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Investigating the Role of Information Technology in Managing Interorganizational Costs (Case Study: Electricity Department of Khorasan Razavi Province)

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ABSTRACT

The advent of information technology has made managers gather more and update information in the organizations. In the information arena, managers confront more complicated environments which make it difficult to keep competitive advantages in long term. From the other hand, the weakness of information systems of management accounting is a well-known fact. So, the managers are aware that they can't survive without having a proper and efficient information and control system. As a result, they welcome new accounting information system called cost management. This article tries to identify the relationship between information technology and cost management inside the organization. Analyzing interorganizational cost management, first, it was divided into constituents and then, the relationship between information technology and interorganizational cost management was examined in each section. Finally, according to the resulted points, the conceptual model of this paper was represented. To investigate feasibility and correctness of represented conceptual model, the applications of it was tested in Electricity Department of Khorasan Razavi via interviewing some financial, budget, and information technology experts.

KEY WORDS: Cost management, information technology, interorganizational cost management, accounting information system.

1. INTRODUCTION

Many scholars believe that the present time is the information arena. In general, the studies show that 90% of all knowledge and information that the human-beings have received during history have been resulted in the last decades. Nowadays, information is considered as one of the production factors along with work and capital, playing an important role in production process (Fakharian 1996).At the moment, increasing global competition, higher customer demands, and reducing life recycle of the products, organizations found themselves amid a big revolution and changes. Market determines the prices and these prices identify the profits. In such market-based and customers' need-based economy, the organizations try to maximize customer value and minimize the prices. Since the organizations have more control on the costs rather than prices, they have resorted to cost management to fulfill two apparently contradictory goals of increasing value and reducing the prices (Pillai 2002). For the advances in technologies and informatics revolution in global market, the managers of economic units have been made to offer favorable services to the customers with low prices. In other words, information has changed many aspects in the lives as well as in the accounting systems. As a result, providing this information needs an efficient system, considering competitive conditions and economic status (Raisi 2004).

This paper first examines the definitions and concepts of information technology and cost management and then investigates the correlation of them.

2. Information technology

Information arena appeared as a result of the movements of the societies from industrial to informatics revolution. Many countries are trying to join this stream to achieve economic, cultural, social, and political development (Mutula 2006). Started by the advent of PCs since 1980s, this arena has changed different aspects of personal lives and global interactions because of providing high volume of information and easy access to them. For the high speed of changes in this period, adoption with them should be a priority since continuing the previous methods will be very risky. Nowadays, power symbols have changed from having factories and productions into having intellectual assets in different sections of the society(Moradi and Hashemi 2006).

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A simple definition of information technology can be data processing, maintaining, collecting, storing, distributing, and safety. So, 3 basic continuums of information technology are software, hardware, and knowledge management. Some scholars define information technology as a science based on information processing, management, and cheap information inputs resulting from technologic advances in microelectronics(Parvizian and Saremi 2006). In a general classification of informatics systems,grouping is according to the performance, based on the systematic support of specific performance areas in the organization.
Different informatics systems can be as follows (Sarafizadeh 2005):

1. Financial informatics system
2. Accounting informatics system
3. Production informatics system
4. Marketing informatics system
5. Sale informatics system
6. Informatics systemof human resource

A system that supports the correct and fast information is accounting informatics system which is a manifest of information technology's presence in the accounting cost management; this is the main focus of this article as well.

3. Accounting informatics system

Accounting informatics system is one of the organizational applications relatedto the information technology which provides necessary information for decision-makings of the users through processing financial events and warning information (Conner and Wcoviello 2004). This is necessary for the organizational success in long term and measuring the quality of its performance. Allthe organizations need measuring the effects of different events on their under-control resources. This system plays an important role in the acceptance and survival of a strategic situation in the organization.

4. Cost management system

In the present competitive environment, the existence of enough information is necessary for the success of an organization, although incorrect information endangers the competitive situation of the organizations. Cost accounting provides this valuable information in operational and managerial levels. Inthe present world where competitive advantagesare volatile, costs should be managed cleverly, because an organization which fails in controlling and reducing its costs, decreases its marginal return and endangers its status in the market (Kumala et al 2002). For being an efficient accounting informatics system and away from dangers, an internal control system including control activities, communicative processes, and supervision is essential. The management should be always careful about the efficiency of its internal control system since its good function provides the benefits for the stakeholders in the company (Sheri and Azinfar 2008). One of internal control systems is cost management system. Cost management is aregular, systematic, and structured attitude, spread in the whole organization, providing a comprehensive working frame for the employees to control or remove excessive costs via value chain. Cost management is a powerful tool for the companies looking for the competitive advantages (Hilton 2008).

1.4. Cost concept

This is an accounting philosophy that "the costs will occur" so they should be measured correctly. The costs result from the management'sdecisions. Thus, the companies should focus on the cost management to reach long-term competitive advantages. Cost decrease can result from decreasing production capacity or improving efficiency; but, if it results from decreasing production capacity, the company will be out of the competition market. Thus, cost management is definitely a competitive advantage. The focus area for reducing costs includes (Pillai 2002):

1. Financial management
2. Reducing material costs
3. Managing energy costs
4. Improvement process
5. Inventory management

Because of many producers following due manufacturing, many managers try to reduce or removetransportation costs of the products (Hilton 2008). As an old proverb says "time is money", time economization accompanies monetary economization (Torin et al 2007). Since costs are the main incentives for the companies to reach competitive advantages,

cost management is more strategic than operational (Pillai 2002). The companies using cost management reach 5-10% benefit of economizing in costs (Pillai 2002).

2.4. **Definition and the importance of cost management**

Nowadays, the weakness of management accounting is a well- known fact. Since the information of management accounting results from the trends and cycles of financial reporting system in the organization, it is late, enormous, and diverted. Thus, new and efficient cost accounting systems should:

1. Have multi-dimensional focus on cost goals like, customers, services, operations, processes, and activities.
2. Have less concentration on cost tracking and reporting but focus more on planning and control.
3. Support key business decisions including resource-search, pricing, efficacy and efficiency criteria, deleting a product, and producing a new product (Kumala et al 2002).

From the other hand, tendency to increasing globalization in many markets has increased the pressures for reducing costs. Customers and consumers always create value and show less loyalty to a specific brand or producer. In this challenging environment, cost management philosophy is recognized as a management knowledge which can mix pricing strategies with supply chain management and provide opportunities for reducing costs and increasing organizational benefits (Christopher et al 2005). So, the present competitive world necessitates the development and complexity of cost management for decreasing costs. Cost management is a philosophy, behaviors and a set of techniques for creating added value or a lower cost looking for the long-term achievements of a company (Copper and Sokaplar 2003). Cost management refers to the all processes leading tofinishing a project with a predetermined budget for it (Sohrabi et al 2006). Then, the role of cost management in measuring, collecting, analyzing, and reporting the information is efficient and on time. In a book titled “cost management strategies for business decisions”, Frank Helto,Ronald and Whilton have referred to cost management wastes as occurred costs, accepting thatall costs can be managed to achieve organizational goals(Copper and Sukaplar 2003).Cost management includes 3 key elements:

1.***Value chain analysis***. Value chain has been widely discussed by Porter including every activity for producing or representing a product or service to the final customer, added to the chain or the costs that can be reduced by investigating every section in the chain. These activities have been developed from raw material producers to the deliverers of the final products (Kumala et al 2002).

2.***Analyzing strategic situation*.** This refers to the cost manager’s role in supporting organizational value for the customers, depending on the situational strategy of an organization in the market like cost, dependent, innovative leadership or a combination of both. This strategy has more emphasis on cost management.

3***. Analyzing cost stimulator***. This analysis aims to examine how the processes, activities, and decisions create some costs in supply chain.

None of these 3 elements is cost management by itself;but, a combination of them makes cost management (Kumala et al 2002). In general, the following goals can be mentioned for the cost management:

1. Measuring the final price of the resources spent for doing main procedures of the economic unit
2. Recognition and elimination of the items without added value
3. Determining the efficiency of the main procedures in the economic unit
4. Identifying and evaluating new activities that can improve the future performance of the organization (Raisi 2006).

Cost management is a powerful tool for the people looking for competitive advantages.

Under- consideration issues for the cost management are as follows:

1. What are the costs and benefits of your products?
2. How do you get informed about resource allocation for your decisions?
3. Do your costs have an ascending trend despite the attempts for decreasing them?
4. Can you reduce the prices and increase customer value?

If the answer is no to the above questions, the organization should move toward cost management.Increasing competitiveness environment, inefficiency of an organization becomes an opportunity for the others. Most of this inefficiency comes from the activities without added value in the system (Pillai 2002).

3.4. **Cost management system**

When Aerotech Company used transaction-based costing system in its factory, enabled its manager to understand the reasons of decreasing the price of Model 2 boards which had large number. Moreover, high cost and low amount of complicated Model 3 boards got evident. This type of analysis done by the financial manager of the company is called strategic cost analysis. To facilitate pricing decisions, new costing system provided a novel horizon of management accounting’s role in Aerotech. At this time, the manager looks at its own accounting system like cost management system

which is much more efficient than its traditional counterparts.Cost management system is a control and planning management system, while traditional costing systems stress the reported and retrospective data (Yazdan 2009). According to Porter, the company, selecting and fulfilling cost management, can face competitive pressures (Noorifard et al 2009).The goals of cost management are meeting customer's needs, satisfying customers, and helping decision-makings in all organizational levels (Ramezani et al 1997). Cost management provides competitive advantages for the organizations if one of the following situations occurs:

1. The company is more competitive than its rivals.
2. The company offers more valuable services/products.
3. The company has superior knowledge and more capable employees for producing new services/products (Fawcett 2007).

Cost management information is necessary for all 4 management tasks:

1. Strategic management information which is considered when the manager selects production line, production methods, marketing techniques, and other long-term issues. It also supports management's decisions by introducing and measuring the effects of replaced decisions, potentially affecting organizational operations at all levels.
2. Planning and decision-makings in on-going operational issues like, managing cash flow, budgeting, material purchase, timing, and pricing
3. Operational management and control for increasing customer values by introducing the opportunities for eliminating the operations and processes that are without value but are supported by the management.
4. Identifying the correctness of financial statements, implying the comparison of financial statements for the correct performance of them based on cost information needs, resulted from cost management information system (Fawcett 2007).

So, a high-quality system for cost management should have a comprehensive perspective toward the whole organization (Koocheki 2005). To sum up, it can be said that due to the increasing competition in the market and the importance of the costs in the organization and their determining role in the success or failure of a project, decreasing or eliminating costs can lead to the competitive advantages in long-term. For this reason, the organizations have moved from traditional systems to new system called cost management system. This system is internal control system which seeks to increase added value, decrease costs, and create competitive advantages in long-term.

5. The relation between cost management and information technology

Some organizations consider developing new products as a competitive advantage. These innovative companies have usually higher revenue than other companies. However, innovation advantages are volatile and disappear when new products enter the market with lower price and higher quality (Olram et al 2008). But, the correlation between information technology and cost management should be searched in cost management concept.

5.1. The relation between information technology and inter-organizational cost management

Significant and efficient information, classified in accounting information system, answer the questions posed in cost management:

1. What do we spend money for?
2. How much do we spend?

Answering above questions leads to posing other questions which produces cost management operations:

1. What directs the occurred cost?
2. Does this need agree with business goals?
3. Does business understand this dynamism?
4. How ascending cost trend can be managed?

If an organization faces and answers these questions, a coherent cost management will appear. But developing these actions depends on the provided information in the organization (Hennigan 2002). In other words, developing cost management, either conceptually or practically, needs using IT. Cost management processes are as follows (Cooper and Sokaplar 2003):

Planning resource → *cost estimation* → *Budgeting costs* → *project control*

First step: planning resources

Cost management starts by planning resources in which experienced people, called predictor experts are involved. At this stage, attempts for planning resources are boring and erroneous without proper management software. The byproduct of this process is describing needed resources and due time for them (Cooper and Sokaplar 2003).

Second stage:cost estimation

In cost estimation stage, different estimations include:

Bottom- up estimation. In this estimation which yields more correct results, detailed and documentary, but time-consuming data are used.

Comparable (top-down) estimation. In this estimation historical cost data of similar projects and previous similar activities are used for estimating total cost of the project. This method has lower cost than previous one but needs experts' ideas and judgments.

Parametric estimation. This estimation uses math models, finger tip rules, and cost estimation relations to estimate the costs of project elements. Cost estimation is the correlation of cost and work amount which needs computer tools. Thus, at this stage, the basis of cost management is information technology.

In fact, in the stage of cost estimation, computer tools from Excel to estimation software are used. Here, information technology reduces calculation errors, increases estimation speed, and allows multiple options of the costs to be examined (Hennigan 2002).

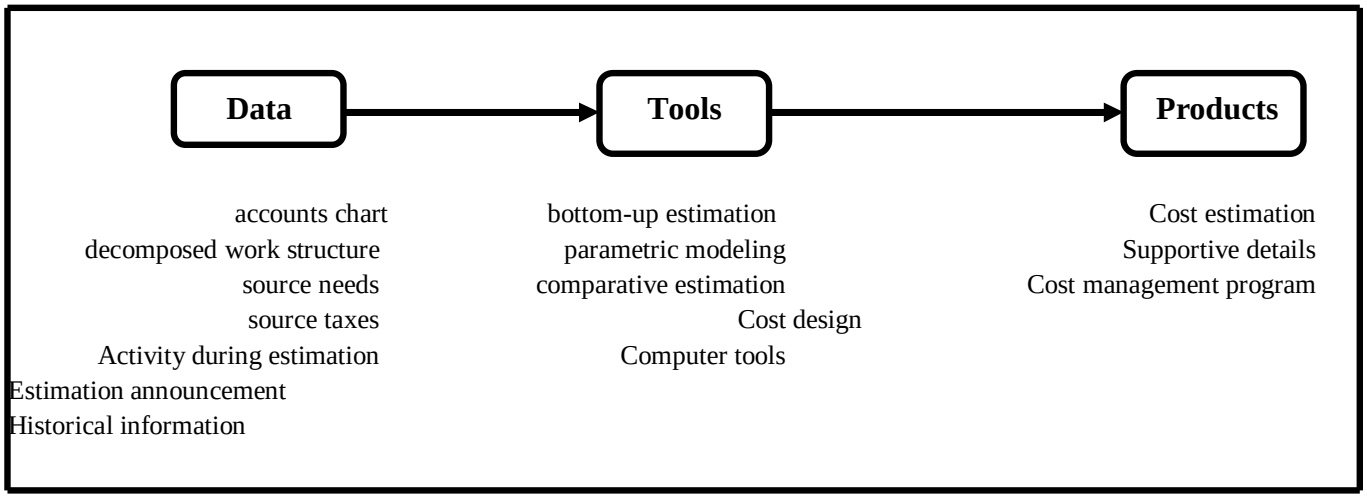

Figure 1. Cost estimation process (Cooper and Sokaplar 2003)

The following information is regarded for using in the cost management plan:

1. Cost data which are gathered and analyzed
2. Datacumulative frequency
3. Analysis methods
4. People and organizations involved in projects and their responsibilities
5. Acceptable change limitations, real and basic costs
6. The interactions of cost control process and change control process
7. Trends and responsibilities for unacceptable changes in costs (Cooper and Sokaplar 2003)

Stage 3:Budgeting costs

Due to resource limitations, this stage is necessary for cost management. Estimation and costs, working analyzed structured duties, resource inventory, and expected capital and benefit should be coherent in the time frame of a project. Diversion from this budget is a big danger for the management to return the project in the correct direction by his intervention. Different tools like, computer software are needed for budgeting project. There are some software packages for supporting budgeting and facilitating the communications among budgeting members like Budget Plus and Budget 2000.Coordinating capabilities in budget software are as follows:

1. Decreasing time and activities in budgeting processes
2. Investigating and analyzing the factors related to the environmental and organizational changes
3. Analyzing different aspects of the budget
4. Automatic representation of exceptions, patterns, and trends
5. Continuing and embedding planning in the organization

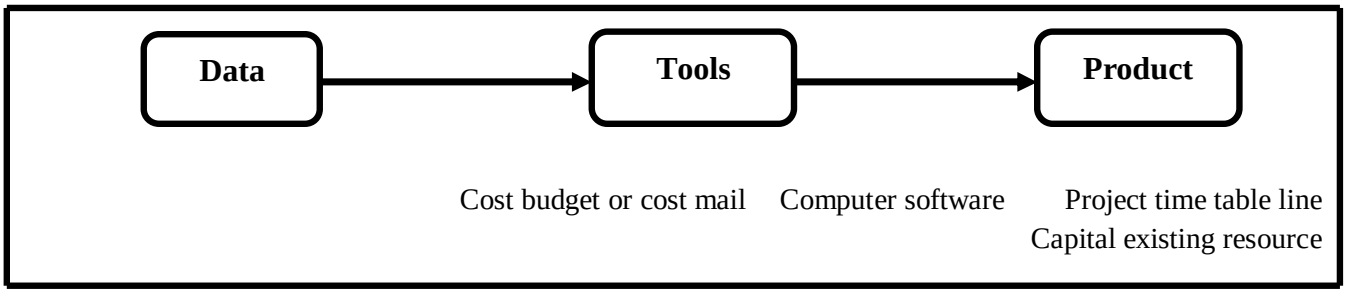

Figure 2.Cost budgeting process (Cooper and Sokaplar 2003)

Stage4: project control

This stage is the most vital stage for the success of a project and includes the attempts for keeping the actions in the main direction of cost budgeting.

The following activities explain the process of cost control:

1.Controlling the project for making sure of being in correct direction

2. Changing project performance to place activities in an acceptable budget frame or rearrange main estimation of the project which is probably wrong; all of them necessitates increasing capital/budget or decreasing project range.

3. Preventing from unconfirmed changes for the cost project or budget.

When maintaining current budget is not possible, the process of cost control extends to include the following actions:

1. Managing project until exploring the possibility of new changes in the costs

2. Registering legal and correct changes in the budget

3. Informing change beneficiaries(Cooper and Sokaplar 2003).

Informatics systems play an important role in control supporting. Information technology is a good supporter of control and discrimination. Software package that can be used in cost control include Comshare Budget Plus (Momeni 2002). Figure 3 shows the process of cost control and the role of information technology in it.

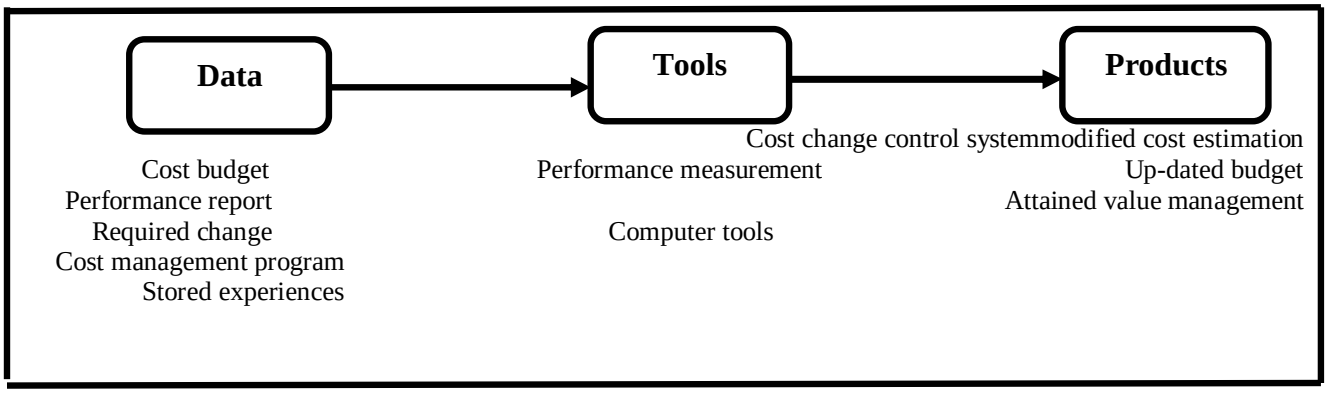

Figure 3. The process of cost control (Cooper and Sokaplar)

At this stage, using computer tools and information technology, the program and process of cost management is processed and its probable distractions are explored and converted in finished projects and finally, a series of experiences are stored. As seen in all cost management project's stages, information technology is widely and unexceptionally used in them. In other words, IT is the basis of this system and a powerful tool in cost managers 'hands. Figure 4 shows the conceptual model of IT role in the process of cost management.

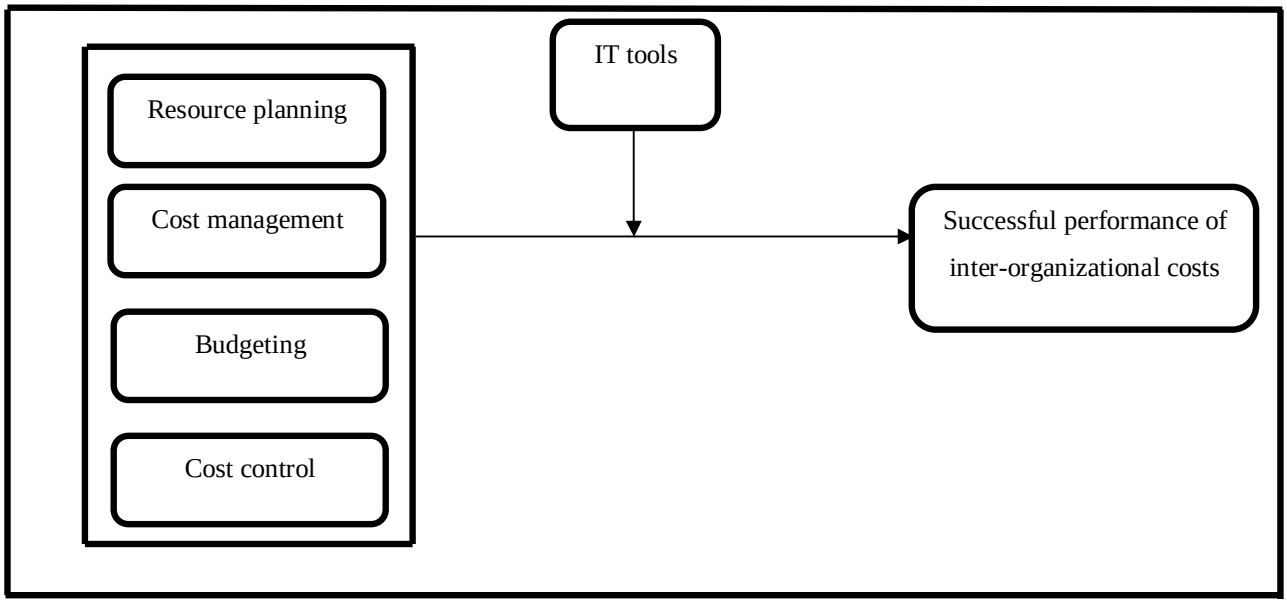

Figure 4. The conceptual model of the research (made by the researcher)

6. Regional Electricity Department of Khorasan

Regional electricity department of Khorasan is responsible for providing, transferring, distributing, and selling enough and safe electricity power to Razavi. Northern, and Southern Khorasan provinces based on the related standards and regulations. To fulfill its goals, superiority in industry and being the best server, this organization has used an integrated IMS system with global standards. To examine the conceptual model of this research and IT role in it, some budget, financial, and IT experts were interviewed in Regional Electricity Department of Khorasan in which used software in every inter-organizational cost management stage and their advantages were investigated.

The results of interviews showed that in this organization inter-organizational cost management system is used as the management system of capital schemes. On this basis, in the first planning stage, the resources are provided using electricity bills, loans (cooperation loans),general governmental revenues, and selling electricity to industrial consumers. In this stage, WES is defined which is recognized as work line at the last analysis level. Financial resources include machinery, equipments, and etc. Used software at this stage was NSP software. The output of this software was resource planning. This system has the advantages like decreasing paper and pen usage, need to less inputs, and economization in time and money. In the second stage called cost estimation, parametric method is used. The costs are adopted due to the limitations and resources at the service of the organization. At this stage estimation with 3 criteria including optimistic, pessimistic and the most probable are used. These 3 criteria are determined according to the ideas of consultants, executives, contractors, and engineering offices.

$$\text{Best probable} = \frac{\text{(Most probable) } 4+\text{pessimistic}+\text{optimistic}}{6}$$

In the second stage of cost management, based on the math rules and consultants, parametric method is used which leads to decreasing human errors and more accurate predictions of the events. This system causes the more reasonable estimation trend considering the most effective factors in decision-makings.

Third stage called budgeting is financed by budgeting office through ERP. This system leads to the integration and amalgamation of information through different sections of the organizations, enabling accessing to the information of other sections. Such capability leads to more transparency in people’s views and recognizing real needs of the organization. Cost and time reduction for budgeting and coordination of internal sections of the organization are the advantages of using resource integrating system.

Final stage, cost control, used by the project control unit, examines the percentage of physical advancesand the magnitude of done work for contractors. In this stage, a comprehensive financial system is used, decreasing excessive bureaucracy and human errors.

7. Conclusion

The present era is the time of information and technological advances, making companies use cost management for surviving in the competitive markets. For examining the relationship between cost management and information technologies,the stages of cost management were introduced and explained. Starting with resource planning, the role of IT and software helping experts for determining the resources and due time for their usage was highlighted. In the second stage, estimation was used. Here, it was observed that the probability of estimation complexity increases without using computer tools or Excel sheets. In the third stage, computer software's role was understood by recognizing diversions from the program. In the fourth stage, the most vital one for the success of the project, IT played an important role in project control. Using computer tools, project diversions were recognized and finished projects, correct activities, and experiences were recorded and stored for the future.

Thus, cost management appeared as a result of globalization and information revolution to balance the relation between value increase and cost decrease for which it depends on IT. In all these stages IT helps experts to produce reliable cost management information.For an applied investigation of the conceptual model of this study, financial, budgeting and IT experts in the organization were interviewed. The results showed that Regional Electricity Department of Khorasan uses cost management as an integrated financial system. This organization also used NSP system in planning stage,parametric method in cost estimation, integrated planning system in budgeting stage, and a comprehensive financial system in control stage. Using these systems leads to decreasing bureaucracy and economization in time and money.

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