

Feasibility Study and Measuring Some Effects of the Activity Based Management (ABM) in the Iran Railway

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Abstract

The research is to develop cost methodology to support railway managers for identifying principles, tools and methods of activity based management correctly and precisely, and can be useful and effective for managers for realizing their goals. The research result a ministry can be suitable guideline in terms of how to execute activity based management. Since in this research, main and secondary activities are studied completely in the Railway organization, it can be an explanatory research. The research population is headquarter managers and experts of railway organization and the sampling procedure is goal –oriented and judgmental. 74 people were selected by using a formula. All hypotheses were tested in 95% significance level. Meanwhile a proposed process of applying .activity based management was offered.

Keywords : Direct and indirect costs, Activity center, Activity stimulant, Final cost

1. Introduction

Managers must not consider the activity based management as an accounting process. In fact they must regard it as a strategic tool providing them with some information and feedbacks which helps them to achieve their goals and plans in a competitive environment.

The cost management in its expanded definition includes all related activities and infrastructures that an enterprise uses to target and measure the rate of reaching its goals and objectives. The cost management develops a vital coordination between the enterprise strategy and the evaluation process. It attempts to determine the effective activities of the enterprise which are to be allocated for the successful execution of its strategies. They include the measurement of the organization total cost and how each organizational unit is related to the organization total cost. The organizations are required to coordinate the goals with

their general strategies. It happens when the individuals and working groups have a comprehensive understanding of the cost process and framework as a part of their work culture.

2. Research Theoretical Bases

2.1 Concept of ABM

The activity based management puts emphasis on managing the activities and processes in order to enhance value added and increase the profits and customer satisfaction. The ABM tries to combine the cost stimulants, analysis of activities and processes, measurement of performance, efficiency and effectiveness within an integrated framework used for decision making.

2.2 Application of ABM

The organizations believe that the ABM approach can support them to make better decisions, enhance and improve their performance and obtain more profits out of their assets. The ABM is a powerful tool to effectively understand the efficacy of the produced services and products in a configured organization for utilizing them in a decision making process. ABM also provides complete information on the total value chain strategic and tactics. ABM has a lot of tactical and strategic applications too.

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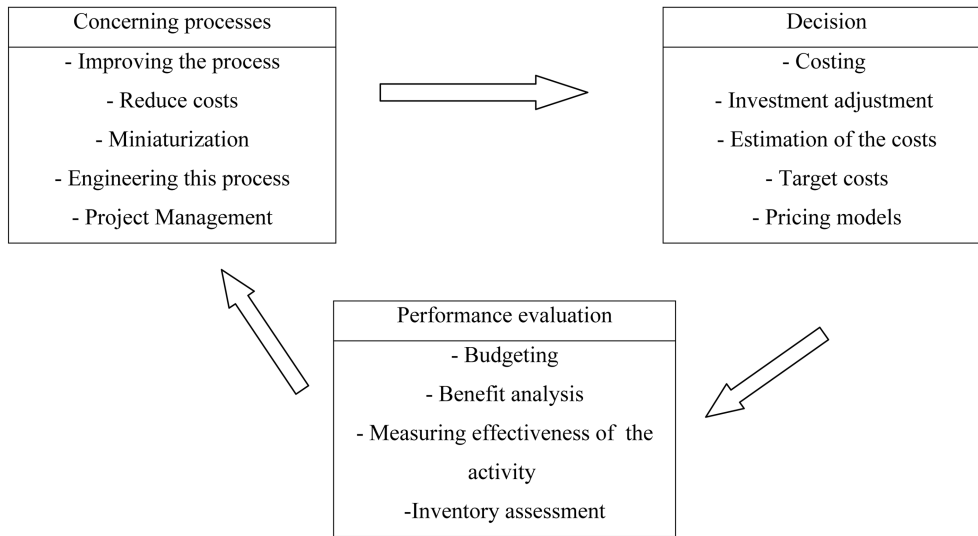


Fig. 1 Value cycle of the ABM

2.3 Cycle of the ABM Value and Benefits of ABM

Activity Based Management can be only measured through the decisions, actions and obtained information. Only the information obtained through the optimal use of ABM is to be very useful, otherwise it would be regarded as a waste of resources. Benefits and values of a management based system can be demonstrated in a three phase cycle under the title of management based value cycle system (Miller, 1996).

2.4 Executive Method of ABM

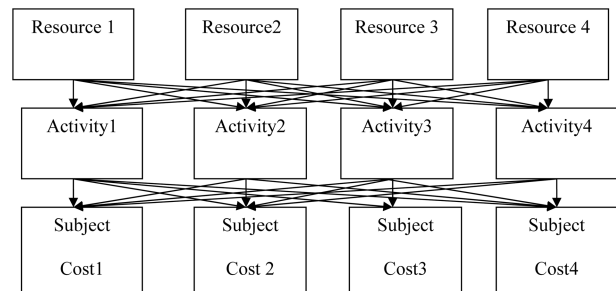
In an Activity Based Management (ABM) organization; information is collected for a specified period and for the entire organization. This means that the activities and business processes at the level of the organization are defined and specified. Some procedures have been developed to collect such data and information, product or service cost and activity information in a format and a time to take decision, to track and measure performance and useful operational information, to provide final documentation for the Activity Based Management Information System (ABMIS).

3. ABM Executive Steps

First step : Provide General Assessment and Overall ABM Framework

The ABM model is firstly drawn on a paper as a conceptual model.

The conceptual model must show correlation among costs, activities and destinations.



Second step : Use block diagram to divide different units of the organization

First, divide the organization into some manageable sections and then assign the following four items to each section:

3.1 Precise Planning with Necessary Details

Detailed planning includes defining of the mission, goal and expectations of each unit of the independent organization. The important section of ABM consists of preparation of the project detailed plan, time schedule, responsibilities assigned, definition of required resources and selection of staff to perform work and collect data. Moreover, the methods of data gathering must also be documented.

3.2 Activities Analysis

Activity analysis is the main part of the ABM. The process includes determination of activities and processes, definition and identification of cost stimulants, documentation, input and output criteria, activities analysis from the view of value added as well as development of the performance criteria.

3.3 Cost Estimation of an Activity or Product

ABC system is an important product or activity costing system.

ABC system is implemented in two main stages. The first stage includes full cost estimation of activities followed by the second stage which fully estimates the prices of the cost issues.

First stage

1. Identification of all performed activities in the organization.
2. Identification of all consumed resources in the organization
3. Identification of resources stimulant
4. Full cost estimation of activities through the allocation of resources to the activities made by the costs stimulant.

Second stage : Identification of goals and cost subjects

1. Identification of cost subjects
2. Identification of activities stimulant such as the number of personnel for allocation of prices to the cost subjects.
3. Full cost estimation of the cost subjects through the activity cost allocation based on the activity stimulant.

4. Results Documentation

Result documentation is the final step of the activity based management including documentation of the fully accomplished works, the results obtained, suggestions and conclusions. In spite of the high importance of the documentation process it is often neglected. For more achievements it is better to correct and improve the organizational activities based on the obtained knowledge.

4.1 Thirst Step : Prepare an Effective System of Data Collection and Report

These useful reports are powerful tools of communication which must be comprehensible, subject oriented, correct, precise and up-to-date. Specifically the report must be prepared based on its application.

4.2 Research Hypotheses

1. Using the ABM leads to the improved quality of work process of the activities.
2. Using the ABM results in the cost reduction of the work process.
3. ABM results in the reduction of number of manpower.

4.3 The Statistical Population and Sample

The present statistical study population consists of the Iranian railway managers and experts of the central district. Sampling method used in this research, is goal-oriented and judgment based. The following formula is used to determine the statistical sample size. The obtained number is 74.

$$n = \frac{Z^2 \cdot p \cdot q}{\epsilon^2}$$

In this study, using the SPSS software, the Chronbach's alpha questioner was roughly estimated to 86%.

4.4 Data Analysis Method

The most important part of this research is the analysis of the collected data. Because of the volume of information gathered on the area of technology, people and processes there may be some irrelevant data too. So before any analysis performed it is necessary to extract the unnecessary information. In order to analyze the gathered information a combined method is used which includes methodology of the work study.

Improvement of systems and methods (job allocation table technique and workflow diagrams), industrial accounting along with the SPSS software. The questionnaire is used to collect data consisting of two parts, including general and specific questions. The general questions included demographic variables such as age, educational degree, work experience in organization and background of current job. However, there were 46 specific questions based on the goals and subjects of the research studying the possibility of ABM implementation and its related hypotheses. The scale used in these questions is the 5 choice Likert Scale questions.

4.5 Study of Demographic Variables

Majority of the respondents were between 31 to 40 years old, of whom 77 percent with 40 years of age. Majority of respondents have bachelor degree while 14.85% in higher degrees. Most of the respondents have work experience of 6 to 15 years with 75.7 percent with 15 years of experience in the organization. Most of the respondents have between 1 to 5 years of experience in their current job and 90.5% have been working in their current job for more than 10 years.

5. Results

The questionnaire is designed based on 5 choice Lykrt scale. In order to extract the required information from the questionnaire and hypothesis test, each option is ranked in

Hypothesis 1 Using the ABM Leads to the Improved Quality of Work Process of the Activities

Variable name	Average of answers in sample	Range of average answers in the community	Degree of freedom	"t" value obtained from the sample	"t" value at 5% error level	Intensity of the relation
quality improvement	3.9189	<m<3.9613 3.9189	73	43.245	1.96	Strong

Result: As shown in the table above, the average responses in the sample (3.9189) is higher than 3. So at 95% confidence level the default of H1 is accepted. Therefore, at 95% confidence level and (accepting 5% of error) it can be claimed that:

Applying ABM leads to the improved quality and efficiency of work activities process.

Meanwhile, the range of average responses in population is Located between $3.8766 < m < 3.9189$. So the relation intensity between two variables using ABM and quality work activities process is "strong".

Hypothesis 2 Using the ABM Results in the Cost Reduction of the Work Process

Variable name	Average of response s in sample	Range of average responses in population	Degree of freedom	T value obtained from the sample	T value at 5% error level	Intensity relation
Costs reduction	3.8750	<m<3.9202 3.8298	73	38.563	1.96	Strong

Result: As shown in the table above, the average responses in the sample (3.9189) is higher than 3. So at 95% confidence level the default of H1 is accepted. Therefore, at 95% confidence level (accepting 5% of error) it can be claimed that:

Applying ABM leads to the improved quality and efficiency of work activities process.

Meanwhile, the range of average responses in population is Located between $3.8298 < m < 3.9202$. So the relation intensity between two variables using ABM and cost reduction of work cycle process is "strong".

Hypothesis 2 ABM Results in the Reduction of Number of Manpower

Variable name	Average of response s in sample	Range of average responses in population	Degree of freedom	T value obtained from the sample	T value at 5% error level	Intensity relation
Human force reduction	3/9426	<m<3/9840 3/9012	73	45/346	1/96	Strong

Result: As shown in the table above, since the average responses in the sample (3/9426) is higher than 3. So at 95% confidence level the default of H1 is accepted. Therefore, at 95% confidence level (accepting 5% of error) it can be claimed that:

Applying ABM based on the activity leads to the reduction in number of man power.

such a way that the option "very low" is equal to 1, option "low" equal to 2, "middle" 3, "high" 4, and "very high" is 5.

Accordingly, if the average score of answers in the sample was located between 4 to 5, 4 to 3, 3 to 2.5 and 2 to 1 the intensity relation between those two variables would respectively be analyzed as very strong, strong, relatively poor, and very poor.

6. Conclusion

There are some important subjects concerning the ABM. First, the executive railway managers must expand and encourage the ABM approach at all levels of the organization as a fundamental organizational culture. Second, they must also encourage some of the key concepts within the framework of activity based cost management at an appropriate level of their organization. Eventually, the systems and processes must be flexible enough to be able to support the required information needed to meet changes in strategies, competition and markets.

According to the investigations it became clear that in this population there is no specific system to calculate the final cost. So this causes the organizational management to face some problems in the process of decision making. Thus, the lack of specific system of final cost calculation would lead to the lack of effective control on the cost and evaluation of the staff performance. In present condition it is very hard to forecast the volume of activities and plans. According to this study the current cost system is as following:

1. It lacks the final cost estimation system.
2. The existing system is not reliable enough to adequately support the operational needs.
3. The existing system can not prepare the management reports. In another word the system in respect to the organization performance is not capable enough to support activities, processes, services and customers.
4. The existing system has no information on the final cost, life cycle, and depreciation allowances of the accumulated assets.

5. There is no appropriate classification of cost allocation to the variety of services provided.

6. There is no appropriate classification for the identification of cost resources.

7. This system is a past oriented approach whose information more relies on the past events.

8. The cost estimation system is unable to understand the scope of performed activities resulted in costs.

7. Suggestions

However, concerning the mentioned above defects as well as removing its shortcomings this research attempts to demonstrate the ABM method as simply as possible showing the cycle process. However the system implementation has some requirements to be fulfilled. However, there are some recommendations for the successful implementation of this system as following:

1) Along with the preparation of ABM implementation software and networking of the organization, the system capabilities can be used alongside the governmental accounting.

2) With methods improvement and utilization of information technology in the organization the redundant activities are eliminated while increasing the effectiveness the costs are reduced.

3) There is no appropriate trained personnel to work in the financial department. Concerning the training of the financial staff some measures must be done.

4) The work cycle and all information forms should be reviewed for the system implementation.

5) Other systems dealt with the financial system such as salary and wage department must accordingly be modified. More over ABM can do the following effort:

- ABM is a powerful tool to understand the effectiveness of the products and services. It also provides complete information on the whole value chain, at strategic and tactical level. It also has a lot of strategic applications as following:

- It determines the value of all activities, units and etc through a comprehensive understanding of costs and their close interrelation within the railway organization emphasizing on the final result.

- It differentiates all services rendered to different customer.

- It identifies the increasing operating costs of the railway to support the organization growth.

- It provides information for the effective use of railway resources.

- It identifies the opportunities for the cost management.

- It provides information for the improvement of the process efficiency.

- It provides a powerful infrastructure to support the planning process.

- Inform more the management to better apply domestic resources.

- It helps the managers to better identify who is eligible for using the resources and how they are to be utilized.

- It helps the managers to identify the necessary resources for activities.

- It provides a logic and justifiable principle to compare the performance index.

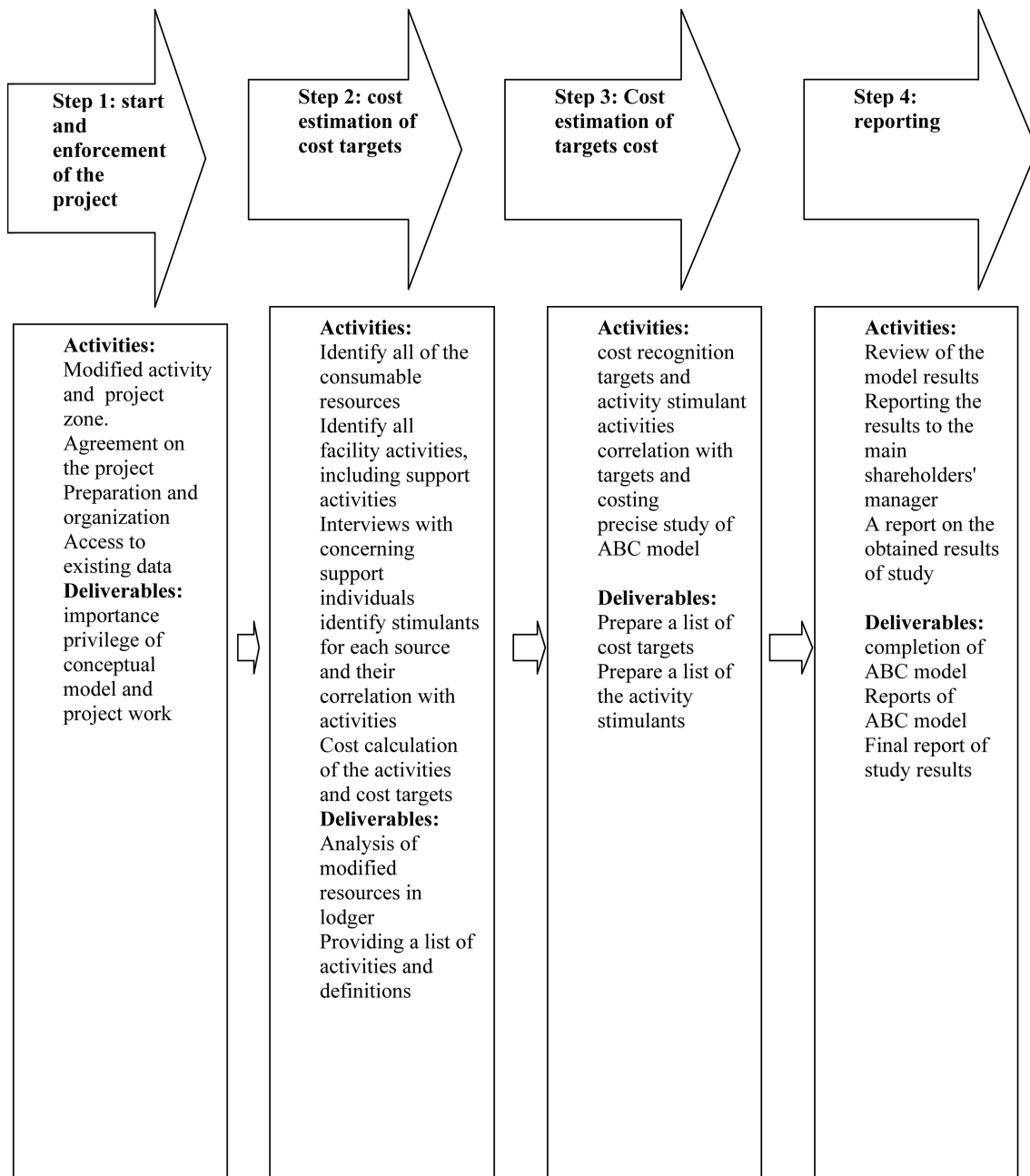
- It clarifies the inefficiencies and faults related to the railway cost information on how much it has cost for a specific cost issue. Moreover, it determines the need for the further refining of the gathering data protocols.

- It enhances the knowledge of railway managers on problems and difficulties of cost estimation process.

- It determines the need for the precise cost estimation of activities cost rate.

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Attached No. 1 Proposed process and model of using ABM in railway management