

Research and Design of Management Information System Based on Infrastructure Projects

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Abstract

In infrastructure project of management in the involves numerous infrastructure archives of management problem, infrastructure archives is infrastructure management and infrastructure project activities process in the directly formed of, has save value of text, and chart and the audio carrier information, is College campus in the various buildings, and structures and ground, and underground pipeline, basic construction engineering of planning, and design, and construction and using, and maintenance, and overhaul activities of directly records; is on College construction project for examiner, and audit, and supervision, and management, and acceptance and school future modified expansion, and Maintenance carried out according, to build on basic construction archives management, c/s and b/s mixed structure, the introduction of new technologies. NET Framework design of College capital construction project management system. realization of management automation and real-time, rigour, to improve the effectiveness of the objectives.

Keywords: College construction project; management information systems

1.1 Background

With the rapid growth of the national economy and social progress, fundamental construction in colleges and universities in China have continued to evolve and change. How to move with the times and adapt to the development of the times and requirements, break through the constraints of higher education development in infrastructural projects as soon as possible "bottlenecks", became the focal point of University's construction management work. Complex context at this stage, and improve the level of its overall management in colleges and universities, enhance the adaptability and competitiveness of enterprises has become a construction enterprise there is an urgent need to address the issue, while information technology is most effective way to solve the above problem. Modern computer technology, network technology and the rapid development of communication technology and its broad application in the areas of project management, making project management information technology has become an inevitable trend, also became an important means of improving project management.

With the development of market economy, information management of College capital construction projects become more complex, the striking features of the main performance:

(1) Large amount of information

This is mainly because construction projects involving management department, link, purpose, channels, form are many.

(2) Information of systemic

Due to infrastructure projects ChanJianXing and one-time, so although large amount of information, but are concentrated in the project management by object, easy to systematic, which for the establishment of information system and application created very favorable conditions.

(3) procedural

Project implementation showed a strong procedural, either single items of projects or subdivisional work, their implementation steps is a ring by ring, fully carried out in accordance with the standard and fixed process mode, managers according to the work plan in advance can fully grasp the project development.

(4) The complexity of associated

Because colleges and universities is department, management agencies to follow authority of a set of patterns, so its engineering project management mode is also corresponding with the authority management model. Colleges and universities in a project from start to the process of implementation, completion and acceptance, multiple departments, school principals, audit division, the bursar's office, member, matters, etc. - need to work together, any link has a problem, will lead to the failure of the project.

The particularity and complexity of engineering construction management and control is a complex, cumbersome and powerful a lot of work, the traditional construction project management mode, the need to manually and half manual processing projects at various stages of information, its on the speed, reliability index has caused managers. Introducing the MIS, in the management of infrastructure projects from the engineering project, establish a complete set of management system, so as to reduce the burden of staff, and make the school informed of the progress of project management department, engineering archives information at any time, coordination, and timely make the relevant decisions, eventually achieve the goal of improving work efficiency and management level.

The universities capital construction management information system is still in the exploratory stage, the application of information technology for active and effective management of project level is still low. Use of the information management system of the vast majority are still in a single business and in stages, the local application of flow level, this makes the information between various departments, various process not impossible to achieve, interaction and sharing of data. Therefore, we need to go into details of the user requirement analysis, hoping to find universal infrastructure management information system in university, provide reference for the construction of infrastructure management information system, in order to speed up promote the informatization process of university capital construction management, enhances the working efficiency of the construction of colleges and universities, save human resources, makes the construction management of the colleges and universities can work more effective.

1.2 The Functional Requirements Analysis

"Needs analysis" means based on the analysis to solve the problem, to understand the diverse needs of the problem in detail, in software engineering, requirements analysis refers to the creation of a new or change an existing computer system when describing the purpose of the new system, scope, definitions, and function have to do all the work. Management information system needs analysis has been a theoretical research and practice of management information system is an important subject, practice has proved that a set of management information systems development success or not depends largely on the quality of requirement analysis. Therefore, choosing the right demand analysis method, and the comprehensive use of these methods tend to achieve twice the result with half the effort. The demand analysis of the management information system should follow certain principles: shall, before starting the analysis model is set up as much as possible to understand the problem domain; Show the development of prototype for the user, make its can intuitive understanding the human-computer interaction interface; The origin of each requirement and the reason for recording provides necessary foundation for tracing back to the user. As far as possible avoid fuzzy description in the requirement description, for demand through natural language to describe this is especially important. Set different priorities for demand, according to the priority of height decide the order of the requirements to achieve, such as the specific requirements for the highest priority, variable demand as priority, potential demand for the final priority. Using multiple demand view, the establishment of the data, the function and behavior models, the combination of a variety of views can avoid ignoring the possibility of some demand to the greatest extent.

Have understanding of facing the demand analysis on the university capital construction management information system designed mainly to complete the following two goals:

- (1) Content arrangement of each department, and realization of mutual cooperation between departments, giving full play to the advantages of group action;
- (2) The work plan is designed according to the project implementation process, record project information.

So, the staff can timely records in different stages of the project progress, communication projects each item; Managers can be the basis of the data access to, understand the situation; For instructions on department make decisions; Rely on the software platform work instructions, supervise department.

On the basis of the above requirements, the main functions of the system can be determined as follows:

- (1) Provide department collaboration capabilities: scheduling department work content and requirements, and generate, receive, send on daily work of the document, review, approval, signature and archive management; Real-time recording work.
- (2) Provide engineering information management: including provide fixed mode for the user to fill in the progress of the plan, record fund use plan and use situation, the construction process, is advantageous for the engineering quality control, provides the engineering change management, recording materials equipment usage, according to the schedule planning in different stages of the material purchasing list, collection management departments of archives, etc.
- (3) Provide engineering maintenance management: including completed two years of engineering such as water and electricity, maintenance records, campus virescence maintenance registration, statistics and query, etc.
- (4) System maintenance: including user management, authority distribution, backup restore database, notepad, calculator, system time Settings, and so on.
- (5) Help: including system help file version information, system, etc.

Project management as the core, in order to grasp the main link project schedule, control project cost, improve the work efficiency and effect of management as the goal, in the early stage of the project approval, the bidding management, contract and implement equipment management, material management, construction acceptance of the whole process of management, engineering settlement to conduct a comprehensive grasp and control, a process that domestic demand to digest the production of documents, data and management. Infrastructure projects are implemented by the application of management information system of the management in colleges and universities, make relevant personnel clear business processing and information sharing, communication is convenient, according to the data accurate, strict control and decision, ultimately achieve the scientific, modernization and standardization of construction management.

1.3 System Module Design

According to the demand analysis, and considering the factors on the level of development, system is divided into basic information management, information management, engineering maintenance management, system management and help five functional modules, such as on the basis of the five modules and divides the cooperation unit management, personnel information management, contract management, and other 12 small modules, each module relational structure as shown.

In view of the above analysis, in the management of construction project management system module one of the most important engineering information management module, the module type is a concrete analysis of the module. The module includes six units are respectively the cost of investment control and management, bidding management, the project schedule management, information and document management, materials, equipment management and contract management. They each role is as follows:

(1) The investment control and cost management

Associated project accounting system, the custom cost estimation basis, to generate cost estimate table, in the process of project implementation, the refinement of cost performance goals. Based on project investment estimation, budget plan, contract information, contract execution and settlement of tracking management, according to the system as a whole the information summary form the project's overall financial information collection, cost control and cost analysis at any time, at any time to understand and unilateral total project cost cost, all kinds of cost, provide the basis for management decisions.

(2) Contract management

Formulation and implementation according to the contract, on the one hand, to implement the contract unit, contract value, contract changes, contract payment and other key information input, on the one hand, implementation project funding program control of the contract, contract execution, and able to contract management, multi-level according to different requirements generated contract report, for different managers understand basic information, the contract at any time by generating a contract account, classified summary table, GeTongKuan statistical analysis, contract variation statistics document enables managers from various angles such as a comprehensive grasp the contract implementation.

(3) Bidding management

According to the bidding plan project execution plan, will tender announcement, bidding unit of information, the evaluation results to be reflected, including the tender documents, the bid tender documents to the query in a timely manner.

(4) Material and equipment management

For all kinds of supply management, building materials equipment information, supplier information, material equipment price comparison. By mastering a large number of suppliers of materials equipment information, understand the enterprise supply capacity, price level, through multi-level recognition price management, according to different requirements, according to the summary implement different Angle to the project material, equipment use statistical analysis to recognize price.

(5) The project schedule management

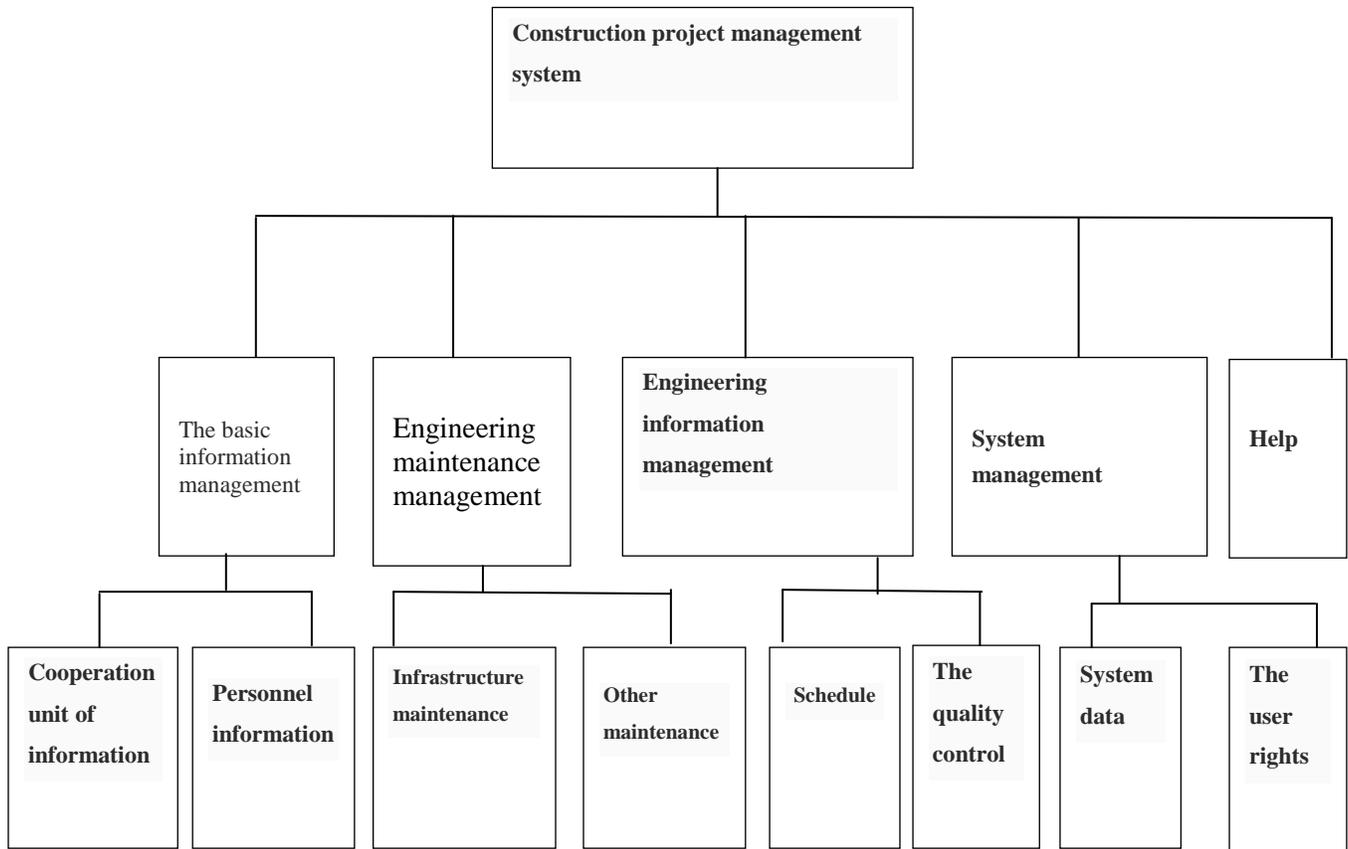
To supervise and control the project progress results, through the gantt chart, network diagram, working calendar, graphical tools such as logic diagram from different sides show the project plan and schedule, timely reflect the progress of the project, compared with plans to find progress deviation, for project tracking and evaluation, payment, to provide basis for decision-making.

(6) Information and document management

Realize the communication and information management, based on the business of transfer the results to relevant departments for examination and approval of work uniform to a platform to work together, to reduce physical waste and waste time, improve work efficiency and effectiveness.

Progress of with the development of colleges and universities, the scale expands unceasingly, paradoxically, with infrastructure projects in colleges and universities due to historical reasons for the lack of modern management ideas and methods, cause in the coming new goal, new tasks, the decision-making errors, improper design and issues such as management does not reach the designated position, quality issues. Therefore, how to make the capital construction management in colleges and universities to adapt to The Times, with scientific management methods and means for its optimization and effective project management is before each university capital construction management research and practice of the project.

The characteristics of university infrastructure projects management information for introducing the MIS laid a solid foundation in the management of infrastructure projects, through the work of construction department in colleges and universities characteristic, the detailed analysis of infrastructure project information process, this system on the basis of the university infrastructure department management work, construction schedule, engineering cost control, engineering quality, engineering data management, engineering, maintenance management, lay the foundation for the realization of the infrastructure project management automation.



Construction Project Management System Module Management

Reference

- B.Bond, Y.Genovese, D.Miklovic, N.Wood,B.Zrimsek, N. Rayner, ERP is Dead. Long Live ERP II[J], Strategic Planning, 2010, (10): 23~26
- Davenport T. Mission Critical: Realizing the Promise of Enterprise Systems[M], Harvard Business School Press, 2009.12~15
- E.J. Umble et al. Enterprise Resource Planning: Implementation procedures and critical success factors[J].European Journal of Operational Research, 2013,146(5):241~257
- Fiona Fui-Hoon Nah, Janet Lee-Shang Lau. Critical factors for successful implementation of enterprise systems[J].Business Process Management Journal ,2009,7(3):385~396
- Injazz J.Chen. Planning for ERP systems: analysis and future trend[J]. Business Process Management[J], 2007,7(5):374~386
- Wehrich.The TOWS Matris-A Tool for Situational Analysis[J].Long Range Planning ,2005,15(2):60
- Adel M.Aladwani.Change management strategies for successful ERP implementation .Business Process Management[J],2009,7(3):266~275
- Kalakota R.,Robinson.E-business 2.0:Roadmap to Success[M], MA:Addison-Wesley, 2010:120
- Zhu,C.Y.,Ma G.H.,New Horizon of Management- ERP and Supply Chain Management,China Electronics Audio & Video Preee [M],2009:115~117
- Kanet,J.and V.Sridharan.The Value of Using Scheduling Information in Planning Materials Requirements[J].Decision Sciences,2010,(2):45~47[40]
- Barney,J.B. Looking inside for Competitive Advantage[J], Academy of Management Executive,2004(6):16~19
- C.Oliver.Sustainab le Competitive Advantage:Comb in ingInstitutional and Resource-based View[J].Strategy Man-agement Journal,2013,(5): 45~46
- Prahald,C.K,Ham el,G.The Core Competence of the Cor-poration[J]. Harvard Business Review,2005,(2):20~24
- Porter M.From Competitive Advantage To Corporate Strategy[J]. Harvard Business Review,2007,(7):35~37