

## **An Investigation of the Impediments of Performance-Based Budgeting in the National Iranian Gas Company**

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**Abstract:** One of the basic problems in non-performance-based budgeting system is the fact that the budget is non-operational and unclear and it incurred lots of expenses to many countries including. Formulating budget to estimate and measure the performance of state-run companies and organizations and it is considered as a useful management tool. So, in formulating budget, the specific strategy of each organization should be taken into consideration with all cash profitability aspects and management perspectives in establishing organization. One of recent reform in budgeting system of countries is movement toward performance-based budgeting. Considering failure in performance-based budgeting in National Iranian Gas Company (NIGC), a problem proposed about the fact that what are the obstacles in disposing performance-based budgeting in this company, attempt has been made to estimate the effect of non-impact system of Activity Based Costing (ABC) and other items separately on disposition of performance-based budgeting.

**Key words:** Operational budgeting, activity based costing, the impediments of performance-based budgeting, expenses, perspectives

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### **INTRODUCTION**

Since the 1980s, Performance-Based Budgeting (PBB) has been adopted by many countries to improve accountability and the effectiveness of public programs. The US congress passed the chief financial officer act of 1990 and the Government Performance and Results Act (GPRA) of 1993 which together laid down the legislative foundation for PBB reforms. PBB has also advanced rapidly in other countries in the Organization for Economic Co-operation and Development (OECD) as a way to make government more competitive and cost-efficient and as a response to cynical taxpayers who demand more accountable government spending. Many have expanded the practice of PBB and introduced new legislation that requires performance measurement and benchmarking.

In the countries that have used performance measurement for a number of years, many have also shifted to report outcomes and build a stronger link between performance and budgeting. Perrin (2003) (following the principle of the GPRA, Taiwan and China (Guangdong Province) also adopted PBB in 2001 and 2003, respectively.

Though studies have been conducted to examine PBB's immediate impact on management practices and decision making (Willoughby and Melkers, 2005; Jordan and Hackbart, 1999; Joyce, 1993) few researchers have explored how it may affect government.

Spending behaviors, after all, PBB scrutinizes public program performance and should affect how these programs behave in resource allocation decision making and curbing wasteful spending. This is especially critical during periods of rapid growth in debts and deficits as governments struggle to control spending (Hou *et al.*, 2011).

The antecedent of PBB dates back to what was called "performance budgeting" over 60 years ago which was a government management reform initiated in the late 1940s and early 50s for purposes of efficiency and effectiveness of input. But the 1940.50s reform did not stand on a practical ground because the country was then harvesting the "fiscal dividend" from the revenue system continued from WWII (Schick, 1990).

However as is true with other budget reforms, performance budgeting did not die out completely; it left traces here and there (Schick, 1971).

One of the basic problems in nonperformance-based budgeting system is the fact that the budget is nonoperational and unclear and it incurred lots of expenses to many countries including the annual budget deficit of the government trillion which is many thousands of billions.

This research is to investigate the effects resulted from way of performing each one of the factors affecting on pleasant deployment of performance-based budgeting in national in structural form and or approach based on pre-supposition taken from theoretical studies of this

research. In fact, we are not looking for factors that affect operating budget generally but we are trying to measure the components related to pleasant deployment of performance-based budgeting to measure in the Iranian gas transfer company. Considering the researcher's complete understanding about the status of company and not conducting performance-based budgeting of Iranian Gas Transfer Company is determined as a dependent variable. The pleasant result of study is to understand existing barriers and problems in conducting modern method based on performance and evaluating efficiency rate of each one of them will be compared. At last, it provides opportunity to remove and or at least to decrease the mentioned effects of the company.

**The origins of performance budgeting:** The concept performance budgeting has a long history. Although, elements of program budgeting were in evidence in the United States prior to World War II (Axelrod, 1988). The term performance budgeting is more clearly associated with the 1950s reforms in the United States. The latter attempted to develop performance information for budgeting and to reorient the US federal budget process from its focus on inputs to one that also included the outputs derived from using those inputs. The approach really took off when the Hoover commission on the organization of the executive branch of the government in 1949 promoted this approach and encouraged its widespread implementation. The budget and accounting procedures act of 1950 required agency heads. In coordination with the bureau of the budget to support their budget requests with information on performance and program costs by the effects of this changed perspective. It should be noted that even from these beginnings, the Hoover commission used the terms program budgeting and performance budgeting almost synonymously (Dimond, 2003).

**Consolidation and refinement of program budgeting:** Despite the demise of the full-blown PPBS, program budgeting continued to be applied in the United States in a less-ambitious form. The passage of the congressional and impoundment act of 1947 advanced multiyear budgeting; budget classifications by mission, function and program; the use of sophisticated analytical techniques by the congressional budget office improved accounting and information systems. This approach has been persisted to the present day and resulting in a situation where it is possible for federal budget decision makers to have data on objects of expense.

The Hoover commission also publicized the concept of a "performance budget" in recommending" that the

whole concept of the federal government should be fashioned by the adoption of a budget based on functions, activities and project; this we designate a performance budget".

However for some of the critics the data on programs and performance in just window dressing, with decisions being made based on traditional line-item objects of expense.

Moreover in the meantime, the program approach to budgeting spread to other countries. With the 1965 publication by the UN of a manual for program and performance budgeting was reinforced as a tool of development planning. In the 1960s, nearly 50 countries introduced variants of program and performance budgeting, although never on the scale of the United States. This then spread to developing countries, so that by the end of the 1960s, nearly all Latin American countries, several Asian countries and some African countries had introduced versions of program budgeting. On the whole, the impact on-budget decision-making has been disappointing-perhaps indicating that for many developing countries, its adoption was premature. The UN manual, heavily based on US experience, did lay down preconditions for successful performance budgeting in developing countries: sound budgetary operating procedures; financial discipline; efficient methods of recording and reporting financial and physical data and close coordination between the central budget agency and other government agencies. All, pr most, being typically absent in developing countries (Dimond, 2003).

Not only in recent years but also in recent decades, several attempts have been made to encourage budgeting process toward measuring operation and evaluating activities results and modern methods to be adopted to make managers more accountable (Dimond, 2003).

Therefore, fundamental changes has emerged in institutions and public financial management techniques and make possible financial accountability of each executive unit based on outputs of it and its inputs using executive performance indicators (Tyrone, 2004).

**The privileges of operational budget:** In the process of operational budgeting, current leaders as the heads of an organization are involved to assign the individual programs to subsidiary executives and managers.

This process entails a feedback loop in which the correct and authentic information is at the disposal of senior managers in order to manage there-planned activities and developments. Budgeting leads to more efficient utilization of resources in an organization. Executives and managers are capable of using resources

in terms of achieving the established goals as is expected to exploit the budget more effectively. The followings are the most significant privileges of budgeting.

**To enhance the public accountability:** Politically discussing, although it is possible for many estates to access to information of the performances, it results in various forms of budgeting performance such as budget documents, strategic planning and public report performance.

**Management for better performance:** Information about performance is used by managers wishing to increase their operational efficiency of plans and working processes. To encourage managers to use performance-based budgeting and it is the most direct link between performance and increase efficiency and quality of services.

**To improve resource allocation:** In performance-based budgeting, resource allocation is related to performance indicators relate. Strategic planning to resource allocation is one of the main requirements of resource allocation based on objective.

**To involve all levels of management:** Performance-based budgeting is a progressive process that includes all manager of an organization from the top level to plan and development managers. This process includes a feedback loop which provides senior manager with appropriate information to deal with management activities better.

**A valuable tool to recognize:** Performance-based budgeting is a valuable tool to develop a fundamental and basic understanding of the integration of used resources and established performance. Plan officials enjoy an opportunity to study the internal interactions between resources and the expected results. This experience improves the general management of plans in a pleasant manager.

**Infrastructure of comprehensive performance management and starting point on organizational efficiency:** Performance-based budgeting can be an infrastructure to create a comprehensive system of performance management in the context of an organization's strategic plan. A performance-based budgeting shows that how does the amount of budget affect performance of a plan (such as activities, indicators, processes and outputs). Also, how this performance affects final results.

**The possibility to adopt an objective and effective decisions:** Performance-based budgeting facility the possibility to adopt an objective and efficiently decisions in providing services resources outside of organization. Managers of state-run organizations should know the total costs of an activating (including all direct and overhead costs) and level of results which have been achieved so far.

#### **Hypotheses:**

- There is a meaningful relationship between disposition barriers of performance-based budgeting systems and using Activity-Based Costing (ABC) System
- There is a significant relationship between the barriers and performance-based budgeting and the lack of standard forms and operation calculation standards and obstacles to disposition performance-based budgeting
- There is a significant relationship between executive instructions and lack of legal prosecutions and executive instructions and barriers to deploy operational budgets
- There is a significant relationship between the viewpoints of officials and executives about efficiency of performance-based budgeting and barriers to deploy performance-based budgeting
- There is a significant relationship between the lack of comparison the amount of the approved and spent amount in performance-based budgeting and barriers to deployment of performance-based budgeting

#### **MATERIALS AND METHODS**

To achieve the objectives of research, existing problems and barriers described and data trend collected without manipulation. This present research is formulated in two separate parts. In the first part, documentary and library studies and in second part it is field researches. Also as attempt has been made to study present status of the variables using data collection in the viewpoints of experts and specialists and they are classified in the row of descriptive-survey studies.

To collect data and information to analyze, questionnaire used. The questionnaire o has 34 questions includes 6 general (identification) questions and 28 specialized (main) questions and they are without name. And also questions are designed in closed manner with 5 answers with Likert 5 internal measurement (very much, much, average, low, very low) and to make qualitative data into quantitative data, to each one of choices as number is considered in order of rank one to 5 data. The reason to

use interval measurement is that if respondents do not have possibility to answer yes or no, they have more flexibility in answering questions.

Statistical population of the study includes managers' unit enquiries and experts of National Iranian Gas Company.

Sampling method in this study is simple random. In simple random sampling, each one of determined elements of society enjoys equal chance to be chosen. In this method, determined individuals or things are chosen randomly from society list. And also to choose sample volume, considering limitedness of statistical population and the fact that questions of questionnaire are qualitative, number of statistical sample achieved using the following equation (KOKERAN formula):

$$n = \frac{Z^2 pqN}{d^2 (N-1) + Z^2 pq}$$

Due to the fact that questions are qualitative p and q, respectively are the possibility to be successful and not successful. By substituting p = q = 0.05, the maximum number of samples will be achieved. N is the total number of statistical population and it includes 109 individuals and  $\alpha = 0.05$  and consequently  $z_{\alpha/2} = 1.96$ . Considering the above quantities, statistical sample rate is calculated 77 persons and they are chosen using random sampling of total population. To estimate reliability of questionnaire,  $\alpha$  Cronach Method is used. In fact, about questionnaires that have multiple chances it is suggested to use  $\alpha$  Cronbach coefficient formula. Cronbach coefficient is between 0 and 1 and in fact it is correlation coefficient of data in the different times, number 1 is the maximum correlation and number 0 is the minimum correlation.

In this study,  $\alpha$  Cronbach coefficient is correlated using SPSS Software and it is equal 0.93. Considering the fact that reliability coefficient of the questionnaire is confirmed. Cronbach formula is as follows  $\alpha$ :

$$r_{\alpha} = \frac{j}{j-1} \left( 1 - \frac{\sum S_j^2}{S^2} \right)$$

Where:

J = Number of question subset of questionnaire or test

$S_j^2$  = Subtest variance jth

$S^2$  = Total variance of test

**Descriptive and inferential statistics of specialized questions:**

In this study, at first attempt will be made to presents statistics related to each one of the factor and then it address the mean graphs of them and having achieved average of questions related to each factor,

scores of the present status of each T factor of each factors will be calculated. Using test and barriers to deploy performance-based budgeting will be studies in National Iranian Gas Company. We make decision about 5 hypotheses of the research. In this study, at first, indices related to each one of the factors are presented in the graph separately (Table 1).

**Normal distribution test of answers:** In order to test the normal distribution of responses to each factor, (Kolmogorov-Smirnov test) were used.

To test hypothesis we can use t responses to test the hypotheses of test. Test results for each of the parameters are as follows:

- The first test is normal (main hypothesis) and reason to reject the claim is that the distribution is not normal:  $p > 0.05$ ;  $z = 1.041$
- The second test is normal (hypothesis II) and reason to reject the claim is that the distribution is not normal:  $p > 0.05$ ;  $z = 0.88$
- The third test is normal factor (third hypothesis) and reason to reject the claim is that the distribution is not normal:  $p > 0.05$ ;  $z = 0.790$
- The fourth test is normal factor (fourth hypothesis) and reason to reject the claim is that the distribution is not normal:  $p > 0.05$ ;  $z = 0.875$
- The factor test is normal (hypothesis v) reason to reject the claim that the distribution is not normal:  $p > 0.05$ ;  $z = 0.999$

**First hypothesis testing (main):**

- $H_0$ : there is not a meaningful relationship between barriers to deploying performance-based budgeting and not using Activity-Based Costing (ABC)
- $H_1$ : there is a meaningful relationship between barriers and lack of budgeting, operational Activity-Based Costing (ABC) System

The mean of the total sample is 3.31 and the histograms are presented in Fig. 1 t-test. In this test, the null hypothesis and the basic premise are as follows:

- $H_0$ :  $\mu \leq 3$
- $H_1$ :  $\mu > 3$

Table 1: Indices central and distributive assumptions

Variables	The first hypothesis	The second hypothesis	The third hypothesis	The fourth hypothesis	The fifth hypothesis
n	77.00	77.00	77.00	77.00	77.00
Mean	3.31	3.36	3.24	3.19	3.08
Median	3.40	3.20	3.33	3.28	3.00
Mode	2.80	3.20	2.83	3.57	2.80
Variance	0.62	0.58	0.37	0.52	0.39
Range	3.40	3.60	2.83	3.14	3.00
Minimum	1.60	1.40	1.83	1.71	1.80
Maximum	5.00	5.00	4.67	4.86	4.80

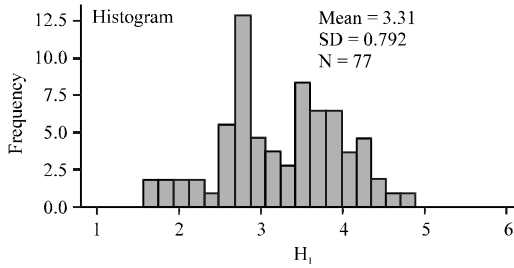


Fig. 1: Average data for the first hypothesis

To examine the main hypothesis 1 as you can see in this test, the p-value is equal to 0.001 because this amount is  $<0.05$ . Null hypothesis is rejected and it means that the performance-based budgeting is not using Activity Based Costing (ABC) as a barrier to the deployment of the operating budget of the gas companies to be identified.

**The second hypothesis test:**

- $H_0$ : there is not a significant relationship between the lack of cost forms and standard of calculation operation and barriers to deploy performance-based budgeting
- $H_1$ : there is a significant relationship between the lack of cost forms and standard to calculate operational and barriers to deploy operational budgeting.

In total, the mean of this factor equal to 3.37 and result of the t-test table are presented in Fig. 2. In this test, the null hypothesis and the basic premise are as follows:

- $H_0: \mu \leq 3$
- $H_1: \mu > 3$

To examine the second hypothesis as you can see in this test, the p-value equal to 0.000 because this amount is  $<0.05$ . Null hypothesis and it means that lack of using cost Forms and operation calculation standards are considered as barrier in deploying performance-based budgeting in National Iranian Gas Company.

**The third hypothesis:**

- $H_0$ : There is a not significant relationship between operating instructions and lack of legal prosecutions and executive instructions and barriers to deploy performance-based budgeting
- $H_1$ : There is a significant relationship between operating instructions and lack of legal prosecutions and executive instructions and barriers to deploy performance-based budgeting

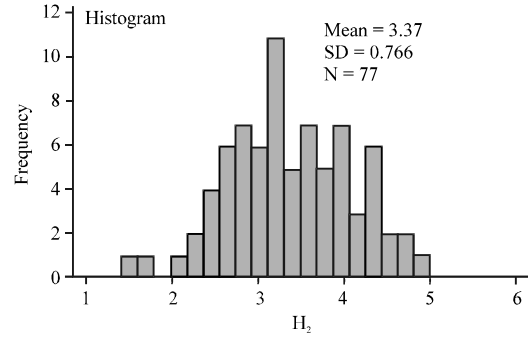


Fig. 2: Average data for the second hypothesis

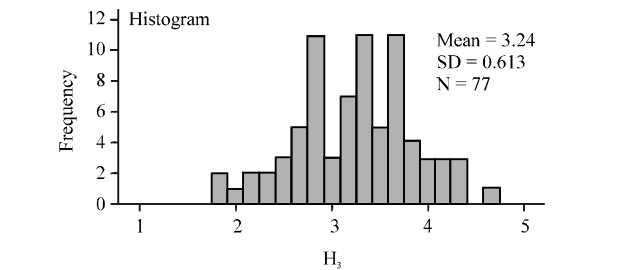


Fig. 3: Average data for the third hypothesis

In total, the mean of this factor equal to 3.24 and result of the t-test table is presented in Fig. 3. In this test, the null hypothesis and the basic premise is as follows:

- $H_0: \mu \leq 3$
- $H_1: \mu > 3$

To examine the third hypothesis 3 as you can see in this test, the p-value equal to 0.001 because this amount is  $<0.05$ . Null hypothesis is rejected and it means that lack of legal prosecution in executive instructions is considered as a barrier in deploying performance-based budgeting in National Iranian Gas Company.

**The fourth hypothesis:**

- $H_0$ : there isn't a significant relationship between the performance of officials and executives of performance-based budgeting deficiency and barriers to deploying performance-based budgeting
- $H_1$ : there is a significant relationship between the performance of officials and executives of performance-based budgeting deficiency and barriers to deploying performance-based budgeting

In total, the mean of this factor equal to 3.19 and result of the t-test are presented in Fig. 4. In this test, the null hypothesis and the basic premise are as follows:

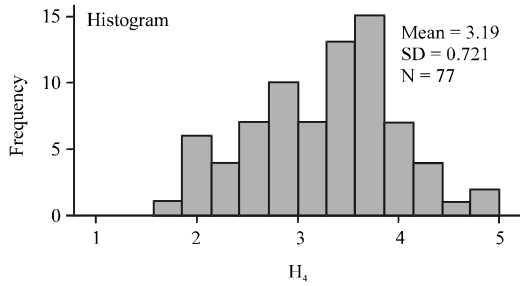


Fig. 4: Average data for the fourth hypothesis

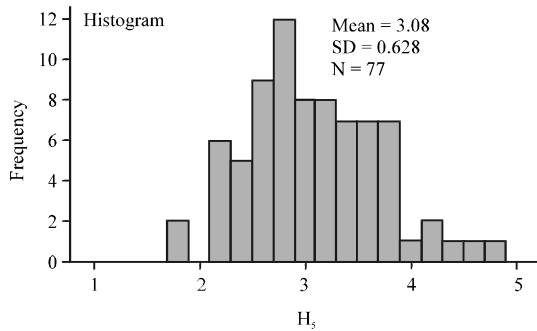


Fig. 5: Average data for the fifth hypothesis

- $H_0: \mu \leq 3$
- $H_1: \mu > 3$

To examine the fourth hypothesis as you can see in this test, the p-value equal to 0.023 because this amount is  $< 0.05$ . Null hypothesis is rejected and it means that viewpoint and performance officials and executives of operational budgeting deficiency is not considered as a Barriers in deploying operational budgeting in National Iranian Gas Company (Fig. 4).

**The fifth hypothesis:**

- $H_0$ : there isn't a significant relationship between comparing approved and spend cost in the direction of performance-based budgeting and Barriers to deploying of performance-based budgeting
- $H_1$ : there is a significant relationship between comparing approved and spend cost in the direction of performance-based budgeting and Barriers to deploying of performance-based budgeting

In total, the mean of this factor equal to 3.08 and result of the t-test are presented in Fig. 5. In this test, the null hypothesis and the basic premise are as follows:

- $H_0: \mu \leq 3$
- $H_1: \mu > 3$

Table 2: Friedman test output

N	Chi-square	df	Asymp. Sig.
77	25.498	4	0.000

Table 3: Variables are ranked in terms of deterrent effect on implementing performance-based budgeting in National Iranian Gas Company

Ranks	Factor name	Rank average
1	Lack of using cost forms and operations calculation standards	3.44
2	Non using Activity Based Costing (ABC) system	3.36
3	Lack of legal prosecution and executive instructions	3.09
4	Officials and executives viewpoint of operating budgeting efficiency	2.77
5	No comparison of approved and spent costs in performance-based budgeting	2.34

To examine the fifth hypothesis as you can see in this test, the p-value is equal to 0.264 because this amount is  $< 0.05$ . Null hypothesis is confirmed and it means that factor of non comparison of approved and spent costs in the direction of operational budgeting is not considered as a barrier to deploy operational budgeting in National Iranian Gas Company.

**Friedman test:** In order to prioritize and determine the importance of each one of the operational budgeting factors Friedman test is used. Friedman test states that, among other factors, whether a factor is more important than other factors or all factors are the same in term of importance (Table 2).

In this study, the Friedman statistic equal to 25.498 and the error rate is 0.000 which is smaller than the error level (0.05). So in 95% level of confidence, hypothesis of equaling importance of all factors rejects.

After conclusion using “Friedman test” factors affecting in implementing performance-based budgeting in Iranian Gas Transfer Company in terms of barrier and prevention ranked. The results of them are summarized in the following table. Considering the fact that the following factors are described as negative in questionnaire, the higher determined factor rank average it will be proposed as a move detent factor in implementation performance-based budgeting in National Iranian Gas Company (Table 3).

**RESULTS AND DISCUSSION**

Based on proving normal responses, using an average test of population, the research hypotheses were investigated. The following results were obtained:

Rest results showed that not using Activity Based Costing (ABC) system such as not applying cost prize system in budgeting process, not using the company’s cost system based on operations and not using calculation figures based on cost prize budgeting in

preparing annual budget of company and not using a comprehensive system of financial committed accounting is identified as a barrier to the deployment of the performance-based budgeting of the National Iranian Gas Company as well, through freed man test statistic, this barrier is second priority.

Results of test No. 2 showed that lack of legal prosecutions and executive instructions of activity-based budgeting by relevant experts is identified and supervision agencies don't emphasis prosecute preparation of performance-based budgeting, non-consistency of plan budgeting information systems with performance-based budgeting is identified as a barrier as well, through freedman test statistics, this barrier is first priority.

Results of test No. 3 showed that not using cost forms and operations accounting standards including not using forms and standards, mismatch of performance costs with related standards, not using performance-based budgeting items is considered as plan budget infrastructure and as a barrier to the deployment of the performance-based budgeting National Iranian Gas Company as well, through freedman test statistics, this barrier is third priority.

Results of test No. 4 showed that officials and executive's performance and viewpoint about performance-based budgeting efficiency affect less in deploying performance-based budgeting. Considering results of the test average of population is  $<3$ . Thus, it is not considered as a barrier in deploying performance-based budgeting in National Iranian Gas Company.

Results of test No. 5 showed that not comparing approved and spent cost in performance-based budgeting affect less on deploying performance-based budgeting. And considering the t result of test mean of society is lower than mean of number 3. Thus, it is not considered as a barrier in deploying performance-based budgeting in National Iranian Gas Company.

## **CONCLUSION**

The results of the study showed that not using activity-based costing system as an obstacle in disposition of performance-based budgeting in NIGC.

## **SUGGESTIONS**

With respect to final conclusion of determined research and making clear problems of performance-based

budgeting in separate by each hypothesis, the following suggestions are presented to remove barriers and achieve a successful performance-based budgeting system in National Iranian Gas Company and it can be effective in financial concept of plan based of efficiency and also to identify required resources to implement plants and achieve measurement and control criteria. Due to the fact that this method of budgeting is young in Iran, this method has not been performed in Iran completely. By preparation of comprehensive software in organizations such as Shiraz municipality and cultural heritage organization research institute it is performing in pilot way. Performance-based budgeting is one of the efficient methods which have many applications in developed and developing countries in the last decade. Conducting performance-based budgeting has been conducted in most of European countries and states of America including California. From the beginning of 1993, California took action in conducting PBB System in organization (Cook and Lawrie, 2007). Our results in Iran focused on barriers to disposition activity-based budgeting and not conducting activity-based costing system.

While findings indicate that budget officers in the states are generally confident about performance budgeting's potential, at the same time, they note important challenges and problems with implementation. For example, legislative and executive support for performance-budgeting and related performance measurement activities in the agencies is critical. Certain resources are required for successful implementation. Performance-based budgeting and goal-setting activities are new for many organizations. As our prior work has revealed, performance-based budgeting in most states has only been implemented relatively recently (Melkers and Katherine, 1998). Most state agencies have been accustomed to working and reporting in environments where demands for data and evidence about the quality and extent of their responsibilities have been limited to aggregated summary data or "level-of-activity" measures (Lynch, 1995). As more organizations are adopting performance-measurement systems that require extensive goal-setting and measurement activities, many organizations (and individuals) must change.

But change is inherently difficult. It is also a challenge to managers, who must provide guidance for these new activities. Performance measurement generally involves adopting new organizational values, missions, and operating requirements. This means that organizational cultures must change.

## RECOMMENDATIONS

In the end, the following subjects are recommended:

- To Deploy Activity- Based Costing (ABC) System in public and private Companies and organizations
- To use cost calculation figures based on cost price and to compare performance costs with related standard and using financial comprehensive system of accounting by committed accounting method with imposing and conclusion accounting standards in perpetrating company's annual budget statement
- Preparation of hardware and software systems related to financial affair and performance-based budgeting and to present software localization in accordant with condition of company and relevant country
- To use incentive instructions, forms and standards of performance-based budgeting in preparing annual budget of company by related experts and to present accurate definition of result and measurement indicator of expected performance of company
- To hold various training and educational courses in all levels of managers and experts of organization to familiarize them with concepts and capabilities of manpower related to performance-based budgeting, in all-out and comprehensive, applied and constant way and using efficient and specialized human resource in performance-based budgeting
- To hold sessions with operating units concerning spending costs budget related to it and deploying related costs efficient and approved budgets control system
- Reward and punishment schemes for suitable performance or appropriate in implementing approved plans
- Reusing quantitative objectives and different duties of organization and performance evaluation indicators with the participants of all units and offices that are involved in making quantitative objective applied and evaluation indicators in forms that report performance and formulation of strategic plans and consequently, short term and medium term plans and restructure of company consistent with performance-based budgeting.

It is hoped that the results of the research be guide for those who are involved in performance-based budgeting and effective for the future research.

## ACKNOWLEDGEMENT

The researchers would like to thank The National Iranian Gas Company for their support this research appreciated.

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