

# Construction Artisan Inspection Android Application Using Olap (On-Line Analytical Processing) Cluster Algorithm

Aseema Parveen Az, Haripriya A, Rajeshwari C, Mrs.S.Yamuna,

*Dept. of Computer Science and Engineering, Meenakshi Sundararajan Engineering College, Chennai*

*Dept. of Computer Science and Engineering, Meenakshi Sundararajan Engineering College, Chennai*

*Dept. of Computer Science and Engineering, Meenakshi Sundararajan Engineering College, Chennai*

*Professor, Dept. of Computer Science and Engineering, Meenakshi Sundararajan Engineering College, Chennai*

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**ABSTRACT:** General contractors play an important role in the success of construction projects. Determining the most appropriate contractor for a construction project is a highly critical issue. Selecting the right contractor for the right job can significantly influence the overall project performance. Traditional selection process like bidding will lead to inappropriate selections. Therefore we propose an Android application for the user to find the contractor who can satisfy the budget constraints as well as other criteria. Top ranked contractor will be recommended to the user using data mining concepts. Offloading technique is done to store the user database and contractor database in the cloud database. OLAP(On-Line Analytical Processing) Cluster Algorithm is used for recommending the contractor in the ranking manner. Feedback from the user is also collected in this android application by ranking process. So that it will be useful in the future recommendation for the user to find his most suitable contractor who can satisfy the user with budget constraints and his other criteria.

**Keywords:** datamining, bigdata, OnlineAnalyticalClusterAlgorithm (OLAP), user, builder.

## I. INTRODUCTION

A budget constraint refers to all the combination of goods and services that can be purchased by a consumer with his or her income at their given prices. The concepts of a preference map and a budget constraint is used by the consumer theory for analyzing consumer choices. Consumer behavior is considered a maximization problem, which means that a consumer utilizes the most of his limited resources for maximizing his utility. Budget is the only thing that limits the

consumption of a consumer as the demand of consumer is insatiable and with quantity the utility function grows. An individual consumer should make the choice of consuming goods at the point in which the indifference curve which is most preferred on the preference map is tangent to the budget constraint. It means that the tangency of the indifference curve to the budget constraint shows the maximum utility that can be obtained by making use of the consumer's entire budget.

The point of tangency represents the combination of goods a consumer should purchase in order to utilize the budget fully to get maximum utility. A line that joins all tangent points between the indifference curve and budget constraint is known as expansion path.

## II RELATED WORKS

### A . ANDROID

Android is a mobile operating system (OS) based on the Linux kernel and currently developed by Google. With a user interface based on direct manipulation, Android is designed primarily for touchscreen mobile devices such as smartphones and tablet computers, with specialized user interfaces for televisions (Android TV), cars (Android Auto), and wrist watches (Android Wear). The OS uses touch inputs that loosely correspond to real-world actions, like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects and a virtual keyboard. Despite being primarily designed for touchscreen input, it also has been used in game consoles, digital cameras, and other electronics.

### B.DATA MINING

Data mining is a process used by companies to turn raw data into useful information. By using software to look for patterns in large

batches of data, businesses can learn more about their customers to develop more effective marketing strategies, increase sales and decrease costs. Data mining depends on effective, data collection, warehousing, and computer processing.

### III. LITERATURE SURVEY

**Gokhan Arslan, Taylor, Francis(2012)Web-based contractor evaluation system for mass-housing projects in Turkey.In : Journal of Civil Engineering and Management.**

The main objective of developing WEB-CONTEST is to facilitate the General contractors selection process in construction projects of Public Housing Development Administration. In addition, it aims to minimize the problems that may occur in traditional selection processes. The aim of this survey is to examine the relative weights of the criteria that have been using by this owner in the construction contractor selection process. Then, a web-based contractor evaluation system called WEB-CONTEST by which the contractors can be evaluated based on a combined criterion is presented.

Using this system, the construction owner can select the most appropriate General contractors for the relevant projects, speed up the selection process and gain the advantage of saving time and cost during the bidding process.

In this method, the lowest level of criteria in the hierarchy is named as attributes instead of sub-criteria. Decision-makers are asked to rank each of the attributes, assigning the first ranked attribute to a score of 100 and the others a value between 0 and 100 depicting their ranked relationships Then the performance values with relative weights for all attributes are determined and a utility value for each alternative is calculated.

**M. C. B. Araújo, L. H. Alencar, C. M. M. Mota,Contractor Selection in Construction Industry: A Multicriteria Model.In : Proceedings of the 2015 IEEE IEEM**

Contractor selection is a strategic question for the construction industry since the suppliers have an important role in projects performance. Two essential issues in this process are the choice of adequate criteria and methods of supplier's evaluation. Therefore, this paper applies a model for contractor selection in the construction industry. Normally, this selection is considering a group decision problem, since various departments are influenced for this choice and its managers participate of the process. Moreover, this paper focuses on the situation in which the company wants to select a set of contractors, maximizing the

use of resources according with the constraints imposed. In this context, the model utilized considers the interaction between a Group Decision and an Integer Programming methods. Afterward, it was made a numerical application of the model. The criteria used in this simulation were identified from a literature review in papers related to the supplier's selection in the construction industry.

**R. M. Melo<sup>1</sup> , D. D. Medeiros<sup>2</sup> , A. T. de Almeida<sup>2</sup>,Selection and Ranking of Improvement Approaches in Construction Companies: SMARTS MethodIn : proceedings of 2011 IEEE IEEM**

There are various ways, related to quality methods, tools and standards, to improve production processes. The aim of this paper is to present a multicriteria decision model for selecting and ranking these alternatives taking into account Quality, Environment and Sustainability, and Safety. The paper proposes a multicriteria decision model based in SMARTS (Simple Multi-attribute RatingTechnique) method. A study case in the context of construction companies illustrates the use of the model. The definition of the criteria and their evaluation was conducted based on interviews with experts in construction companies. One of the differentials of this model is the structure designed for a quality program planning decision making.Also, it lays on its use of an alternative set of fragmented improvements. These alternatives were combined together with some restrictions so that they became a new global set of alternatives.

The extensive research on quality management (QM) indicates that the ultimate goal of QM is to establish a management system and an organizational culture that ensures customer satisfaction and continuous improvement. Thus, the objective of this study is to build a model that facilitates the choice and sequencing of implementing improvement alternatives directed to Quality, Safety, Sustainability and Rationalization in construction companies. Thereafter, modeling was performed using a Multi criteria Decision Support approach. Two applications were conducted with two decision-makers to illustrate the use of the model. The first is the director of the construction company A and the second is a project manager for construction company C. These two applications were performed using SMARTS.

**Sowndarya Sundar\_, Jaya Prakash Champatiy, and Ben Liang Multi-user Task Offloading to HeterogeneousProcessors with Communication Delayand Budget Constraints**

Task scheduling and offloading in a cloud computing system with multiple users where tasks

have different processing times, release times, communication times, and weights. Each user may schedule a task locally or offload it to a shared cloud with heterogeneous processors by paying a price for the resource usage. We consider four different models in this paper:

- (i) zero task release and communication times,
- (ii) non-zero task release times and zero communication times,
- (iii) non-zero task release times and fixed communication times,
- (iv) non-zero task release times and sequence-dependent communication times.

Our work aims at identifying a task scheduling decision that minimizes the weighted sum completion time of all tasks, while satisfying the users' budget constraints. We propose an efficient solution framework for this NP-hard problem. As a first step, we use a relaxation and a rounding technique to obtain an integer solution that is a constant factor approximation to the minimum weighted sum completion time. This solution violates the budget constraints, but the average budget violation decreases as the number of users increases. Thus, we develop a scalable algorithm termed Single-Task Unload for Budget Resolution (STUBR), which resolves budget violations and orders the tasks to obtain robust solutions. We prove performance bounds for the rounded solution as well as for the budget-resolved solution, for all four models considered. Via extensive trace-driven simulation for both chess and compute-intensive applications, we observe that STUBR exhibits robust performance under practical scenarios and outperforms existing alternatives. We also use simulation to study the scalability of STUBR algorithm as the number of tasks and the number of users in the system increases.

**Tong Liu<sup>1</sup>, Anuradha Mathrani<sup>1</sup>, Jasper Mbachu<sup>2</sup>, Hunting the Popular Construction Apps, In : proceedings of 2016 3rd Asia-Pacific World Congress on Computer Science and Engineering**

Mobile computing offers several benefits which could help construction workers improve efficiency and productivity. However, the uptake of the technology is quite low in the industry, with little research on key constraint factors and the priority needs of the construction workforce. This study aimed to achieve three key objectives:

1) to identify the smartphone operating systems used by construction workers;

2) to identify barriers to greater uptake of mobile app technology in New Zealand Construction Industry;

3) to determine the popularity of construction apps and their key features. Through interview-based exploratory survey method, feedback received from members of the Registered Master Builders Association of New Zealand was analyzed using content analysis and descriptive statistics methods. Six factors were found to constrain the uptake of mobile apps in the industry, the most influential being cost of software and licensing. Findings in relation to the popular apps and their key features showed that PlanGrid – a cloud-based project collaboration and management system – was the most popular with a rating of 5/5. Others included JobFlex – an estimating and tendering software, Procore – used for project management, and SmartBidNet used for bid management. The findings could help app developers understand the specific needs of construction workers, and improve wider uptake of mobile apps in the industry.

**Pollaphat Nitithamyong, Mirosław J. Skibniewski (2004), Web-based construction project management systems: how to make them successful?, In : Automation in Construction**

This paper describes research conducted at Purdue University on the identification of factors determining success or failure of web-based construction project management systems, particularly through the use of application service providers utilized by construction firms without in-house expertise to develop such systems for exclusive company use. The construction industry is fragmented due to the many stakeholders and phases involved in a construction project. This fragmentation has led to well-documented problems with communication and information processing and has contributed to the proliferation of adversarial relationships between the parties to a project. This fragmentation is also often seen as one of the major contributors to low productivity in construction. Information Technology (IT) is now routinely used in the construction industry as a tool to reduce some of the problems generated by fragmentation. The use of IT improves coordination and collaboration between firms participating in a construction project, leading to better communication practices.

Its benefits include an increase in the quality of documents and the speed of the work, better financial control and communications, and simpler and faster access to common data as well

as a decrease in documentation errors. IT spending in Architecture / Engineering / Construction (A/E/C) firms has increased significantly during the past few years, indicating that A/E/C firms are increasing their interests in IT applications to facilitate construction projects.

#### IV. PROPOSED SYSTEM

In the existing system, we have seen out online banking via personal computers and mobile apps on cell phones has made banking more convenient and accessible 24 hours a day. More preparation is necessary for the early stages of design. The architect is likely to be more restricted in his method of working. The designers may have some limitation in their work style. The owner has the sole power to decide what type of contract & delivery method should be used for a specific facility to be constructed and to set forth the terms in a contractual agreement. And as a principle to manage the project effectively we should first manage the contracts. While construction contracts serves as a means of pricing construction, they also structure the allocation of risk to the various parties involved. Critics say that the lack of competitive bidding by the design build process points to its greatest flaw in serving the interest of the client. By the mere fact of the design build method contracting with a single source appointment, by default eliminates the traditional competitive bidding component from the process. The nature of the design build method is a best value approach instead of a competitive bid solicitation approach. Owners face the same sacrifice decisions in the design-bid-build method, although at a greater expense when plans are completed before they discover these factors.

- It will handle with single source responsibility.
- Reduced cost and time Savings.
- Builders have maintained optimum project efficiency.
- User can know the value of builders depends upon the specification.
- Greater Owner Project Control.

#### V. MODULES DESCRIPTION

##### CHECKING INTERNET CONNECTIVITY

First, check that mobile data is turned on and you have a data connection. Open your Settings app "Wireless and Networks" or "Connections" Mobile data or Cellular data. On some devices, you may need to select "Data usage" before you see this. Turn mobile data on.

#### AUTHENTICATION AND AUTHORIZATION

##### • Authentication

Authentication is the process of determining whether someone or something is, in fact, who or what it declares itself to be. Authentication technology provides access control for systems by checking to see if a user's credentials match the credentials in a database of authorized users or in a data authentication server.

Users are usually identified with a user ID, and authentication is accomplished when the user provides a credential, for example, a password, that matches that user ID. Most users are most familiar with using a password, which, as a piece of information that should be known only to the user, is called a knowledge authentication factor.

##### • Authorization

Authorization is the process of giving someone permission to do or have something. In multi-user computer systems, a system administrator defines for the system which users are allowed access to the system and what privileges of use (such as access to which file directories, hours of access, amount of allocated storage space, and so forth).

Assuming that someone has logged in to a computer operating system or application, the system or application may want to identify what resources the user can be given during this session. Thus, authorization is sometimes seen as both the preliminary setting up of permissions by a system administrator and the actual checking of the permission values that have been set up when a user is getting access.

#### ADMIN

Admin can view all the user and user details they only have access to have seen the details. They will maintain the overall data with the most secure and immediate response will be passing to the end-users. They have to analyze the product confirmation once the user is given a request for the sale.

#### USER

The modules provide the user details. If the user new to the application means they want to register to this application after they can access this application easily. The user can register the details with proper validation and all the fields will be required for the registration process. Users can see the builders as per their requirements and it will be make more useful for the builders selection. They can see about builders details with the complete specification as per the user needs and they can

choose the builders and give the request for construction with the full details about its specification. Users can edit the profile with proper validation and they can update the profile then email id and name will be constant. They can see the order list, order status for their reference after that they will give feedback about the product as well as application.

#### **BUILDERS**

The modules provide the builder details. If the user new to the application means they want to register to this application after they can access this application easily. The user can register the details with proper validation and all the fields will be required for the registration process. Builders can add the design and their specification of budgets constraints for the user reference. Builders can edit the profile with proper validation and they can update the profile then email id and name will be constant. They can see the request list, construction status for their reference after that they will give status about the construction to the respective users for their reference.

#### **BUDGET CONSTRAINTS**

These modules provide information about the Budget constraints details for the individually users. Even before you enter the planning phase, address areas where your project could face changes at any point in the process. Since many project managers out there attribute their going over-budget to changes that occur along the way, hash out some potential scenarios first. The user can see the budget according to their user specification it get compare with all the builders.

#### **RANKING RANGE**

These modules provide the builders ranking information with the full specification of the projects. The builders ranking will be evaluated with rate, place, experience, specifications and projects. So the user can easily preferred the

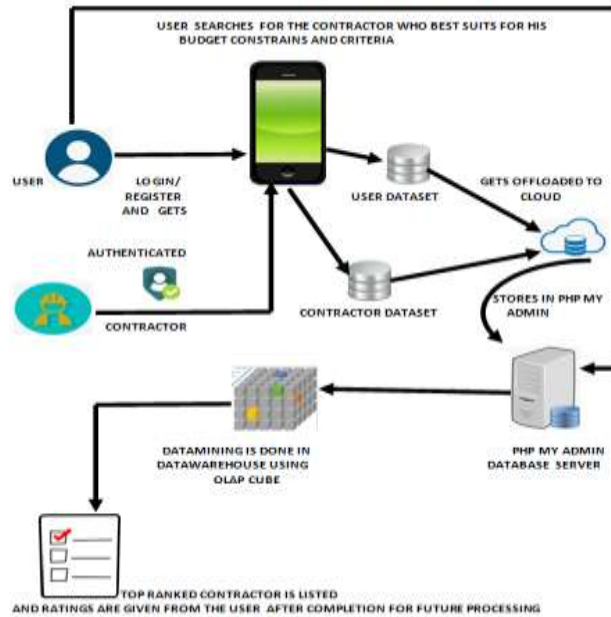
builders with the following details and it will be shown in the first its makes decision for user easily and it will be get clearance about builders value.

#### **STORAGE**

This module gives the information about the storage for the entire application. It will be get secured and maintained by the admin. Because nowadays in the current world data loss is happened frequently through the location or email id. So we secured the data with high credential and it makes more security levels for the user details. The data storage will have happened with split up and no chance for the data traffic also it will get a response immediately.

### **VI. SYSTEM ARCHITECTURE**

This model of android application is used to find the most suitable contractor who will be able to satisfy the budget constraints of the user. In this Architecture diagram we understand that the user and the contractor will have separate login credentials, and they can also register accordingly. When the user and contractor registers the dataset of the user which consists of the budget constraints and the details of the user are gets offloaded to cloud database. Similarly, the details of the contractors are also gets offloaded to the cloud database. These databases are stored in phpmyadmin server and the admin also has the separate login to view the status of the application uses. When the user request and search for the builders who can satisfy the budget constraints the request will send to the phpmyadmin server. Then datamining is done in the datawarehouse using OLAP (Online Analytical Processing) Cluster Algorithms the top ranked and low budget builders are listed accordingly. After completion of the project, the user can rank the contractor for future processing.



## VII. SYSTEM IMPLEMENTATION

In the system construction we used java as front end , backend as mysql and servers as php .It has 3 module that is user,builder and admin .In user first he/she want to register themselves by creating new account after that login can be done . In user login we can see the builders details and can edit the details and also see the status of builders

.In builders login he can login and add the design architecture in how many day he would complete the project .In admin login we can see

both the user login and builder login all these information are stored in the database .It will retrieve and give the information when it is required.

### A CREATE USER ACCOUNT

In user first he/she want to register themselves by creating new account after that login can be done . In user login we can see the builders details and can edit the details and also see the status of builders.



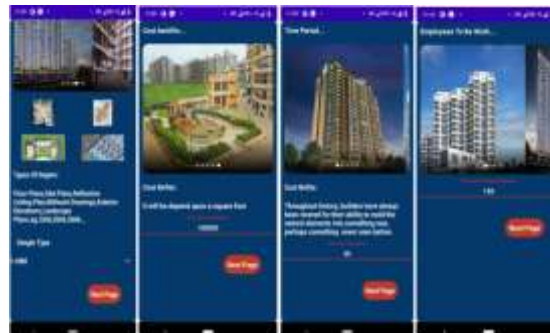
### B .CREATE BUILDER ACCOUNT

In builders login he can login and add the design architecture in how many day he would complete the project with the help of how many

workers , how many days ,how much sq ft and also he can Update the status to the user about the completion work.



USER SEARCH PAGE:



## VIII. CONCLUSION AND FUTURE WORK

In this application, we have multi-user computational offloading problem, for a system consisting of a finite-capacity cloud with heterogeneous processors. The offloaded tasks incur monetary cost for the cloud resource usage and each user has a budget constraint. We have formulated the problem of weighted-sum completion-time minimization subject to the user budget constraints. We have formulated a problem to minimize the weighted sum completion time subject to the user budget constraints. The proposed algorithm relaxes, rounds, and resolves budget violations, and it sorts the tasks to obtain an effective solution. We have also obtained interesting performance bounds for both the underlying rounded solution and the budget-resolved solution for different release-time and communication-time models. Through simulation using realworld application traces, we have observed by scalable and substantially outperform

the existing alternatives especially for larger systems. A possible future research direction is to account for explicit task dependencies in the formulation. Additionally, the consideration of multiple types of computing resource in task scheduling is a challenging but important problem and additionally, we may consider different pricing and budget schemes as an extension to the linear scheme considered in this application with the better user interface and feels free to users.

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