ENSURING QUALITY ASSURANCE BY USING CMC SYSTEM

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ABSTRACT: Quality assurance is a way of preventing mistakes or defects in manufactured products and avoiding problems when delivering solution or services to the customer. Quality, Specification and Standardization are most important aspects in the construction industry. This initiates from materials which we are using in the construction field. So it is very essential to check and verify the above said parameters for all materials. It takes some time for the professionals to verify the quality parameters of a particular material and its difficult to cross check with the IS code provision. The CMC system which means Construction Material Checking system is used for this purpose. The CMC system is develop by using Hypertext Pre-Processor (PHP) language concept. This quality system is not only useful for construction sector but also useful for the student community to know about the basic quality parameters.

Keywords: Quality, Specification, Standardization, CMC, Hypertext Pre-Processor (PHP) language.

INTRODUCTION

Quality, the word defines the standardization in the construction work. Quality is not only established in the final output, but also included in the raw materials which we are using in the construction work. Mostly the input materials to the construction work play a key role in ensuring the quality. Quality assurances for building materials are very essential in order to build strong durable and cost effective structure. Material testing is must in all the industries, particularly in construction sector. This is because an incorrect assessment of a material would ultimately be harmful to people and the environment. Building materials should be complying with the relevant standard. British Standard (BS), Indian Standards (IS), Japanese Industrial Standards (JIS), and American Society for Testing and Materials (ASTM) standards are used in different parts of the world. But in India, IS codes are accepted to ensure the quality of the materials. Each and every traditional materials having separate IS code books to ensure its standard. These books are published by Bureau of Indian Standard.

IS CODE AND ITS OBJECTIVES

During the pre independence period, standardization activity was sporadic and confined mainly to a few Government purchasing organization. The Indian Standards Institution (ISI) was, therefore, set up in 1947 as a registered society, under a Government of India resolution. The Indian Standards Institution gave the nation the standards it needed for nationalization, orderly industrial and commercial growth, quality production and competitive efficiency. However, in 1986 the government recognized the need for strengthening this National Standards Body due to fast changing socio-economic scenario and according it a statutory status. Thus came the Bureau of Indian Standards Act 1986 and on 1 April 1987, newly formed BIS took over staff assets, liabilities and functions of erstwhile ISI. Through this change over, the Government envisaged building of the climate

of quality culture and consciousness and greater participation of consumers in formulation and implementation of National Standards.

The following are the main objectives of Indian standards,

- To evolve a national strategy for according recognition to standards and integrating them with growth and development of production and exports.
- Harmonious development of standardization, marking and quality certificate
- To provide new thrust to standardization and quality control.

PURPOSE OF IS CODES

Indian standard codes have the following purposes,

- To protect public health and safety by setting a minimum standard of quality.
- Codes are to be followed and maintained, but are to be used as basic foundations for quality.
- Codes do not regulate building appearance, but do deal with issues of building performance.
- Codes do place limitations on design and aesthetics.

KEY IDEAS FROM LITERATURE

The following points are base for my research 90% said that construction materials are the most important factor which affects the quality of work.

- Trust with the material supplier plays a key role in ensuring the quality of the materials used in the construction work. This point highlighted that testing and checking are more important to confirm the quality.
- Standardization and changing the culture of construction industry plays a major role in assuring the quality in the construction.
- Cost of poor quality ranges from 15% to 40% of the business cost. Most of these defects are mainly due to materials and improper quality auditing system.

RESEARCH METHODOLOGY

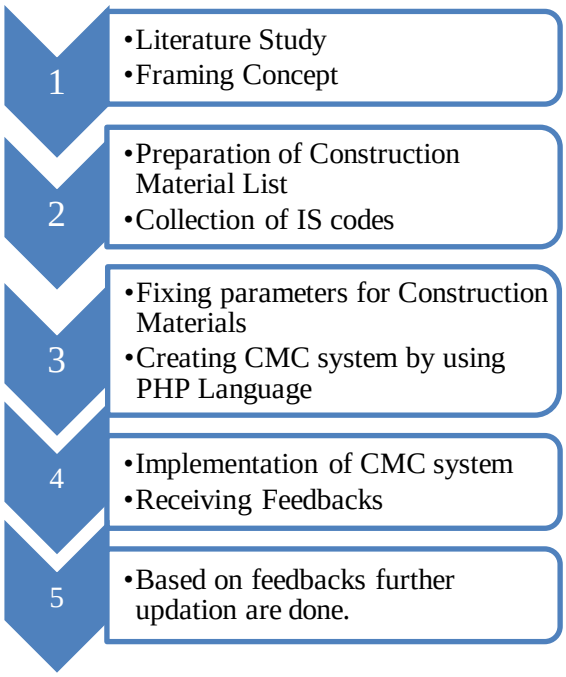
Scope

- Material plays a major role in construction industry, so material quality check plays a vital role in quality performance: quality checking is done easily by using this tool.
- Quality checking is mainly affected due to inadequate information, this difficulties is over looped with this tool.
- While materials are checks with this tool, ultimately it convinces the Indian Standard.
- Not only for organization and professionals but also use full for the educational institutions including students.

Objective

- Linking construction material, quality and IS codes.
- Creating a tool for checking the quality of construction material with reference to the Indian Standard (IS) codes which was published by Bureau of Indian Standard (BIS).
- Tool is created using PHP language which means Hypertext Pre-processor.

Processing Style



LINKING QUALITY, IS CODES & MATERIALS

Quality, IS codes and materials used in construction are most important aspects in improving the performance of the project. Once these three aspects are linked together ultimately there will be improvement in the cost and time of the project. Materials play a vital role in the construction project which will occupy 70% of the construction project cost and also basics for the quality. Once quality materials are used ultimately there will some assurance for the final output in terms of quality. These linking are done by using CMC system which means Construction Material Checking system. The demo Construction Material Checking (CMC) system screen shorts are fixed at the end.

DEVELOPING MODULE

Linking should be done through the Hypertext Pre-Processor (PHP) language but even though VB.NET and ASP.NET are available in the market. The main aim of choosing this PHP language is mainly due its benefits over other languages. PHP is a simple language and more creative in nature. It will supports in all types of operating systems which includes Windows, Linux, Mac OSX, UNIX. Cost involved with this language is low in associate with the future updates. And most important useful factor is easy to fix the problems identified in the final output. And finally working speed is higher when compared to the other language. So the benefits play a major role in choosing this language to create a tool.

PHP LANGUAGE

Linking of quality, IS codes and materials are done by using a PHP language. PHP (Hypertext Pre-processor) is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP code may be embedded into HTML code, or it can be used in combination with various Web template systems and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP code may also be executed with a command-line interface (CLI) and can be used to implement standalone graphical applications. The figure shows the working process of PHP language.

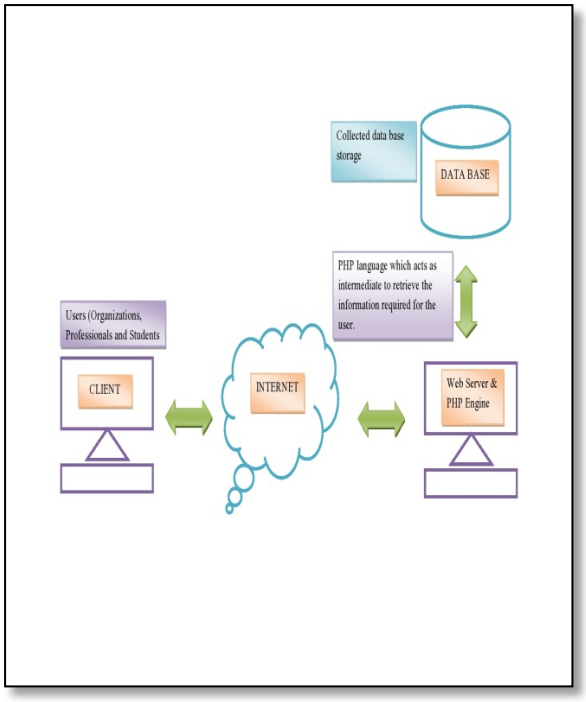


Fig-1 Working Process of PHP Language

DEMO MODULE

Before developing the complete module an initial demo work has been carried out. In this demo work a single material was taken and completely analysed with the reference to IS codes. All the possible quality parameters were analysed in depth and data are complied for the further process. For this demo work cement is chosen, because the most important material used in the construction industry. The cement is further classified in to 12 different types which have been used generally in the construction site. The module was initially created as a demo version in which only the single material data were inputted. The following images show the screen shots of CMC system.

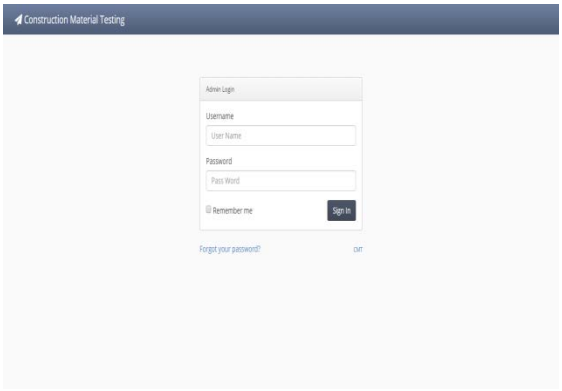


Fig 2- Login Screen for CMC System (Admin)

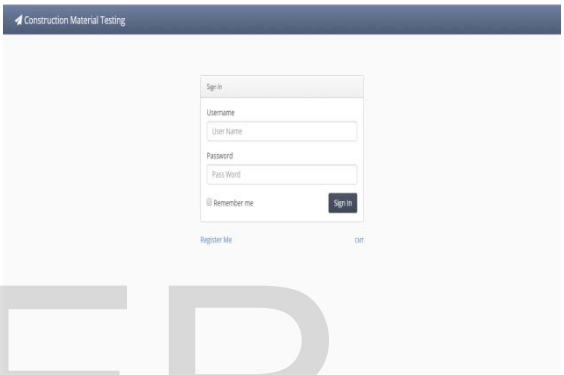


Fig 3- Login Screen for CMC System (Users)

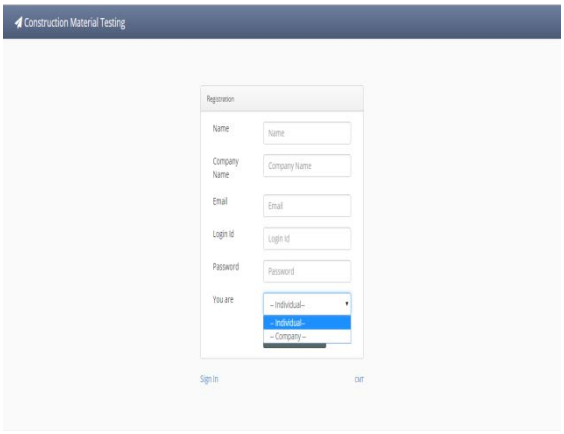


Fig 4- Registration Page for Users

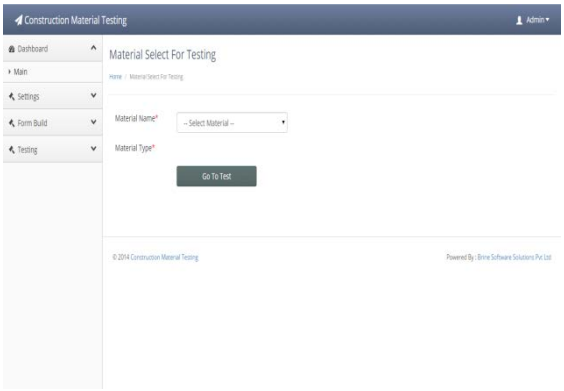


Fig 5- Selection of Material (Example-Cement)

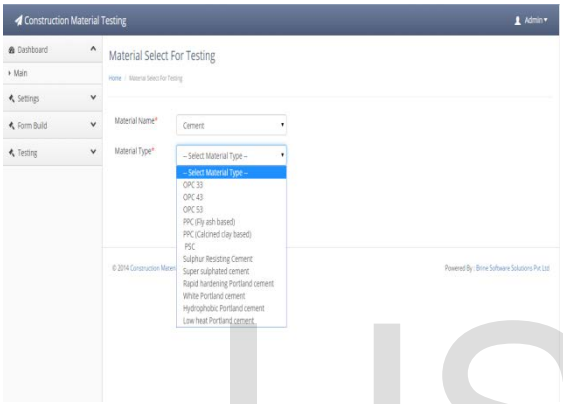


Fig 5- Selection of Material Type (Example-Cement OPC 43)

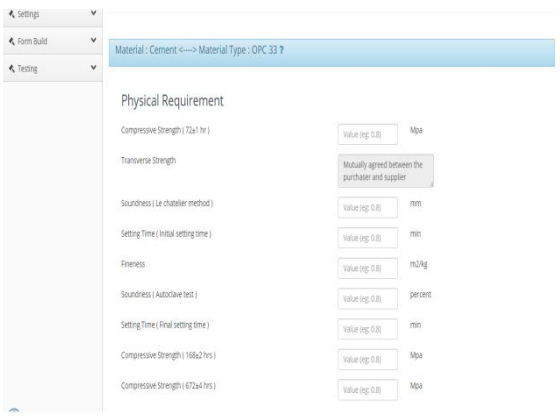


Fig 6- Entry form for Data (Example- Physical Requirements)

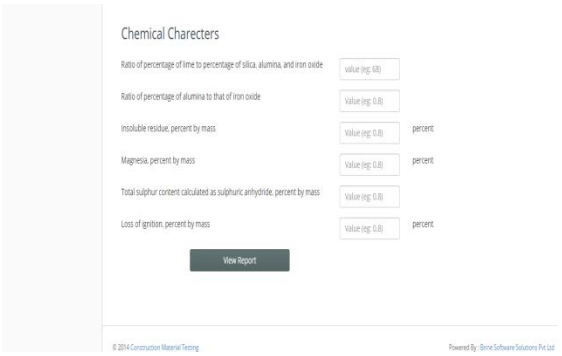


Fig 7- Entry form for Data (Example- Physical Requirements)

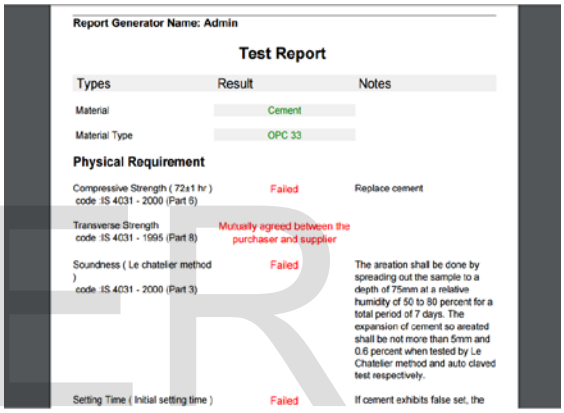


Fig 6- Final Report

CONCLUSION

Quality is a remarkable aspect in the construction industry, so everyone should have responsible to ensure the good quality of construction. Many professionals consider that, most of them following the same old method of systems for audits and quality system. It is more important to bring innovation in the quality system. It is not easy to bring innovation in all the direction of quality system, only stage by stage improvement only possible. So this CMC system is an initial development in the quality system to ensure the quality of the construction material. This Construction Material Checking (CMC) tool will be plays a better role in assuring the quality in the

construction. The developing of this tool is in progress and will be completed in short period of time. Finally this tool will undergone testing purposes to industries, professionals and also to the students communities. From this feedbacks will be welcomed and if any difficulties are found means it will be rectified as soon as possible and finally the tool will be launched. If any new materials are introduced in construction industry means it will be updated with in specific period of time. And this will be effectively useful in assuring the quality in construction industry.

REFERANCES

1. Abas. M, Khattak. S. B, Hussain. I, Maqsood. S and Ahmad. I. (2015), 'Evaluation of Factors affecting the Quality of Construction Projects', Technical Journal, Volume 20(SI) No.II(S), Page: 115 – 120.

2. Adenuga and Olumide Afolarin (2013), 'Factors Affecting Quality in the Delivery of Public Housing Projects in Lagos State, Nigeria' International Journal of Engineering and Technology, Vol.3, No.3, Page: 332 – 344.

3. Adnan Enshassi, Sherif Mohamed and Saleh Abushaban (2009), 'Factors affecting the Performance of Construction Projects in the Gaza Strip', Journal of Civil Engineering and Management, Vol.15(3), Page: 269 – 280.

4. Amin Rezaian (2011), 'Time-Cost-Quality-Risk of Construction Projects or Investment', Middle-East Journal of Scientific Research, Vol. 10(2), Page: 218 – 223.

5. Arazi Bin Idrus and Mahmoud Sodangi (2010), 'Framework for Evaluating Quality Performance of Contractors in Nigeria', International Journal of Civil & Environmental Engineering, Vol.10, No.01, Page: 31 – 36.

6. Arunmozhi. S, Suguna. K and Raghunath .P.N. (2015), 'A study on quality performance in building construction projects', International Journal of Engineering Science and Management, Vol. 5, Issue 1, Page: 31 – 36.

7. Jha. K.N. and Iyer. K.C. (2006), 'Critical Factors affecting Quality Performance in Construction Projects', Routledge Taylor & Francis Group, Total Quality Management, Vol.17, No.9, Page: 1155 – 1170.

8. Lakshmi. R (2015), 'Quality Control and Quality Assurance in Building Construction', National conference on Research Advance in Communication, Computation, Electrical science and Structures, ISSN: 2348-8352, Page: 29 – 37.

9. Peter Hoonakker, Pascale Carayon and Todd Loushine (2010), 'Barriers and benefits of quality management in the construction industry: An empirical study', Routledge Taylor & Francis Group, Vol.20, No.9, Page: 953 – 969.

10. Phatak. U. J., Mr. Amit A. Mahadik, Mr. Prasad R. Kashid, Miss. Reshma U. Bhoir and Miss. Neha R. Manwatkar. (2014), 'Necessity of Quality Control in Construction Industry', Indian Journal of Research, Volume: 3, Issue: 4, Page: 106 - 107.

11. Sailaja. A, Basak. P.C. and Viswanadhan. K.G. (2015), 'Hidden cost of Quality: Measurement & Analysis', International Journal of Managing Value and Supply Chains, Vol.6, No.2, Page: 13 – 25.

12. Sang-Hoon Song and Hyun-Soo Lee (2004), Analysis and Utilization of Quality cost in Construction projects', Seoul National University, Korea.

13. Tan Chin-Keng, Abdul-Rahman and Hamzah (2011), 'Stability of Quality Management in Construction Projects', Chinese Business Review, Vol. 10, No.7, Page: 542 - 552.

14. Vishal Vasant Waje and Vishal Patil (2012), 'Cost of poor Quality in Construction', ISOR Journal of Mechanical and Civil Engineering, ISSN: 2278-1684, Page: 16 – 22.

15. Zhi Gao, Jinfu Ye and Yi Huang (2012), 'Study on the Construction of Enterprise Quality Culture for Brand Strategy', Scientific Research, Vol.4, Page: 260 – 264.