''EXPANDED ROLE MANAGEMENT - CLOUD BUILDING CONSTRUCTION MANAGEMENT SYSTEM''

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ABSTRACT:-

In terms of the construction industry, needs of construction management will differ based on different companies, personnel, projects and time. It is very difficult to meet different construction management needs in the industry with only one system. This study aims at developing a secondary development system that allows different users to design specific and customized construction management systems according to different needs. This study is not for the provision of solutions to single "management issues" but for the development of platforms applicable to various "management types'. Consequently, management efficiency and efficacy of relevant enterprises in the industry can be raised and the overall competitiveness of the industry can be enhanced. System automatic planning, construction, feedback, content adjustment, acceptance test, and procedure confirmation took in total 11 months. To make sure that the problem is helpful for labor dispatch and implementation effectiveness, training courses for competent authorities, special groups and enterprises, open sharing sessions and other qualitative interviews on experience were carried out to obtain feedback of users and thereby adjust platform development. In addition, 360 system users received a questionnaire investigation using a technology acceptance model. Judging from 107 valid questionnaires, the average score of perceived usefulness was 4.38 and that of perceived ease of use was 4.26. In terms of the average of the dimension, there was no significant difference in the background of the different respondents, indicating that most respondents were positive for the secondary development platform regarding construction management assistance and easy operation. Besides, dimensional relationships among perceived usefulness, perceived ease of use, attitude toward using and usage intention all indicate positive influence. During use of the system, feedback will be obtained through the online service platform to made adjustment and continuously offer system services, to achieve the study objectives set.

KEYWORDS:-

Construction industry; cross role management; secondary development platform; Construction management system

INTRODUCTION:-

According to statistics from Taiwan (ROC), the national average GDP in 2016 was about US$570 billion, and the Construction Industry accounted for about US$ 167 billion. The construction trade features a nice impact on the economy. In the construction industry, construction companies, construction plants, construction or technician offices, engineering, and technology consulting companies, engineering companies, material suppliers, construction machinery and equipment sales or leasing industries are inextricably linked. Chen (2011) pointed out in the report on the development of industrial development that the construction industry is vulnerable to the development direction of domestic regulations and policies.

The report pointed out that the construction industry affects several characteristics of upstream and downstream

MANUFACTURING:

☐ Vulnerability to policy impact.

☐ Acts and geographical restrictions.

☐ It needs to be highly integrated.

☐ Work risk factors.

☐ Production time variables.

☐ Human factors.

☐ Capital investment.

☐ Business contract.

☐ The uniqueness of the product.

The information on the built environment is often lost or duplicated with the construction, personnel or organizational changes, which in turn affects the accumulation and inheritance of engineering knowledge (Lu, 2010).

In the face of changes in Taiwan's domestic and international environmental conditions, Taiwan's current construction industry is facing internal problems such as changes in government policy, changes in industrial characteristics and economic environment, changes in social phenomena, and the government's opening up of the domestic market, forcing industries to face External threats such as global competition. It is necessary to improve the competitiveness of itself and the effectiveness of enterprises, and the ecological chain of the construction industry is huge. If it is unable to break through the difficulties, it may affect the development of capital investment, design planning, management, and technical services, personnel construction, equipment and equipment supply, and even influence. Social stability and overall national economic development. Only by improving organizational and personal effectiveness, reducing corporate costs, and increasing profitability, companies have the ability to purchase, develop, or learn advanced tools and technologies to upgrade and deliver better services or products.

1.1. System development purpose

The management of tasks and rewards between different companies or personnel are called "cross-role management", as a result of the development industry-related industries include: construction corporations, construction plants, construction or technician offices, engineering, and technology consulting companies, engineering companies, material suppliers, construction machinery equipment trading or leasing industry, etc., different companies have different task dispatch and return requirements, in addition, a single enterprise may also have different performance characteristics due to department type or project type differences. Even if the same company and the same member execute a project, the task requirements between members will still vary according to the

progress of the project. In addition, the construction industry is often at the same time, and different roles are in different spaces. Whether it is an organization or a person, roles are circulated throughout the work assignment, response, and communication (Lin, 2009).

As the engineering project progresses, different organizational roles are created. For example: from the people, owners, PCM, architects, related technicians, supervision units, construction plants, construction units, etc. Due to the relationship between commissioning and contracting, it is often necessary to communicate and discuss and understand the progress and results. For example, during the construction process, the owner constantly hopes to obtain engineering information and may ask and understand the supervisory role. Whether the reply information is as expected, not only affects the management efficiency, but also affects the progress and quality of the project, and even affects the rate of winning the contractor's next case. Figure 1 represents the role relationship between different units in the construction industry. The management of roles also needs to focus on the operation of information, the decision of strategic goals and implementation plans, and the effectiveness of management and communication.

Construction companies/ Individual parties:

- Contractors
- Architects
- Designers
- Suppliers

Construction industry communications

Building industry authorities:

- Building industry authority
- Building consent authority
- Sitesafe and city councils

Research and professional bodies:

- Building research association
- Certified builders association
- Institution of professional engineers
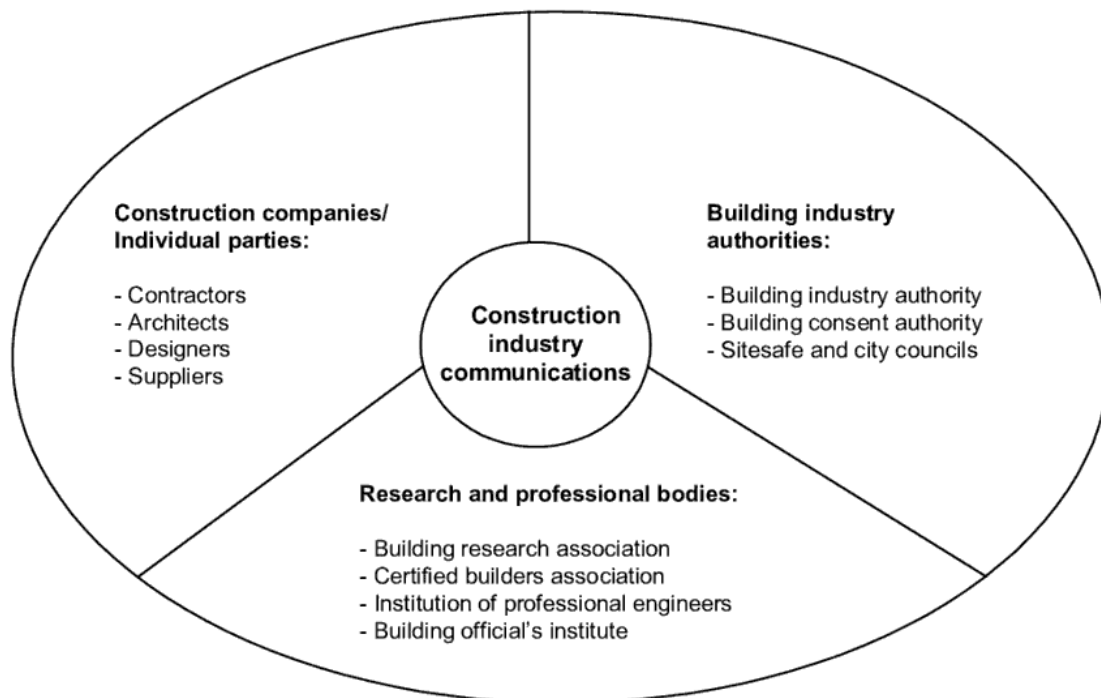- Building official's institute

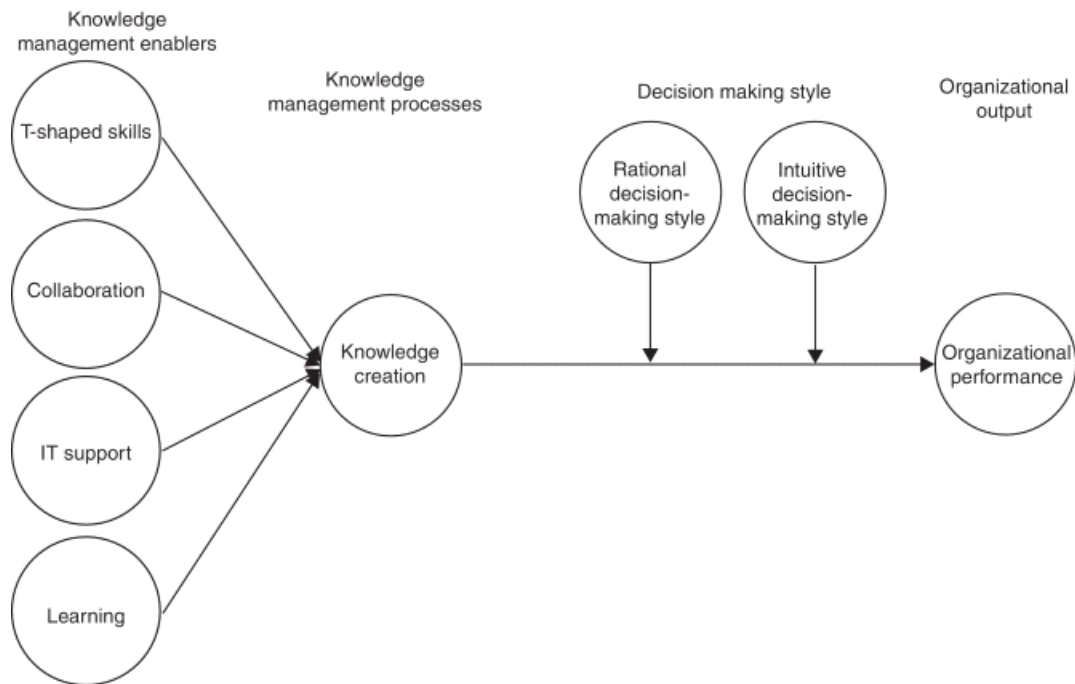figure 1 Construction industry association.

figure 2 Manager task assignment diagram.

There are many tasks on the construction site that must be completed by human re-sources. Different roles define their specific positions, skills, and job responsibilities, as well as different tasks. Works tasks often require constant assignment, response, and communication. In this study, according to the type of task, it is summarized as the manager and the on-site executive. The two work in different spaces and working envi-ronments, and constantly carry out work instructions, execution, and reply to the result message, as shown in Figure 2. The smoother and faster the positive circulation repre-sents the improvement of the work efficiency of the enterprise, and the improvement of the work efficiency means that the cost of the enterprise can be reduced, and the profit reduction is naturally improved. This is a positive cycle for the formation of enterprise efficiency and profitability.

2. System Development:-

The secondary development is based on the existing software and through a certain platform or tool, according to the requirements of customization and functional modification, can make a certain type of application software development and maintenance more convenient, and amplify the reuse of the original software code. Sex. The software produced by the secondary development platform is more targeted than the design function of the original application software and is more convenient for a certain type of user to develop and apply its own products, and the application field is relatively small and the users are less. The purpose of the secondary development platform is to simplify the development and maintenance of application software. The functions and components are usually the basic requirements of some application software. Developers do not need to write the code of the basic requirements, shorten the development cycle and Risk, and directly use the functional modules corresponding to the secondary development platform to meet the customization needs of enterprises or individuals.

Firstly, a secondary development platform (Secondary Development Platform) that can be designed or adjusted by the user according to the task requirements is built. The platform has the functions and flexibility for users to develop and manage by themselves, which can be used by many different construction management requirements of the construction industry. Construct a management platform. In other words, the secondary development platform is not only a single "management issue" solution, but it is also a platform to improve the execution efficiency and management effectiveness of the "management type", and has the opportunity to improve the industrial competitiveness. Aiming at the type of management of public works management in the construction industry, a secondary development platform for cross-role management was established. This secondary development platform is aimed at the management type of construction management related to the construction industry. Users can then create a a customized system that meets specific time and space conditions or solves targeted work management issues through the secondary development process. This study establishes the above-mentioned public works management system for secondary devel-

opment and calls it the "BMS Cloud Construction Management System".

Considering the role of the user of the "BMS Cloud Construction Management System" and the different needs of the role in the management of the work, the system is divided into three parts: the manager platform, the user interface, and the cloud database. In the architectural relationship, the administrator platform designs and dispatches the task to the designated user. The user collects and executes the task through the smartphone, and uploads the photo of the task completion to the cloud database. The administrator connects to the cloud database to store, analyze and manage the data for the execution results of different tasks.

3. BMS system results

3.1. Manager platform

The manager platform uses a web page format. Huang (2014) research on the network teaching platform pointed out that users pay more attention to the design of the network platform. The administrator platform uses CSS (Cascading Style Sheets) to separate the data layer from the display layer and write interactive effects in the javas Script programming language, such as filling in text, buttons, and responding to function buttons. The manager can edit the work list on the platform according to the requirements of the work management, assign it to the executive, and then query the task execution result and download through the platform. The manager platform can be linked to the MySQL Database Management System. Manager platform web page function (Figure 3). Enable and set, the administrator must obtain the account and password used by the management the platform and then l ink to

"http//icibiot.com/bms/login.php?refer=/bms/index.php" to be performed on each interface. Relevant authorization, editing, and functional operations are used.
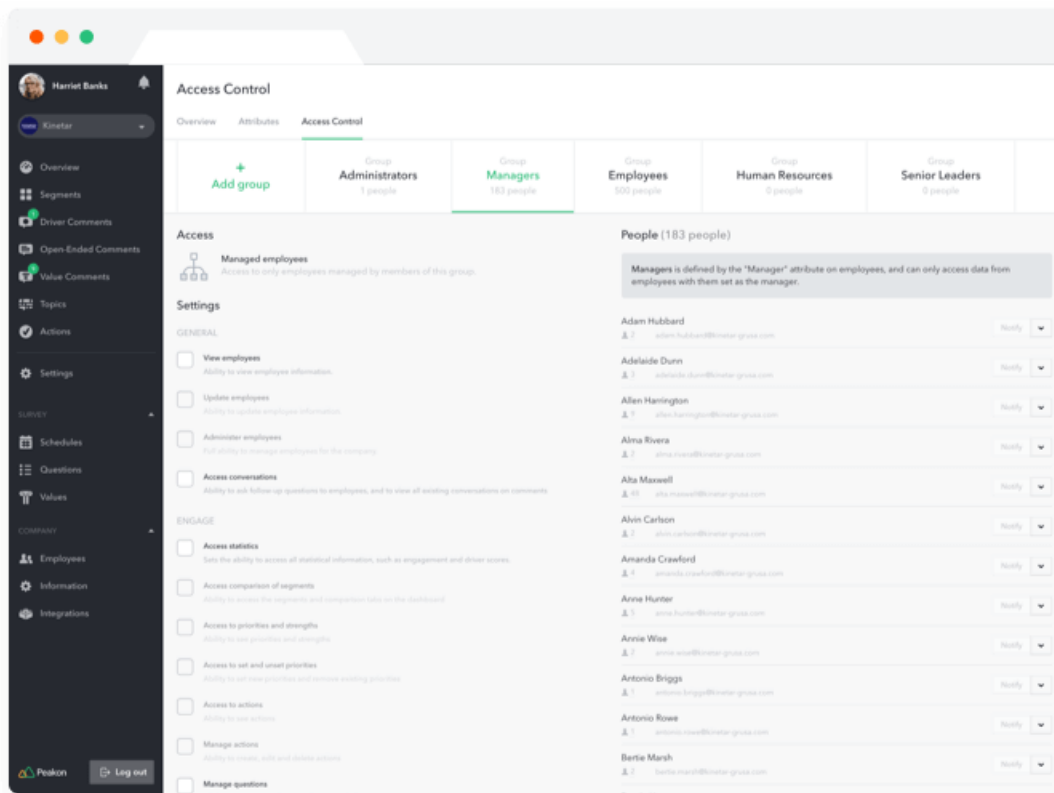
figure 3 BMS Cloud Workstation Management APP function

3.2. User interface

Since Apple's iOS and Google's Android are currently, the two most popular smartphone operating systems in the market, this study is about the user interface programming, using Apple's iOS, Google Android two systems. Both iOS and Android operating systems can be used after the AppStore search program and download, install and license. Therefore, the user can select any type of tablet or smartphone to operate the user interface.

The system user may be an engineering device personnel, a tester or a checker. The smartphone can receive a list of tasks assigned by the manager. The task execution classification can be selected by the pull-down function menu of the APP, and the execution result and the record data are executed. Pass to the cloud repository. The mobile app is developed by Apache Cordova and the front end of the application is the Angular

JS development architecture. The advantage is that as long as a set of APP executable files can be applied to various Mobile OS platforms, it can also be put on the market of each system. BMS Cloud Workstation Management APP function (Figure 4~6).
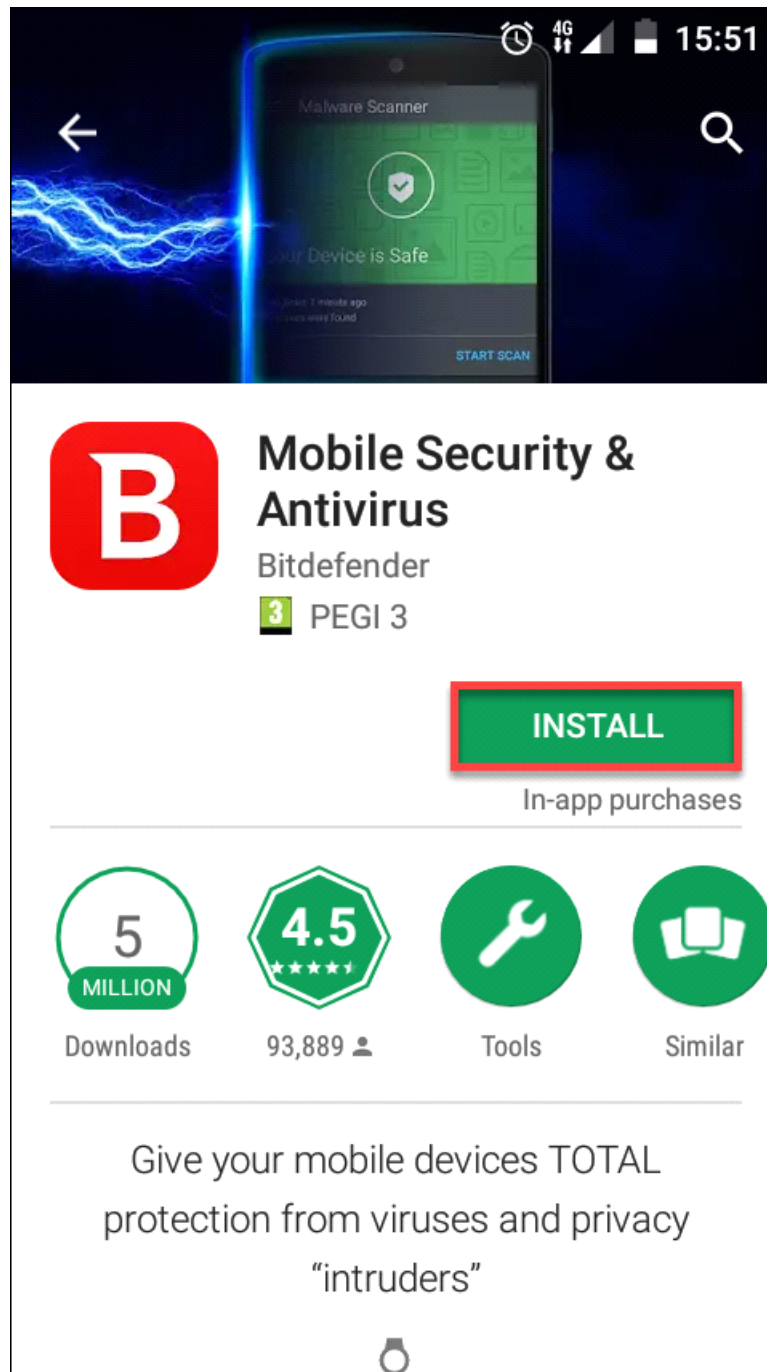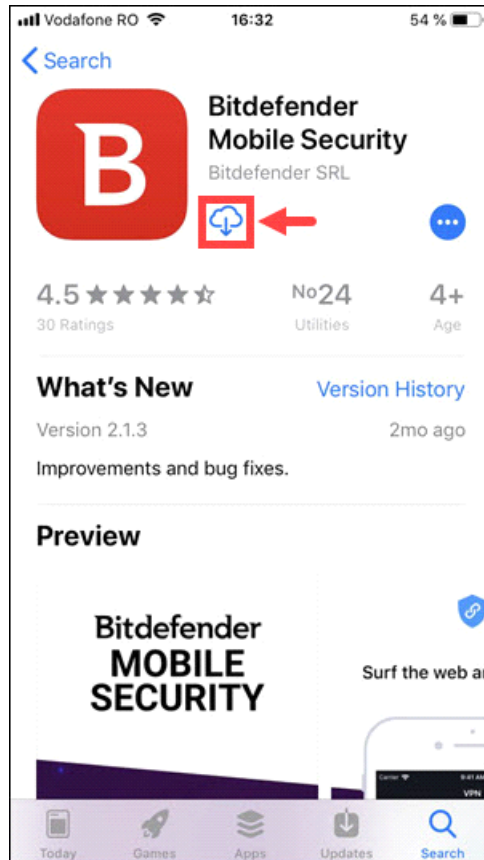

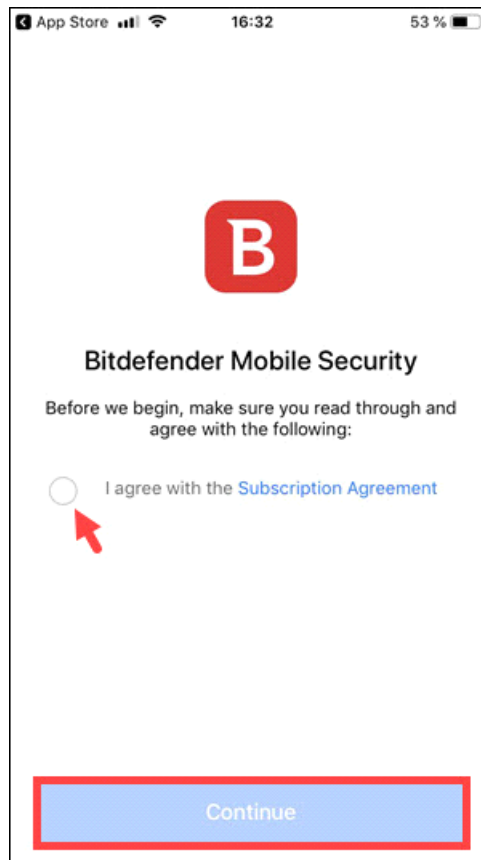figure 4 Google play search.

Figure.5 iTunes search.

figure 6 APP Install.

3.3. Cloud database

The National Institute of Standards and Technology (NIST) proposed that the cloud computing service model divides the cloud service model into four types: private cloud, community cloud, public cloud, and hybrid cloud. As the research is in the process of development, Provide systems for different construction management workers in the construction industry to experience the use and conduct investigations on post-use behavior. As far as the spirit of public works management is concerned, if managers can track the work results of task performers in time, it should be more conducive to the effectiveness of the above system experiences in site management, and more in line with the research motivation to promote implementation efficiency and management effec-

tiveness. Therefore, in the study of setting up the Database Management System (DBMS), this study chooses to adopt the public cloud method and informs the experiencer to upload the file of the cloud database, which will be deleted automatically within 7 days after uploading. In this way, not only can managers be prompted to download and archive files, but they can also develop the habit of regularly tracking and managing after dispatching tasks, and can also reduce the cost of building cloud databases. For enterprises or projects with high-security requirements, the public cloud model can be converted to the specified private cloud space by slightly adjusting the settings of the management platform and the user platform.

Cloud data inventory is taken from the Amazon Elastic Compute Cloud (Amazon EC2) cloud platform and is paired with Amazon Simple Storage Service (Amazon S3) access services. The operation interface uses two methods: web page and Cyber duck FTP program. The advantages of web pages are that they can be browsed, downloaded and deleted via any internet carrier; the Cyber duck program can be approved.

4. Conclusion

4.1 Results of the results

In the production process of the secondary development platform-BMS cloud construction management system, the experience, qualitative interview, and acceptance survey were conducted through the feedback mechanism of the competent authorities, professional bodies, corporate training courses, and public sharing sessions. Manage and dispatch the manager's platform of the task, the user interface of the task, and the cloud database of data storage and analysis, assist the users of the construction industry and solve the work management needs generated by different people, things, time, place, and materials. The post-use acceptance survey was conducted using the technology acceptance model. Among the 360 system users, 120 questionnaires were sent and 107 questionnaires were valid, with a recovery rate of 89.2%. The background conditions that are most concerned with the three research objectives of industrial qualifications, organizational type, and occupational category are observed by the results of the

average number of facets. First, most of the respondents in the industrial qualifications project believe that the system can not only effectively solve the problem. Different work management needs at the construction site; and, for different industry qualifications, the system is easy to operate.

In the future, the secondary development platform developed in the study will continue to operate as a "secondary development management platform". Through user interaction with the service group, users will continue to receive feedback from users and adjust and correct BMS. Cloud Construction Management System, I hope to provide more researchers or enterprises and use the secondary development platform production process of this research to develop more secondary development platform concept auxiliary tools.

4.2 Future prospects

This research aims at the construction industry and enhances the execution efficiency and management efficiency of different management types by establishing a secondary development platform. The goal is to enhance the competitiveness of the industry by addressing many management types. As far as different industrial types are concerned, there are many different types of management needs under their industrial characteristics. In summary, the establishment of a secondary development platform that can be re-developed by users to produce targeted and customized systems should be positive for the improvement of industrial competitiveness. Therefore, the Institute proposes a process for making a secondary development platform. According to the characteristics of different industries (such as the service industry, tourism, etc.), it can also create a secondary development platform that enhances the management type of the industry. It is easy to design, operate, The revised secondary development platform should assist in the improvement of efficiency and efficiency of different industries and enhance the competitiveness of the industry.

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