

# Ranking of indices affecting operational budgeting based on performance information in the country's municipalities using the AHP method

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## Abstract

The current paper aims at structuring the implementation of operational budgeting using performance information to allocate budget resources in the country's municipalities. This is a development-applied, exploratory (causal) and cross-sectional survey. The statistical population of the study in the qualitative stage included university experts specializing in government budgeting and accounting. Experimental municipality elites were also used as experts, and finally, 30 experts were selected. In the quantitative stage of research; 420 employees working in the administrative and financial departments of municipalities were selected. The sample size of 200 people was estimated using the Krejcie -Morgan table. Purposeful and random sampling methods were used in the qualitative and quantitative sections. Experts' opinion determined 8 main indices as the main indices for evaluating operational budgeting in municipalities. These indices are (implementation, organizational performance, efficiency and effectiveness, planning, cost management, organizational change management, reward and accountability management, statistics and information management), each of which consists of several components through coding. The mean expert opinions for the first component, i.e. the method of implementation in the operational budgeting of municipalities, are such that the maximum and the minimum impact from the expert opinions are 9.6 and 5.9, respectively, while most opinions are in the range of 8.1 to 9.2. The opinions are very influential, taking into account the opinions and trapezoidal fuzzy numbers diagrams. Given the significance level of the Friedman test, because the probability value is (0.000) and is less than 0.05, it shows that the variables are significantly different from each other. The results also show that the management component of the reward and accountability system has the maximum rank and the management and statistics management component has the minimum rank. The results of the model evaluation showed that there was a significant difference and effect with respect to the mean and the difference between the means obtained from the comparison of indices and the indices affecting operational budgeting in municipalities. The significance level is less than 0.01 and has been confirmed at the confidence level of 0.99. The magnitude of this effect is (B = 0.72), (B = 0.77), (B = 0.54), (B = 0.87), (B = 0.46), (B = 0.51), (B = 0.49), (B = 0.47)) for Implementation Method, Organizational Performance, Efficiency and Effectiveness, Planning, Cost Management, Organizational Change Management, Reward and Accountability System Management, Statistics and Information Management, respectively.

Keywords: Structuring, Implementation of Operational Budgeting, Performance Information, Allocation of Budget

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## 1 Introduction

Operational budgeting is an annual program in which the relationship between the allocated financial resources and the results of the implementation of each program is shown with quantifiable indices. In operational budgeting, credits are broken down into programs, activities, and designs, plus the volume of operations and the cost of performing each operation according to scientific methods such as cost accounting, workload measurement, and activity-based costing [1]. Operational budgeting increases the ability of decision-makers and managers to evaluate the budget demands of executive bodies by informing decision makers of better information about the results of each program and the set of programs used to achieve common goals [2]. Valid information and performance indices are critical to supporting operational budgeting, and for operational and financial information to be used in better resource allocation decisions, decision-makers must ensure that the indices they provide are appropriate and accurate [12]. In general, the current (programmatic) budgeting system of the municipality has two main types of problems in compiling the relevant instructions and the non-compliance of this instruction with the principles and bases of the program budget. Inadequacy in the economic classification of expenses instead of financial classification, inadequacy in the classification of revenues and sources of financing, inadequacy in the classification of operations, etc., are among the main problems in the municipality. On the other hand, operational budgeting, while determining the expected goals and tools of budget implementation, by determining the relationship between costs and results, explains how to create these relationships and has the greatest impact on basic decisions, and this in itself increases productivity and, consequently, leads to effectiveness [13]. Many studies suggest that operational budgeting has limited its impact on the overall budget and on legal decisions. Because of this, many researchers are debating how to increase operational attention to how operational budgeting can affect decision-making processes in ministries and municipalities. In other words, the current paper addresses the issue of whether it is possible to provide a favorable structure for budgeting for municipalities based on operational budgeting using performance information. Today, due to the lack of a full accrual accounting basis in service organizations, including municipalities, and the weakness in calculating the cost of services due to the impossibility of allocating costs to cost centres, this method cannot be used to establish a proper budgeting system in such organizations [3]. It is practically not feasible and therefore this research firstly seeks to identify the structure of operational budgeting based on performance information in terms of dimensions and components and secondly to design an optimal model for implementing operational budgeting based on performance information based on the identified factors [11].

### 1.1 Research questions

- What structure can be designed to implement operational budgeting using performance information?
- What are the dimensions of the implementation of operational budgeting based on performance information?
- What are the components of each dimension of the operational budgeting structure based on performance information?
- What are the indices of each component of the operational budgeting structure based on performance information?
- What are the dimensions of the components and indices in the structure of operational budgeting based on performance information? (Investigating the relationships between variables)
- How are the dimensions, components and indices of the designed structure to implement operational budgeting based on performance information prioritized?

## 2 Literature review

Hosseini Masoom and Saeedi [6] conducted a study entitled Feasibility Study of Implementing Operational Budgeting Based on the Shah Model at the Islamic Azad University, Bojnourd Branch. The results of the research based on the Shah model, in terms of the test takers in relation to the presence of ability dimension (ability to evaluate

performance, human ability and technical ability) are negative, i.e. there is no necessary ability to implement operational budgeting. According to them, given authority (legal, procedural and organizational authority), there are no appropriate authorities in the Islamic Azad University, Bojnourd Branch. Also, given the acceptance dimension (political acceptance and managerial acceptance and motivational acceptance), there were appropriate conditions. Also, the results show that implementation of operational budgeting is economical to Bojnourd Islamic Azad University.

Alireza Mansourabadi [8], conducted a dissertation entitled Feasibility Study of Implementing Operational Budgeting Based on the "Shah" Model: A Case Study of Shiraz Municipality. The results of the research based on the Shah model are negative in the eyes of the interviewees, given the three dimensions of ability, namely the ability to evaluate performance, human ability and technical ability, and there is no necessary ability to implement operational budgeting. According to them, there are appropriate authorities in Shiraz Municipality, given three dimensions of authority, namely legal, procedural and organizational authority. Also, the results show that the implementation of operational budgeting is economical for Shiraz Municipality. Finally, the comparison of the views of different groups results show that except for the two variables of technical ability and legal authority, there is no significant difference between the views of different groups and categories of employees. There is a relative consensus on the presence or non-presence of the necessary infrastructure to implement operational scheduling, except for the two mentioned variables.

M. Ghazizadeh and M. Ghazizadeh [5] conducted a study entitled "Barriers to non-establishment of operational budgeting system" (Case study of Fatemeh Zahra Hospital) in Sari. According to the results, the priority criteria are structural, environmental and human criteria, respectively; Therefore, it is suggested that in order to reduce the barriers to the establishment of operational budgeting, structural, environmental and human criteria should be considered, respectively. To reduce structural barriers, also the index should be determined in budgeting and changes should be made in the accounting system by designing strategic planning and management information system. To reduce environmental barriers, the government must support operational budgeting and adopt appropriate policies while responding to the people. In order to reduce human barriers, individuals should be trained in this type of budgeting and encouraged to perform properly, and practical actions should be taken based on the proper performance system, the appropriate reward system, and the appropriate punishment system. Finally established a proper reward system and a system of punishment commensurate with improper performance.

R. McNab and F. Melese [9] conducted a study entitled 'Examining Operational Budgeting Prospects in the Federal Government.' The results showed that the parliament should allow resources to be transferred to the next year, audits should be increased and resources should be adequately allocated.

D.P. Moynihan [10] conducted a study entitled "Performance-based budgeting: beyond rhetoric". The results showed that in order to create the operating budget, each program structure must be adjusted more widely, and this requires scrutiny, and the new system must be responsive to budget incentives.

Mandizvidza [7] conducted a study on the use of operational budgeting systems in California municipal agencies. The results showed that the application of operational budgeting, despite its widespread use, has very limited performance, but employees with experience are unlikely to implement operational budgeting, but the use of this system increases efficiency.

### 3 Research method

This is an exploratory (causal) development application and cross-sectional survey. The statistical population of the study in the qualitative stage included university instructors specializing in government budgeting and accounting. Experimental elites were also used in the municipality and were introduced as experts in the research, and finally, 10 experts were selected. In the quantitative stage of research; 420 employees working in the administrative and financial departments of municipalities were selected. The sample size was estimated through the Kerjcy -Morgan table of 200 people. The sampling method was purposive in the qualitative part and simple random in the quantitative section. In the experts' opinion, 8 main indices were evaluated as the main indices for evaluating operational budgeting in municipalities. These indices are (implementation, organizational performance, efficiency and effectiveness, planning, cost management, organizational change management, reward and accountability management, statistics and information management), each of which consists of several components through coding. To implement this proposed model, first, the dimensions and components of the operational budgeting structure were identified based on performance information. Also, using the library method, the dimensions and components of the operational budget implementation structure were collected using the experts' opinions, including university instructors specializing in government budgeting and accounting, and empirical elites in the municipality with the help of semi-structured interviews. Two-stage

Delphi analysis was used to answer the semi-open-ended questions. Also, in order to determine the level of importance of the identified factors, a questionnaire was designed and opinions were ranked using the AHP technique, and finally, the credit distribution model was described based on the weight of each of the identified and ranked effective factors. After identifying the dimensions, components of the model and ranking them, in a quantitative section the structural equation modelling was done to fit the model and also to examine the relationships between variables.

### **Determining the indices, components of the operational budgeting structure using performance information**

#### **Implementation of fuzzy Delphi method in determining the indices of the research model**

The operational steps of the fuzzy Delphi method can be presented as follows.

##### Selection of experts

The experts' opinion is the core of the Delphi method. Therefore, we must first select the experts according to the criteria that come from the heart of the project and are consistent with its objectives. Some of the main features for selection of experts are as follows:

- Be involved with the issue at hand.
- Have ongoing information of the issue to collaborate.
- Be motivated to participate in the Delphi process.
- There is a feeling in them that they benefit from participating in a group, as well.

Given the definition of operating budget structure using performance information, several groups are interested in solving this problem; Therefore, as far as possible, experts should be selected in such a way as to be a good representatives of the stakeholders. Otherwise, the comprehensiveness of the identified indices for modeling stock price changes will be questioned.

According to the mentioned characteristics, finally, 30 experts were selected and the initial preparation for the implementation of the plan was made for them and the full explanations about the polls and the method of consensus were explained to them.

### **3.1 Extract and explain the suggested options**

At this stage, the goal is to determine the extractive indices for stock price changes. According to the research questions as well as the points mentioned in the previous sections, it is necessary to design a questionnaire that consists of eight sections. It is noteworthy that due to the ambiguity in the applied concepts, the questionnaire was designed based on fuzzy variables.

### **3.2 Define language variables**

As mentioned, the questionnaire was designed to obtain the opinion of experts on the relationship between the proposed items and the indices of the operating budget structure using performance information. Therefore, experts should use variables to express these values "to the extent of agreement with the proposed components." Since the proposed questions are very large and their results will be determined in the future and also several factors are involved in their answers, so the use of qualitative variables gives more freedom of action to experts.

The use of qualitative variables such as agree, disagree, and neither agree nor disagree solves the above problems to some extent, but creates another problem. People's mentality toward qualitative variables such as: agree and disagree is not the same. Different characteristics of individuals affect their mental interpretations of qualitative variables; As if some people have a strict attitude and some have an easy attitude; some are optimistic and some are pessimistic. As a result, analysis on variables resulting from different mindsets and interpretations will be worthless. Thus, by defining the range of qualitative variables, experts will answer the questions with the same mindset. Therefore, qualitative variables are defined as trapezoidal fuzzy numbers in the figure below.

In more mathematical terms, the membership the trapezoidal fuzzy number functions can be defined as follows:

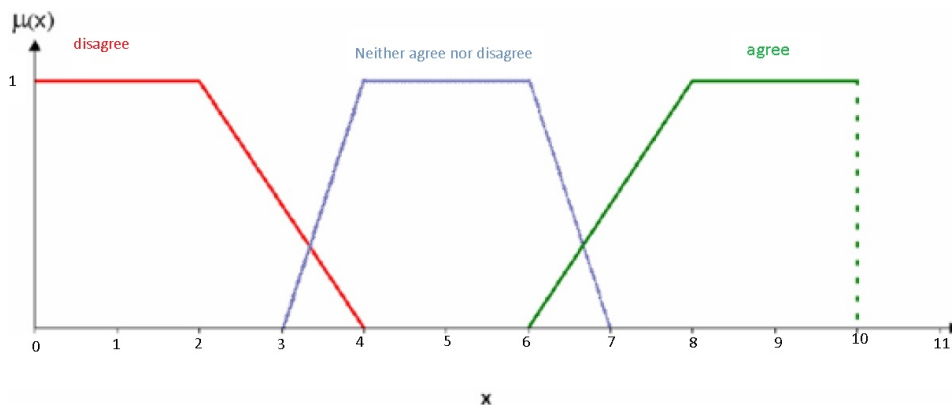


Figure 1: Trapezoidal fuzzy number diagram

$$\mu_{\bar{M}}(X) = \begin{cases} \frac{X-M_1}{M_2-M_1} & St(M_1 \leq X < M_2) \\ 1 & St(M_2 \leq X < M_3) \\ \frac{X-M_4}{M_3-M_4} & St(M_3 \leq X < M_4) \\ 0 & otherpoints \end{cases}$$

$M_i$  are the trapezoidal vertices whose values are determined on the x-axis. For example, in the figure above, the fuzzy form of the language variables is as follows:

In the above figure 1, the disagree language variable is (0,0,2,4), neither agree nor disagree is (3,4,6,7) and agree is (6,8,10,10).

### 3.3 Fuzzy Delphi process

The questionnaire was designed according to the proposed options and language variables defined in the previous section. After distributing and collecting the questionnaires, two new suggestions were received.

The following table shows the results of counting the expert opinions of on each of the components in the first questionnaire:

Table 1: Results of expert opinions

Variable	Index	Expert opinion
Method of operational budgeting implementation in municipalities	Organizational leadership	82-5-1
	Organizational Culture	18-5-11
	Management style	
	Organizational Structure	11-7-8
	Suitable platform for information technology	18-1-1
	Experienced and trained manpower	12-1-1
	Proper accounting system	13-9-3
	Use an appropriate incentive and punishment system in how budgeting is established.	18-2-3
Organizational change management	Execution of partnership contracts with experienced contractors	83-5-1
	Presence of necessary managerial capacities to move to the new system	15-8-7
	High level of management abilities and skills	84-4-1
	Presence of an informed and capable deputy and planning to follow up and implement the issue	14-1-8
	Experiences of shifting from traditional budgeting to program-based budgeting and obtaining additional project information	18-8-1

	Paying attention to effective short-term practical results and paying too much attention to long-term achievements that are mostly intangible	13-5-8	
	Complete and correct knowledge of the category of change in the organization	11-4-1	
	Full commitment of executive departments to full budget execution	84-2-1	
	Slow and gradual movements to change the organization	13-8-1	
Efficiency and effectiveness	Achieving organizational goals in line with defined strategies	83-7-3	
	Reduce costs compared to previous years	13-3-4	
	Proportion between the amount of budget allocated and the costs incurred in the projects	15-6-3	
	Achieving a sustainable motivational system in the organization	14-1-8	
	Determining the criteria for the level of response	18-8-4	
	Proportional change of accounting and reporting system and management information system	16-8-8	
	Increase organizational communication in order to achieve organizational goals	14-1-1	
	Determining the quality of work in line with the amount of costs incurred	18-1-1	
	Optimization of resource consumption in municipalities	18-5-1	
	Manage work time to reduce costs	18-7-1	
	Equip a skilled workforce with expertise in any job skills	12-8-1	
	Optimal distribution of credits between departments	17-1-1	
	Planning	History of planning and goal setting in the municipality and the existence of strategic plans;	15-8-3
		The process of institutionalizing the culture of planning at different levels of the organization;	17-8-1
Existence of a strategic plan as an upstream document;		84-9-8	
Clear link between program objectives and budget lines;		15-5-8	
Formulation of quantitative goals by recognizing executive potentials (unrealistic goal setting);		15-3-1	
Implementation of strategic planning processes;		18-4-1	
Presence of program statistics to evaluate the goals of the program;		18-7-1	
Use of strategic planning models to meet the needs of the people;		14-2-1	
Cost management	Presence of a mechanized accounting system and its relationship with the mechanized system of income, budget, administration	12-5-2	
	Presence of capable employees and managers in order to analyze and implement new methods in the municipality	14-4-9	
	Ability to calculate the cost of units instead of activities with the current system	27-9-1	
	The general familiarity of users with the concepts and methods of cost analysis in the discussion of operational budgeting	17-1-2	
	Calculation of indirect and overhead costs	14-2-3	
	Analysis and review of technical and economic efficiency in the municipality	18-2-1	
	Practice cash accounting, semi-accrual instead of full accrual	14-8-3	
	Priority of senior management in the implementation of operational budgeting	19-5-1	
Statistics and information management	Presence of mechanized databases in different functional areas of the municipality	18-2-1	
	The rate of formation of a statistical information unit and a specific trustee for discussing statistics and preparing municipal statistics	27-8-2	
	The extent of managers' approach to the need for timely statistics and information to make decisions	10-1-2	
	Designing and compiling a comprehensive statistical system	14-1-1	
	Development and learning of information technology in various fields	18-5-2	
	Utilizing the successful experience of other metropolises and the possibility of upgrading the current position	14-7-1	
	Reward and accountability system management	Implementing and establishing the system of suggestions of employees and citizens	13-1-2
Increasing the spirit of accountability and meeting managers with citizens in order to solve people's problems		10-4-1	



Organizational Performance	High financial capacity in the municipality to support effective programs	15-5-3
	Presence of continuous performance reports in the organization	17-2-4
	Change the approach from focusing on inputs to outputs and outcomes	14-7-3
	Make a clear connection between the resources spent and the outputs and outcomes	20-1-1
	Turn budget documents into tools for economic planning and organizational performance management	14-3-1
	Allocate budget credits in exchange for better services instead of spending more resources	15-4-1
	Increase the motivation of managers and employees to provide services with lower costs and higher quantity and quality	17-1-2
	Adapting the powers and responsibilities of managers	11-2-3
	Standardize services by identifying superior ways of providing services and promoting and generalizing them	19-1-1
	Prioritize projects in accordance with the budget structure	12-3-1
	Replacement of up-to-date equipment to reduce costs	24-8-2
	Training of skilled manpower to implement projects	14-1-2
	Reduce administrative bureaucracy to carry out projects quickly	10-2-1

### 3.3.1 Mean value of indices

the results of questionnaires collected from 30 experts who participated in the research, the mean value per index is calculated according to the following relation:

$$A_i = (a_1, a_2, a_3, a_4, a_5) \quad i = 1, 2, \dots, n$$

$$A_m = (a_{m1}, a_{m2}, a_{m3}, a_{m4}, a_{m5}) = \left( \frac{1}{n} \sum a_1^i, \frac{1}{n} \sum a_2^i, \frac{1}{n} \sum a_3^i, \frac{1}{n} \sum a_4^i, \frac{1}{n} \sum a_5^i \right)$$

where,  $A_i$  represents the  $i$ 's expert opinion and  $A_m$  expresses the mean expert opinion. The mean value per index is given in Table 2.

Table 2: Mean value of expert opinion

Variable	Index	Expert opinion
Method of operational budgeting implementation in municipalities	Organizational leadership	[5.9, 8.1, 9.2, 9.6]
	Organizational Culture	[4.8, 5.6, 7.2, 8.9]
	Management style	[5.3, 6.4, 7.2, 8.7]
	Organizational Structure	[2.4, 2.1, 6.4, 6.3]
	Suitable platform for information technology	[3.7, 4.7, 5.4, 6.3]
	Experienced and trained manpower	[4.8, 4.4, 7.7, 7.6]
	Proper accounting system	[5.1, 5.4, 8.7, 8.7]
	Use an appropriate incentive and punishment system in how budgeting is established.	[4.3, 5.7, 6.4, 7.9]
	Execution of partnership contracts with experienced contractors	[5.8, 7.2, 7.1, 7.7]
Organizational change management	Presence of necessary managerial capacities to move to the new system	[4.9, 5.1, 7.2, 7.6]
	High level of management abilities and skills	[3.8, 4.6, 6.2, 6.9]
	Presence of an informed and capable deputy and planning to follow up and implement the issue	[5.3, 4.4, 7.2, 7.3]
	Experiences of shifting from traditional budgeting to program-based budgeting and obtaining additional project information	[6.9, 5.1, 8.6, 8.3]
	Paying attention to effective short-term practical results and paying too much attention to long-term achievements that are mostly intangible	[2.3, 3.7, 5.4, 5.3]

	Complete and correct knowledge of the category of change in the organization	[3.8, 1.8, 5.7, 5.9]	
	Full commitment of executive departments to full budget execution	[6.5, 7.6, 9.7, 9.8]	
	Slow and gradual movements to change the organization	[4.3, 5.7, 6.4, 6.3]	
Efficiency and effectiveness	Achieving organizational goals in line with defined strategies	[6.8, 5.2, 9.1, 9.7]	
	Reduce costs compared to previous years	[3.1, 3.3, 7.7, 7.3]	
	Proportion between the amount of budget allocated and the costs incurred in the projects	[4.2, 4.4, 8.2, 8.4]	
	Achieving a sustainable motivational system in the organization	[4.9, 4.1, 8.2, 8.6]	
	Determining the criteria for the level of response	[2.8, 2.6, 5.5, 5.9]	
	Proportional change of accounting and reporting system and management information system	[5.3, 5.4, 8.2, 8.6]	
	Increase organizational communication in order to achieve organizational goals	[3.9, 3.1, 6.4, 6.3]	
	Determining the quality of work in line with the amount of costs incurred	[3.7, 3.7, 5.4, 5.3]	
	Optimization of resource consumption in municipalities	[2.6, 2.4, 4.7, 4.7]	
	Manage work time to reduce costs	[4.1, 4.4, 8.7, 8.7]	
	Equip a skilled workforce with expertise in any job skills	[4.3, 4.7, 6.4, 6.9]	
	Optimal distribution of credits between departments	[2.8, 2.2, 7.1, 7.7]	
	Planning	History of planning and goal setting in the municipality and the existence of strategic plans;	[4.1, 4.3, 7.2, 7.3]
		The process of institutionalizing the culture of planning at different levels of the organization;	[2.2, 2.4, 6.8, 6.4]
Existence of a strategic plan as an upstream document;		[6.9, 6.1, 9.2, 9.6]	
Clear link between program objectives and budget lines;		[2.8, 2.6, 6.2, 6.9]	
Formulation of quantitative goals by recognizing executive potentials (unrealistic goal setting);		[4.3, 4.4, 8.2, 8.3]	
Implementation of strategic planning processes;		[2.9, 2.1, 6.4, 6.3]	
Presence of program statistics to evaluate the goals of the program;		[3.7, 4.7, 7.4, 7.3]	
Use of strategic planning models to meet the needs of the people;		[3.2, 3.4, 5.7, 5.6]	
Cost management	Presence of a mechanized accounting system and its relationship with the mechanized system of income, budget, administration	[2.1, 2.4, 6.7, 6.7]	
	Presence of capable employees and managers in order to analyze and implement new methods in the municipality	[2.3, 2.7, 5.4, 5.9]	
	Ability to calculate the cost of units instead of activities with the current system	[6.4, 6.2, 9.1, 9.6]	
	The general familiarity of users with the concepts and methods of cost analysis in the discussion of operational budgeting	[3.1, 3.3, 6.7, 6.3]	
	Calculation of indirect and overhead costs	[5.2, 6.4, 8.8, 8.4]	
	Analysis and review of technical and economic efficiency in the municipality	[5.9, 5.1, 8.2, 8.6]	
	Practice cash accounting, semi-accrual instead of full accrual	[4.8, 5.6, 6.2, 6.9]	
	Priority of senior management in the implementation of operational budgeting	[5.3, 5.4, 8.2, 8.7]	
Statistics and information management	Presence of mechanized databases in different functional areas of the municipality	[5.9, 5.1, 7.4, 7.3]	
	The rate of formation of a statistical information unit and a specific trustee for discussing statistics and preparing municipal statistics	[7.2, 6.7, 9.4, 9.3]	
	The extent of managers' approach to the need for timely statistics and information to make decisions	[1.8, 1.4, 5.7, 5.6]	
	Designing and compiling a comprehensive statistical system	[5.1, 5.4, 8.1, 8.7]	
	Development and learning of information technology in various fields	[4.3, 4.7, 6.4, 6.9]	
	Utilizing the successful experience of other metropolises and the possibility of upgrading the current position	[5.8, 5.2, 6.1, 6.7]	



Reward and accountability system management	Implementing and establishing the system of suggestions of employees and citizens	[3.1, 3.3, 5.7, 5.3]
	Increasing the spirit of accountability and meeting managers with citizens in order to solve people's problems	[5.2, 6.4, 7.8, 8.4]
	High financial capacity in the municipality to support effective programs	[4.9, 4.1, 7.2, 7.6]
	Presence of continuous performance reports in the organization	[1.8, 1.6, 3.2, 3.9]
Organizational Performance	Change the approach from focusing on inputs to outputs and outcomes	[5.3, 6.4, 7.2, 8.7]
	Make a clear connection between the resources spent and the outputs and outcomes	[5.9, 5.1, 6.4, 6.3]
	Turn budget documents into tools for economic planning and organizational performance management	[3.7, 3.7, 6.4, 6.3]
	Allocate budget credits in exchange for better services instead of spending more resources	[2.8, 1.4, 4.7, 4.6]
	Increase the motivation of managers and employees to provide services with lower costs and higher quantity and quality	[4.1, 4.4, 6.7, 6.7]
	Adapting the powers and responsibilities of managers	[4.3, 5.7, 6.4, 7.9]
	Standardize services by identifying superior ways of providing services and promoting and generalizing them	[5.8, 7.2, 8.1, 8.7]
	Prioritize projects in accordance with the budget structure	[4.1, 4.3, 6.7, 6.3]
	Replacement of up-to-date equipment to reduce costs	[6.2, 6.4, 9.6, 9.7]
	Training of skilled manpower to implement projects	[3.1, 3.2, 6.1, 6.3]
Reduce administrative bureaucracy to carry out projects quickly	[1.2, 1.4, 4.6, 4.7]	

The mean expert opinions for the first component, i.e. the method of implementation in the operational budgeting of municipalities, is such that the maximum impact from the expert opinions is 9.6 and the minimum is 5.9, while most opinions are in the range of 8.1 to 9.2. According to the opinions and diagrams of the trapezoidal fuzzy numbers that have been passed, it can be said that the opinions are very influential. The same interpretation applies to other indices values.

### 3.4 Prioritization of components

To rank the variables, Friedman nonparametric test is used as follows:

Variable	Rank
Organizational Performance	3.99
planning	4.01
Execution method	4.84
Efficiency and effectiveness	3.93
Statistics and information management	3.86
Reward and accountability system management	5.11
Organizational change management	4.83
Cost management	5.42
Chi-Square	61.3
Asymp. Sig.	0.000

The significance level by Friedman test shows a significant difference among variables, because the probability value is (0.000) and is less than 0.05, it. The results of the table above also show that the management component of the reward and accountability system has the maximum rank and the component of statistics and information management has the minimum rank.

### 3.5 Cronbach's composite and alpha reliability

Measurement models or structures are classified into two categories of reflective structures and composite structures. Usually the reliability of internal consistency is the first criterion accounted for in reflective measurement models. The traditional measure for controlling it is Cronbach's alpha, which calculates the estimate for reliability based on the

internal correlation of the reagents. If Cronbach's alpha is greater than 0.70, the internal consistency and one-dimensionality of the block are confirmed. In addition to Cronbach's alpha, PLS path models use composite or hybrid reliability to evaluate the reliability of internal consistency. If the value of this index, known as Dillon–Goldstein is more than 0.70, the composite or hybrid reliability of the model is also confirmed.

Composite reliability is a better indicator than Cronbach's alpha for recognizing that a block is one-dimensional. Because Cronbach's alpha is based on the assumption of equivalence of the observed variables. But composite reliability does not assume this and is based on the results of the model (i.e. factor loads) to the correlation between the variables observed in the data set, in fact, Cronbach's alpha provides a lower limit estimate of reliability. Table 4 shows the results and output report of PLS software for this composite reliability index.

Table 4: Cronbach's alpha and composite reliability table

<b>Cronbach's alpha</b>	<b>composite reliability</b>	<b>Variable</b>
0.942039	0.950082	Organizational Performance
0.883491	0.911898	planning
0.914077	0.931588	Execution method
0.894767	0.916732	Efficiency and effectiveness
0.863140	0.893283	Statistics and information management
0.859099	0.891478	Reward and accountability system management
0.714696	0.823404	Organizational change management
0.906126	0.921601	Cost management

As you can see, the values obtained for Cronbach's alpha and composite reliability are all greater than 0.70, which indicates the optimal reliability of the research variables. Therefore, the measurement model has good reliability.

The positive the Goodness Of Fit index (GOF), which is 0.617, indicates the overall fit of the model. Because this value is greater than 0.35, it turns out that it has a good value. As a result, the overall fit of the model is confirmed.

Table 5: Relative coefficients of indices affecting operational budgeting based on performance information in municipalities

<b>Rank</b>	<b>Index</b>	<b>Relative coefficients</b>
1	Organizational Performance	4.48
2	planning	4.45
3	Execution method	4.33
4	Efficiency and effectiveness	4.08
5	Statistics and information management	3.23
6	Reward and accountability system management	4.78
7	Organizational change management	3.65
8	Cost management	3.35

## 4 Structural Equation Modeling

### 4.1 Evaluation of research model validity

The first to confirm the validity of measurement models is to test convergent validity. Convergent validity means that the set of references explains the main structure. Fornell and Larcker [4] suggested the use of the Average Variance Extracted (AVE) as a measure of convergent validity. A minimum AVE of 0.5 indicates sufficient convergence validity, meaning that a latent variable can explain on average more than half of the scatter of its representations.

According to the table 6, the AVE value is higher than 0.5 for all variables. Therefore, it can be said that convergent validity of measurement models is desirable.

### 4.2 Model fit

The overall fit index of the GOF model is calculated as the geometric mean  $R^2$  and the mean communality.

$$GOF = \sqrt{\text{Communality} \times \overline{R^2}}$$

Table 6:

Factor	AVE
Organizational Performance	0.615493
planning	0.634033
Execution method	0.609147
Efficiency and effectiveness	0.583028
Statistics and information management	0.512276
Reward and accountability system management	0.512347
Organizational change management	0.540219
Cost management	0.519677

In this formula, the explained variance index  $R^2$  and the quality of the *Communality* measurement model are as follows: It should be noted that the explained variance index for the endogenous structures of the model is examined and shows how much the dependent variable could predict or explain the dependent variable.

Table 7: GOF validity index

Selective index	$R^2$	COMMUNALITY	GOF	Result
Organizational Performance	0.757688	0.613254	0.617	Confirmed model
planning	0.705411	0.615493		
Execution method	0.757807	0.634033		
Efficiency and effectiveness	0.796320	0.609147		
Statistics and information management	0.375257	0.583028		
Reward and accountability system management	0.826904	0.512276		
Organizational change management	0.676804	0.512347		
Cost management	0.629475	0.540219		
<b>Mean</b>	<b>0.68</b>	<b>0.56</b>		

Table 8: Significant differences in the indices affecting operational budgeting based on performance information in municipalities

Indices	(B)	(CR)	t	Degrees of freedom	Mean	Means difference	Sig
Organizational change management	0.51	2.62	3.6	200	3.12	0.39	0.000
Cost management	0.46	2.82	3.9	200	3.25	0.46	0.000
Organizational Performance	0.77	2.68	4.2	200	3.45	0.67	0.000
planning	0.87	2.54	4.1	200	4.35	0.86	0.000
Execution method	0.72	2.79	5.2	200	4.36	0.83	0.000
Efficiency and effectiveness	0.54	2.52	6.2	200	3.12	0.72	0.000
Reward and accountability system management	0.49	2.42	6.35	200	3.31	0.67	0.000
Statistics and information management	0.47	2.35	6.42	200	3.22	0.62	0.000

Table 8 shows that there is a significant difference and effect with respect to the mean and the means difference obtained from the comparison of indices; there are indices affecting operational budgeting in municipalities, so it is confirmed at the confidence level of 0.99, given that the critical ratio is out of range (1.96 and -1.96) and the significance level is less than 0.01.

### 5 Conclusion

Today, operational budgeting is the allocation of resources to achieve the planned goals and objectives, as well as the achievement of performance and effectiveness indices. Therefore, the use of an operational budgeting system in the country's municipalities will lead to improvements in planning, control and resource management systems to achieve goals and policies. Acceptance of the operational budgeting system in which there is a clear and understandable relationship between the credits intended in the budget and the performance of the municipalities is of special importance

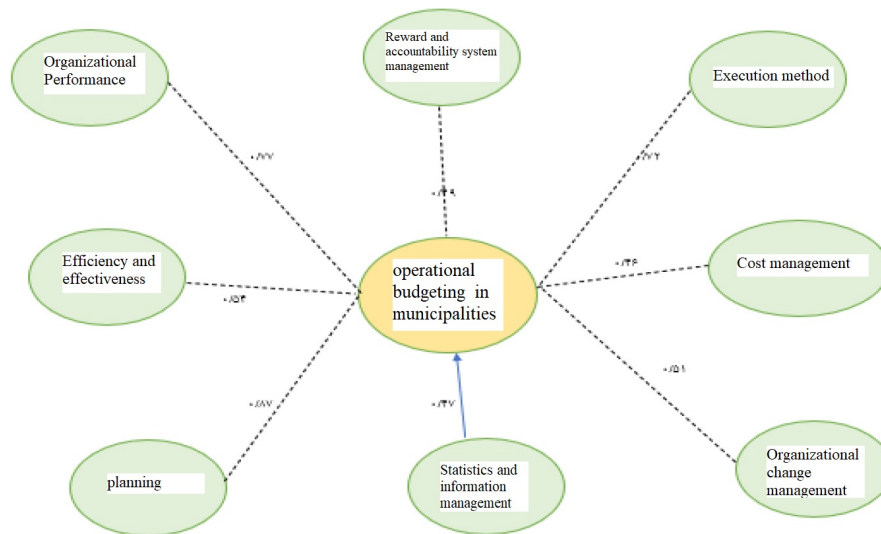


Figure 2: Structural model of indices affecting operational budgeting based on information in municipalities

and it is believed that the implementation of the operational budgeting system in the municipalities of the country may significantly affect their performance by reducing costs and increasing the quality of operations. Given the importance of operational budgeting, the operational budgeting system in the country's municipalities has not been very successful in practice, and several factors have led to the lack of operational budgeting. The current paper shows that organizational, executive, and functional factors have played a great role in this field and are considered as factors that prevent proper operational budgeting to allocate resources. The results show that establishing an operational budgeting system is a necessity. The research results show that the indices of implementation, organizational performance, planning, cost management, efficiency and effectiveness and... should be addressed. Accountability of the country's municipalities to the people and society, which is considered as one of the goals of operational budgeting can facilitate the implementation of operational budgeting to allocate resources, on the other hand, having operational audits in the country's municipalities, government support for operational budgeting by creating legal requirements, coordination between MPs and municipalities, adopting a transparent policy in operational budgeting in all municipalities, as well as agreement and coordination at various levels of the executive branch with the legislature are influential factors. It becomes. Achieving such goals requires further simplification of legal procedures and the removal of cumbersome financial regulations.

In addition to the above, for the successful implementation of operational budgeting, there must be proper planning for operational budgeting. Without strategic planning, without a doubt, the implementation of operational budgeting will not be possible, furthermore, the presence of information management in operational budgeting is essential. It also seems important that in order to move from the traditional budgeting system to the operational budgeting system, managers need financial reports in different parts of municipalities, which will be possible only in the form of management information systems. Organizational changes to implement operational budgeting, accounting system to implement operational budgeting, operational budgeting training, the presence of a reward and accountability system management to implement operational budgeting and providing a suitable index to achieve the goals can provide good conditions for implementing operational budgeting. There are other important prerequisites, including the presence of organizational systems analysis system, staff experience to implement operational budgeting, the presence of a measurement index in operational budgeting, providing an operational budgeting reporting system, turning away from traditional budgeting methods, having a strategic plan in operational budgeting can be effective in establishing operational budgeting. In this study, various indices were determined by experts to evaluate operational budgeting based on information in municipalities. These indices are: (implementation method, organizational performance, efficiency and effectiveness, planning, cost management, organizational change management, reward and accountability management, statistics and information management), each of which consisted of several components through coding. The hierarchical value of each of them was determined through The Analytic Hierarchy Process (AHP). Strengths, weaknesses, threats and opportunities of the extracted items were determined for each index. The results of the relationship between indices and operational budgeting were 99% significant.

Finally, the evaluated indices were plotted as a model. The results of the model evaluation showed that there was

a significant difference and effect with respect to the mean and the difference between the means obtained from the comparison of indices affecting operational budgeting in municipalities. The significance level is less than 0.01 and has been confirmed at the confidence level of 0.99. The magnitude of this effect is (B=0.72), (B=0.77), (B=0.54), (B=0.87), (B=0.46), (B= 0.51), (B=0.49), (B=0.47) for Implementation Method, Organizational Performance, Efficiency and Effectiveness, Planning, Cost Management, Organizational Change Management, Reward and Accountability System Management, Statistics and Information Management, respectively.

## 6 Suggestions

1. Resource allocation should be appropriately distributed among different parts of municipalities. If it is not distributed properly, there will be inconsistencies between the different sections. And this makes the municipalities inefficient and undermines their performance. Therefore, it is suggested that the necessary resources be properly distributed in different sectors.
2. Give the main opportunities including the major priority of the government is in the field of operational budgeting and there are positive changes in the governing environment and the private sector has grown in the implementation of municipal duties and given the strengths of the institutionalized designing and extracting appropriate performance indicators, the presence of a mechanized accounting system and the planning culture in various levels of the municipality organization, it is suggested to take action to implement operational budgeting in Municipalities with government and the private sector support.
3. Given the main threats of the ambiguity and uncertainty of processes, lack of urban management system and the number of decision centres and rapid changes occur in the field of information technology and the strengths of the municipality to design and extract appropriate performance indices, the presence of institutionalized mechanized accounting system and its relationship with mechanized systems and planning culture at different levels, it is suggested to control ambiguous effects of processes using appropriate performance indicators, control rapid changes in the field of information technology using a mechanized accounting system and control rapid changes in the field of information technology and control the absence of integrated municipal management system and a number of decision centers with a culture of planning at different levels of the organization.
4. Give the main opportunities including the major priority of the government is in the field of operational budgeting and there are positive changes in the governing environment and the private sector has grown in the implementation of municipal duties and given the municipal weaknesses include the absence of a link between revenues from the sale of services of the organization with the current costs of providing services, levels of indices and its relationship with unspecified goals and weakness in converting quality indices to quantitative, it is suggested that all sales of services and municipal costs be controlled to act upon the relationship between indices and goals and conversion of quality indices into quantitative ones for better management with the help of the private sector and with the support of the government in order to better implement operational budgeting.
5. Given the municipal weaknesses include the absence of a link between revenues from the sale of services of the organization with the current costs of providing services, levels of indices and their relationship with unspecified goals and weakness in converting quality indices to quantitative, and threats include the ambiguity and uncertainty of the effects of the processes, absence of urban integrated management system and the number of decision-making centers and rapid changes in the field of information technology and obsolescence of current mechanized systems, therefore, it is suggested the current providing services revenues be spent on converting quality indices to quantitative, to manage the indices and obtain the relationship between the indices and the goals with the processes are precisely defined, the integrated management system is formed and the systems be updated with rapid changes with information technology to be able to manage existing threats.
6. Municipalities of the country are obliged to explain the legal requirements and procedures necessary for the establishment of operational budgeting by themselves. Thus, the design and provision of training courses for staff in areas related to the budget is very necessary.
7. In order to successfully implement operational budgeting or facilitate its establishment, the grounds for creating a comprehensive management information system in the country's municipalities should be formed and coordinated with operational budgeting.
8. The municipalities of the country should provide the ground for the implementation of operational budgeting by employing qualified and specialized people in the field of budgeting, as well as creating a competency system and establishing an appropriate salary system.
9. Designing a new accounting system and different procedures for calculating the cost of activities and products are among the basic needs for establishing operational budgeting, therefore, establishing a cost system and changing the accounting system of municipalities for development. The application of accounting is essential in the operation of municipal budgets.

10. Comprehensive educational program such as courses and workshops in order to increase the awareness and knowledge of all stakeholders at the organization level and subjects related to the budget in the municipalities.

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