman test**

Average	Comprehensive objectives of IT processes management form corporate perspective
4.42	Alignment of business and IT strategy
3.81	Realized benefits from IT enabled investments and services portfolio
3.78	IT compliance with external laws and regulations
3.67	Management of IT-related business risk
3.07	Transparency of IT costs, benefits and risk
2.26	Commitment of executive management for making IT decisions

0.000 = sig

5 =df

95.02 =X<sup>2</sup>

Friedman test results show the chi-square (95.02) with 5 degrees of freedom in the alpha level of 5% is significant and the null hypothesis is rejected. In other words, the purpose of IT process management of the company is significant. According to the average rating of these rating factors are: Business and IT strategy alignment and commitment to most important goal of the executive management for decisions related to IT is the lowest rank.

**Second hypothesis:** most important objective of the management of IT processes in line with the requirements of the customers IT services and business requirements.

**Table (4-11). Friedman test**

Average	Comprehensive objectives of IT processes management form Customer perspective
1.80	IT services in line with business requirements
1.20	Adequate use of applications, information and technology solutions

0.000 = sig

1 =df

61 =X<sup>2</sup>

Friedman test results show the chi-square (61) with the release of the first alpha level of 5% is significant and the null hypothesis is rejected. In other words, the purpose of the customers IT process management are significant. According to the average rating of these rating factors are: IT services in line with business requirements and the adequacy of the main objective of the program is the solution.

**Third hypothesis:** most important objective of the management of the internal IT processes to empower and support of business processes by integrating applications and business processes is technology.

**Table (4-12). Friedman test**

Average	Comprehensive objectives of IT processes management form internal perspective
4.84	IT Agility
5.72	Security of information and processing infrastructure and application

2.46	Optimisation of IT infrastructure, resources and capabilities	
3.24	Enablement and support of business processes by Integration of applications and technology into business processes	
3.71	Delivery of programmes on time, on budget and meeting quality standards	
5.11	Availability of reliable and useful information	
2.92	IT compliance with internal policies	
0.000 = sig	6 =df	261.46 =X <sup>2</sup>

Friedman test results show the chi-square (261.46) with 6 degrees of freedom in the alpha level of 5% is significant and the null hypothesis is rejected. In other words, the objectives of the internal IT process management are significant. According to the average rating of these rating factors are: Information security and infrastructure applications and processing most important target and then useful and reliable availability of obedience, agility, providing timely planning, activation and support of business processes and finally IT compliance with internal policies and optimizing IT assets, resources and capabilities.

**Fourth hypothesis:** most important objective of the management of IT processes, increase competence and motivation of the IT staff are growing and learning.

**Table (4-13). Friedman test**

Average	Comprehensive objectives of IT processes management form growth and learning perspective	
1.41	Competent and motivated IT personnel	
1.59	Knowledge, expertise and initiatives for business innovation	
0.010 =sig	1 =df	6.56 =X <sup>2</sup>

Friedman test results show the chi-square (6.56) with 1 degree of freedom in the alpha level of 5% is significant and the null hypothesis is rejected. In other words, the purpose of IT process management is significant aspects of growth and learning. According to the average rating of these rating factors are: Knowledge, experience and initiative for innovation in business and the staff are motivated and competent.

## 4. Conclusion

### 4.1 Discussion and conclusion:

In this research, to identify objectives and its operational measures, the cobit5 framework was used and with survey on experts' opinion, were analyzed in terms of importance. Data obtained were analyzed using the Friedman test, leading to ratings and prioritize the objectives were based on their importance. As seen in the below table, comprehensive objectives of the IT processes management in each perspective of corporate, customer, internal, and learning and growth is listed in order of importance.

**Table 1. Comprehensive objectives of the IT processes management in each perspective listed in order of importance.**

Score average of criteria in the case study	Dimension	Friedman Rating	comprehensive objectives of IT processes management
8	Corporate	4.42	Alignment of business and IT strategy
7.33	Corporate	3.81	Realized benefits from IT enabled investments and services portfolio
4.5	Corporate	3.78	IT compliance with external laws and regulations
7	Corporate	3.67	Managed IT-related business risks
8.33	Corporate	3.07	Transparency of IT costs, benefits and risk
8.5	Corporate	2.26	Commitment of executive management for making IT decisions
6	Customer	1.8	IT services in line with business requirements
6.66	Customer	1.2	Adequate use of applications, information and technology solutions
6	Internal	5.72	Security of information and processing infrastructure
7.33	Internal	5.11	Availability of reliable and useful information
6.66	Internal	4.84	IT Agility
6.25	Internal	3.71	Delivery of programmes on time, on budget and meeting quality standards

5.33	Internal	3.24	Integration of applications and technology into business processes
6	Internal	2.92	IT compliance with internal policies
6.33	Internal	2.46	Optimisation of IT infrastructure, resources and capabilities
6.33	Learning	1.59	Knowledge, expertise and initiatives for business innovation
8.66	Learning	1.41	Competent and motivated IT personnel

According to the results of this research, can be prioritize objectives in each fundamental perspective of information technology processes management and allocated the most attention and resources to it.

In company perspective it is clear that the first priority is Alignment of IT and business strategy. In customer perspective, service delivery of IT services in line with business requirements is more important. In internal perspective, Security of information and processing infrastructure is the main target.

In growth and learning perspective, Knowledge, expertise and initiatives for business innovation has higher importance.

of results of this study, used in assessment of achievement to the objectives of an information technology company which providing fixed communication services were used that the results of its objective achievement level is presented in the following diagram. Using the evaluated results, made available in prioritization and allocation of resources to different areas and projects in order to achieving important objectives.

### Status of realized objectives of IT processes management in the ISP case study.

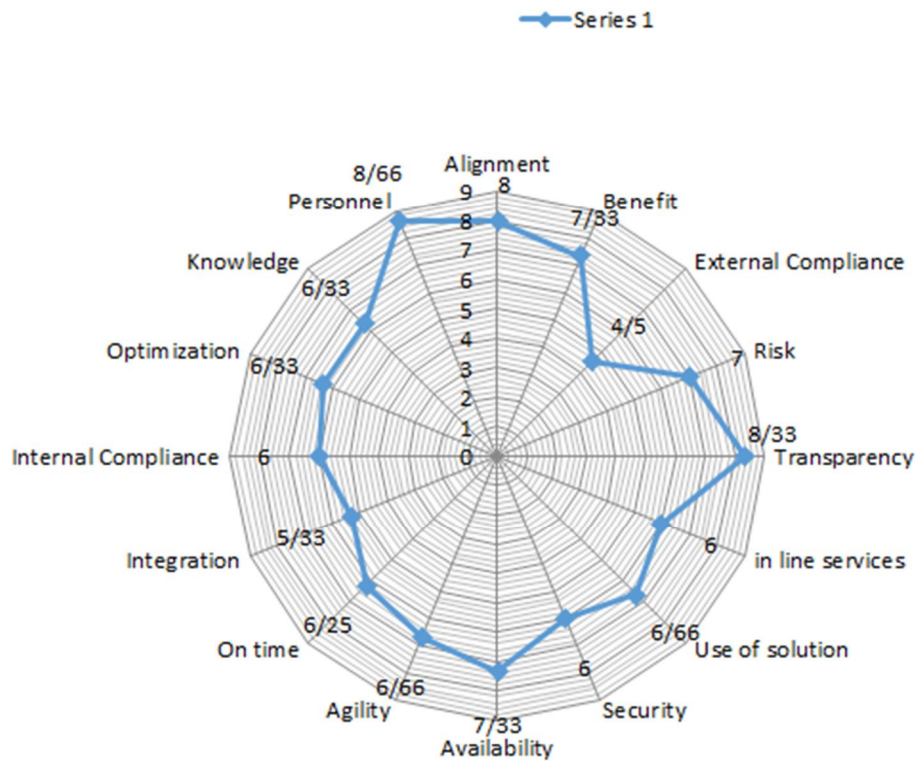


Figure 1. Status of realized objectives of IT processes management in the ISP case study

It is recommended to future researches that follow development of objectives measuring criteria and influence of each IT processes on the objectives.

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