PERFORMANCE OF MANAGEMENT INFORMATION SYSTEM IN CONSTRUCTION INDUSTRY

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Abstract- Information is the study of different resources and their allocation and Storage for an organization. Strategic Management Information System is the method by which this stored information will be processed and reused wherever it is required. In construction firms, MIS is equally important for all the resources viz. Man, Machines, Money or Materials and other environmental factors pertaining to particular construction activity.

Keywords: Strategy, Information, ICT, Scientific Management & Construction, Machines.

Introduction

With new research and developments, the field of project management continues to grow in terms of knowledge and practice. Project management has been accepted by many industries and, with on-going globalization, international projects and markets, is practiced almost the world over. In India, however, the construction industry has been and still is very labor intensive. Over a long period of time the Indian construction industry has experienced very few changes in terms of new technologies and advanced methods. This is understandable to some extent, as current practice utilizes the labor force available and aims to provide maximum employment opportunities. With ongoing developments and the future interest of many international organizations, however, consideration needs to be given to adopting advanced methods of planning and execution of its various projects. This will set new standards, provide firm structure to the industry and make it more efficient and productive.

The paper explores areas such as: the current economic status of the Indian construction industry; the knowledge the industry professionals have of project management and its methods of dealing with various projects; the problems faced by industry professionals; and awareness of the structure or pattern that project management can provide to the industry. Further examined are the changes taking place to improve industry standards; encouragement and support for methods such as project management by the industry and various organizations; efforts made to improve efficiency and productivity; other factors such as competition, transparency and modernization, which demand changes in the industry; the difference in implementation of project management in the public and private sectors; and the future challenges for the industry.

Objectives

The aim of this study is to explore the existing common practices in construction resources management for the building construction projects in construction industry. This aim can be broken down into the following objectives

- To review literature related to the construction resources management, and also to review the relevant software packages.
- To investigate the local practices of construction resources management in contracting construction industry.
- To get the idea about resources prices, resources availability, and resources management.
• To assess the impact of computerization on construction resources management.

The survey

Method

The questionnaire was piloted with two associates from the Indian construction industry – a Senior Architect and a Planning and Project Control Manager - to check the relevance of the questions asked and of any difficulty in understanding and answering them. This led to some minor changes in the questionnaire concerning some ambiguity in questions and rewording of questions. The final version was sent to a convenience sample of 150 organizations and potential participants for response via email. The potential respondents consisted of various project managers, architects, engineers, surveyors and consultants currently active in the industry in India and considered capable to providing the required feedback.

A total of 51 (34%) responses were obtained – a reasonable rate for this type of questionnaire. The reasons for non-response are assumed to be the busy schedule and lack of time for potential participants to complete the questionnaire rather than any possible source of bias. The respondents comprise 21 architects, 9 project managers, 2 surveyors and 19 engineers. All are currently active in the industry, with a minimum of 5 years work experience, and are well qualified professionals, with a minimum of a bachelors’ degree qualification. For the analysis, the responses were divided into three conveniently sized groups of: architects, engineers and other (project managers/surveyors) respondents.

Methodology

The study is conducted through the following stages:

• The first stage was literature review. In this stage resources management related literature was reviewed to identify the main topics and concepts that related to this research. This stage included also a review of available resources management software packages.

• The second stage was field survey. During this stage, a survey of the local resources management practices of contracting companies in Construction industry was made. An (80) structured questionnaire with 40 personal interviews is used together in this study and the person in charge of managing construction resources in the company was interviewed. Statistical analysis for questionnaires was done by using Statistical Package for the Social Sciences (SPSS). Discussion for the obtained results was also made.

1. Population and sample

The studied population includes the contracting companies in Construction industry who have a contractor's union valid registration in January 2012. As resources management is a somehow sophisticated activity, the researcher addressed his study towards the top contracting companies of the first, second, and third class according to the contracting Union classification. The total number of these companies is 80 companies and they are stratified as follows: the first class has 35 companies; the second class has 20 companies; the third class has 25 companies.

2. Data collection and questionnaire design

Few methods of data collection were used including observation, documentations, interviews and questionnaire and documentary analysis. The questions of the research questionnaire are constructed based on: Literature review, 5 interviews with
contractors to obtain different thoughts, which can be useful for creating questions, and the experience of the researcher and some engineers in construction management in Construction industry. The questionnaire was built mainly using closed questions, and it was divided into five sections as follows: company profile, of construction resources management tools and techniques in construction projects, the effect of closure in Construction industry on materials, equipment, skilled workers and technicians’ availability and cost, computer applications in resources management systems in construction projects, and Implementation of construction resources management systems.

3. Data analysis and results

a) Company profile

The result demonstrates that the building represents the highest field of work for contractors with 96.3 % (77) in buildings, 50 % (40) of work were in roads and transportation, and 37.5 % (30) in water and sewage. The frequency and percent of job title of the respondent was 35 % (28) of contracting companies respondents were Director / deputy director, 35 % (28) were projects managers, 22.5 % (18) were Site engineer and 7.5 % (6) were Others. Also the number and value of executed projects during the last five years result was (31.3%) of contractors executed less than 10 projects and only 6 contractors executed more than 50 projects. The majority of contracting companies (49%) executed from 20 – 50 projects in the same period. (haddad E. 2006) concluded that (26.3%) of the contractors using a computerized form for providing a list of materials in project that includes for example (material name, material number unit price). But Al Ostaz, 2002 concluded that (75.6%) of the contractors using this technique without recording (in memory). This result indicates that construction industry became big sized projects (5).

Also, (26.3%) of them using a computerized form for providing a list of equipment in project that includes for example (equipment name, equipment number, and equipment price). And (30%) of them using a computerized form for providing a list of names and numbers of skilled workers and technicians required for the project.

b) Application of construction resource management tools and techniques in construction projects

Data result demonstrates that “establishing databases for construction materials techniques” group was in the highest position and the importance technique in this group is establishing categorized materials database. While, “Updating the databases of skilled workers and technicians” group was in the lowest position and the importance technique in this group is updating the database of local skilled workers and technicians. Also, the importance technique in “Creating databases for skilled workers and technicians” group is establishing categorized database for skilled workers and technicians. And, the importance technique in “Updating databases for construction materials” group is Updating the database of local suppliers.

c) Method of use some techniques in construction resources management

The result demonstrates that the contracting companies used many techniques for managing construction resources. It shows that (26.3%) of the contractors companies using a computerized form for providing a list of materials in project that includes for example (material name, material number unit price). But Al Ostaz, 2002 concluded that (75.6%) of the contractors using this technique without recording (in memory). This result indicates that construction industry became big sized projects (5).

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d) Using software for supporting the construction resource management

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The result demonstrates that (1.3%) of the respondents do not use computer applications in resources management systems in construction projects and (90%) use spreadsheet-based software like (Ms Excel) because it is a familiar application for all construction companies. On the other hand (8%) of the contracting companies use specialized software and this is somehow very good to implement GSCRM on construction projects. Haddad (2006) concluded that (28.6%) of the respondents do not use computer applications in resources management systems in construction projects and (61.9%) use spreadsheet-based software (7). This difference indicates Contractors reliance on computerized programs in their business and increase awareness among contractor’s modern techniques.

e) Importance of resource management systems to solve some problems
The result shows that (35%) of the respondents believe that using resource management systems can reduce deliver materials with wrong quantities. And implementing the system reduce destroyed equipment when deliver problem. Also, (18.8%) of the contractors said that resources management system can solve the unavailability of workers and technicians. it also concluded that the application of construction resources management system has an effective role in reducing many of the problems and lack of material entirely, lack of material in the quantities required, and the late arrival of materials and accumulation of material in the stores.

f) Techniques used for ordering materials and equipment from suppliers
From the result obtained, it has been found that most of contractors (100%) use the telephone for ordering materials and equipment from suppliers and (97.5%) use personal meeting for ordering, (90%) of them prefer to use the fax for ordering materials and equipment, while (82.6%) of respondents use the E-Mail, and (82.5%) of them use internet for ordering materials and equipment from suppliers. It is noticed that the telephone is the most important tool for ordering materials. This result may refer to the fact that in construction industry construction materials and equipment are ordered from local suppliers.

Conclusion
It is well recognized now, as detailed in the present study, that construction is a high risk, multidisciplinary activity carried out in an uncertain environment. It requires an assembly of specialists of different fields to carry out a specified task within a given time and cost span. Any conventional, standard and bureaucratic organizational structure will be misfit in construction environment. In addition to the above, construction is basically a database industry, in which multitude of time, cost, performance, quality and productivity “data” is being generated at each site and continue to be generated at a phenomenal speed.

It is required to be stored, transmitted, classified, analyzed and synthesized at a very fast speed to be converted to “useful” information. This information is again required to be more finely treated and analyzed to be converted into useful blocks of production industries. The organizational structure, required to be designed for construction industries must therefore, necessarily be organic, self-learning, dynamic in nature. The typical model for such organization can be based on information system and human mind. Multi-agent problem solving is to be a basic characteristic of such an organization, based on the concept of pluralism. In the turbulent environment of the present times these initiatives are necessary for organizational survival. A model is developed in the present work for the construction environment, based
on high horizontal differentiation, low formalization, low vertical differentiation and great flexibility, responsiveness and knowledge base, capable of self-learning and adaptive to rapid changes in environment through strategic management information system. This model will help in creating the knowledge base of the organization and its continuous updating and making it self-learning, formats of data collection, its classification, storing and analysis, and are specifically designed for construction industry. Model will self analyze and synthesize the data into information and its further refinement to knowledge modules which can be used in variant conditions.

REFERENCES


