

# Solving Human Resources Management Of Construction Labors Using Mobile Community Network

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**Abstract**—A construction labor works on a project based on a determined interval time. If the construction project is done then the labor has to find another one. Based on the interviews conducted to some construction labors in Banda Aceh and Medan, they depend totally on the networking and friendship among the labors in finding a project. sOn the other hand, the labors can survive only for seven days if he is not working. The proposed solution is developing a job search system for the construction labors using mobile application. This system is built using JavaME, Record Management Store (RMS) as the storage media, and Short Message Service (SMS) as the data connection. This system applies distributed system thus it will not cause the process becomes slow because the limited memory of the cellular phone. This system provides the construction labors specification which is needed by the employer and the list of construction labor specification. Job searching will be processed again once the labors done with a project. In this way, the construction labors will continually contracted with a project. Using this system will solve the problem faced by the construction labor in finding a project and finally achieve their ekonomis growth.

**Keyword:** labor, project, MIDlet, cellular phone, SMS.

## I. INTRODUCTION

Indonesia as a developing country is actively working on development everywhere. One positive effect of this development is opening a job opportunity especially for the construction labor. As it does not require high education nor skill, construction profession is one among the alternative being chosen by some people in Indonesia to support their lives.

The payment of the construction labor is calculated per day. The payment system could be daily, weekly, or monthly depends on the head of the project that hires them. A construction labor works on a construction project in a particular period. If the work is done then they have to find another project. Based on the interviews and survey conducted to some of the construction labors in Nanggroe Aceh Darussalam Province and Medan, they are able to survive if not working approximately only for seven days. Meanwhile they have to find another project otherwise it will harm their economics and the family live. They will be unable to fulfill their needs, such as food and their children school fee. Consequently this problem will raise the list of parent that unable to fund their children for formal

education. Ironically, on the same time out there a head of the project has difficulty in looking for a construction labor to work on is project. To solve both of these problems faced by the head of the project and the labor, tis paper proposed a mechanism that can provide information for both parties. The writer suggests this issue as there are many low educated labors in Indonesia.

## II. BACKGROUND

Based on the interviews conducted to some labors in Nanggroe Aceh Darussalam Province and Medan, in finding of a project the labors depend on the networking friendship among the construction labor. Thus, the information spreads out verbally. In sharing information, besides seeing face to face, they also use cellular phone. Cellular phone is a media for them to get information about an offered job. Nowadays, because of the competition among the cellular operator and the improvement on electronic device inventions, the cellular phone is not an expensive gadget anymore; almost all of the labors own it.

Some of problems rise in verbal information sharing as follow:

- It does not guarantee the labor to get the job continuously because it is unsure that the information will always reach all the labor.
- The labor might not get the job that fits to their skill specification, for example a labor that has installing roof specification has to do the tile installation in order to keep himself working.
- Sometimes the labor does not get the information directly from the head of the project, thus there is a misinformed in the amount of the payment.
- The head of the project is difficult in looking for the labor based on the labor's skill that make him hire any labor which consequently decreases the quality.
- As the information is not directly flow from the head of the project to the labor, one bad person can take advantage from this situation by not giving correct information such as the

information of the payment amount could be lower than that of offered by the head of the project.

- The payment is not transparent because it is not written in the legal contract.
- The propotion of job distribution to the labor is not even because one might get more information about provided job than others.

If only there is a system that search job for the labors continually related to their skill specification, for sure it will excel all the above problems. This paper purposes an idea proposed of a job searching system for the construction labor community using cellular phone application. Cellular phone is a chosen media considering that it is a familiar telecommunication device for the labor. The connection used here is Short Message Service (SMS) that is available in all cellular operators in Indonesia.

### III. PROPOSED METHOD

The technology applied for this system as follow:

#### A. Java Micro Edition (Java ME)

Java ME is one of the Java programming version designed particularly for devices that have limited memory, layout, and process like cellular phone, PDA, and other embedded devices such as TV set-top boxes, and printers [1]. The application using Java ME is called MIDlet (Mobile Information Device Application).

#### B. Record Mangement Store (RMS)

RMS is a data storage device on MIDlet (Mobile Information Device Application). Record Store is a class that handles a set of record and all the access to the record. Record Store is a concrete class in a javax.microedition.rms packet. Each Record Store has unique name to diffentiate it from the other Record Store. The storage capacity at each cellular phone is not the same and various. Each MIDlet that uses RMS has to specify the minimum of the total storage used by JAR (Java Archive) manifest and application descriptor.

#### C. Short Message Service (SMS)

In Indonesia, eventhough it is more expensive than the GPRS connection, SMS is being used more often because this feature is available even in the remote area where the BTS (Base Transceiver Station) of GSM and CDMA operator exists with only SMS and call service. SMS is a feature that is provided by any cellular phone version included an old one.

The setting of transmitting and receiving of SMS in JME is done by a Wireless Messaging API packet. Class in this packet is stored in javax.wireless.messaging packet. Basically the pith of the WMA packet exists on the interface MessageConnection.

Java ME allows the transmitting and receiving of SMS using certain port. This port incurs the message not being sent to the SMS inbox but to the MIDlet of the SMS receiver device.

#### D. Push Registry

Push Registry enables MIDlet to register the connection entering the Application Management Software (AMS). If the program is not working then the AMS will listen to the connection at the registered address in the application. Almost all the connection type is supported, included ServerSocket and MessageConnection.

Following are the design of the system:

#### A. General description of the system

This system is built using JavaME language and Record Management Store (RMS) as the storage media. The users of this application system consist of construction labor and the head of the project. The media is the cellular phone. The application is divided into two parts, MIDlet of the construction labor for the application installed to the labor's cellular phone and the MIDlet of the project head for the application installed on the head of the project cellular phone. The labor MIDlet contains the labor data that seeking for a job, while the project head MIDlet contains specification data of required labor needed by the head of the project.

Both MIDlets will interact to each other by sharing information so that the labor gets information about construction work and the head project gets the information about the labor to be hired (Figure 1).

#### B. System Requirements

The objective of the system is to find a job for the labor that fits his specification and search a construction labor that suits to the specification given by the head of the project. The requirement of the system is the system has to be able to run on a cellular phone with limited capacity. Furthermore, considering the user of the system is the labor with low income, the system has to run on an ordinary cellular phone that supporting Java and not an expensive advanced smartphone. The connection among the community must be supported by all cellular phones and operators in Indonesia. To fulfill these requirements, this paper proposes a distributed system with connection using Short Message Service (SMS).

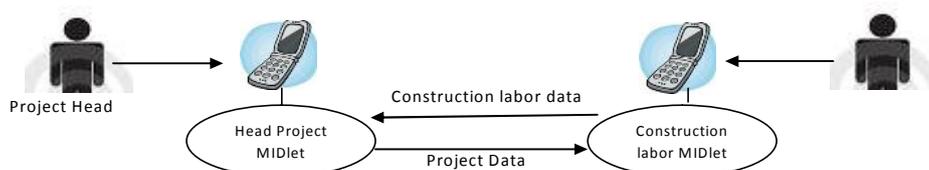


Figure 1. General description of the system

C. Distributed System

To avoid a big and heavy application, we can implement a distributed system. A distributed system is a set of independent system that visible to the user as a coherent system (Andrew S. Tanenbaum 2002). With distributed system each MIDlet on the labor cellular phone and the head project cellular phone are still working without depending on the whole of the system. When the member’s cellular phone is broken or offline, the system still runs. On practice, this system is a distributed MIDlet access, though data at each system MIDlet separated physically but they are connected logically in a network. Thus data on each MIDlet can be manipulated according to the user request (Figure 2).

D. SMS as Data Connection

SMS is used as the communication media between the MIDlets considering some reasons, which are: SMS is a feature that provided by all cellular operator and all type of cellular phone even the old version one, SMS is affordable in all region in Indonesia. In this application, SMS is used to connect one MIDlet with another to allow the information sharing without being noticed by the user. The SMS transmitted from one MIDlet to other MIDlet through a certain port that ensure the SMS will not entering the SMS inbox but to the certain port. By receiving the SMS through the push registry, MIDlet will activate. Then the requesting data will be sent back to the SMS sender. Finally MIDlet will display the result to the user.

E. The system process

Each MIDlet only saves data that belongs to itself. Construction labor MIDlet only saves data of the labor specification which are:

- Labor ID
- Name
- Address
- Skill
- Status ( employed / unemployed )

Whereas the MIDlet for the head project only saves the required labor data as follow:

- Project location
- Labor skill needed
- Payment per day
- Working date
- Number of labor needed

Following are the scenarios of how the system works:

1. Each Head project will fill the colom of the required labor.
2. MIDlet head project automatically will send required labor data to all construction labor MIDlets.
3. Construction labor MIDlet will compare data in the incoming data with the data in the recordstore. The construction labor MIDlet will compare data only with the labor data that is not currently working
4. If data is appropriate then construction labor MIDlet automatically will send ID data of the labor to the head project MIDlet.
5. Head project MIDlet will check if the job is still available, because there is possibilty that the job has been taken by other labor MIDlet. If it is available, then the MIDlet will save the labor data based on the the labor ID that is sent to the recorstore in the head project cellular phone. The number of labor needed in this specification will lessen automatically as the vacancy filled up with this labor data.
6. Then the head project MIDlet sends SMS to the labor inbox to notify the information about the job which includes the job location, head project’s name, starting date, and the payment per day. On the same time the labor MIDlet will set his status from unemployed to employed.
7. This process will continually occur until all required data having by the head project filled up.

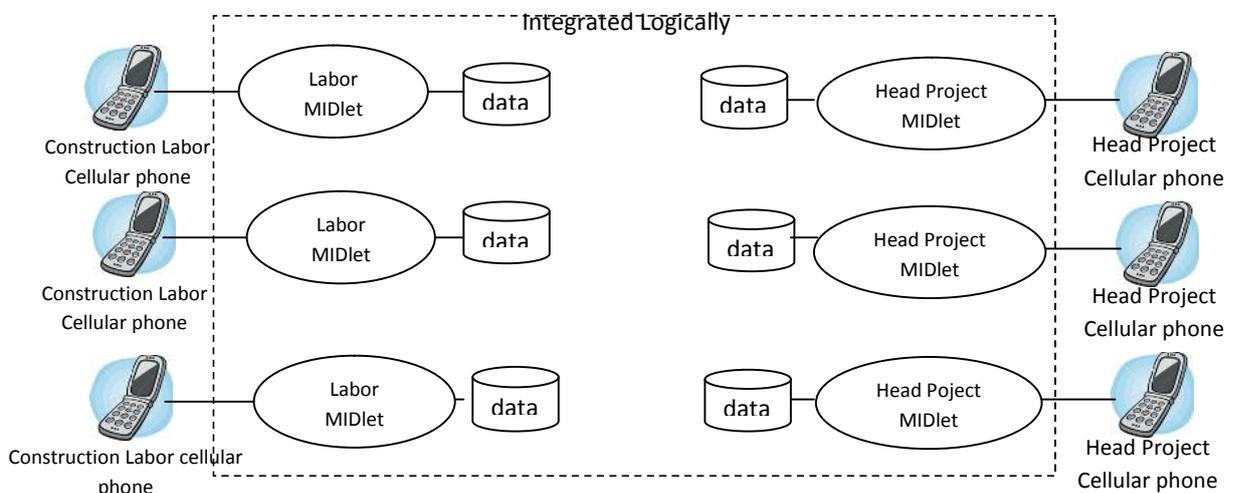


Figure 2. System with distributed MIDlet

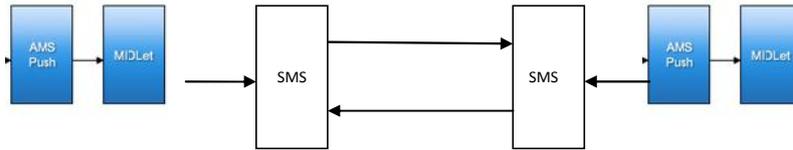


Figure 3. SMS to activate Push Registry

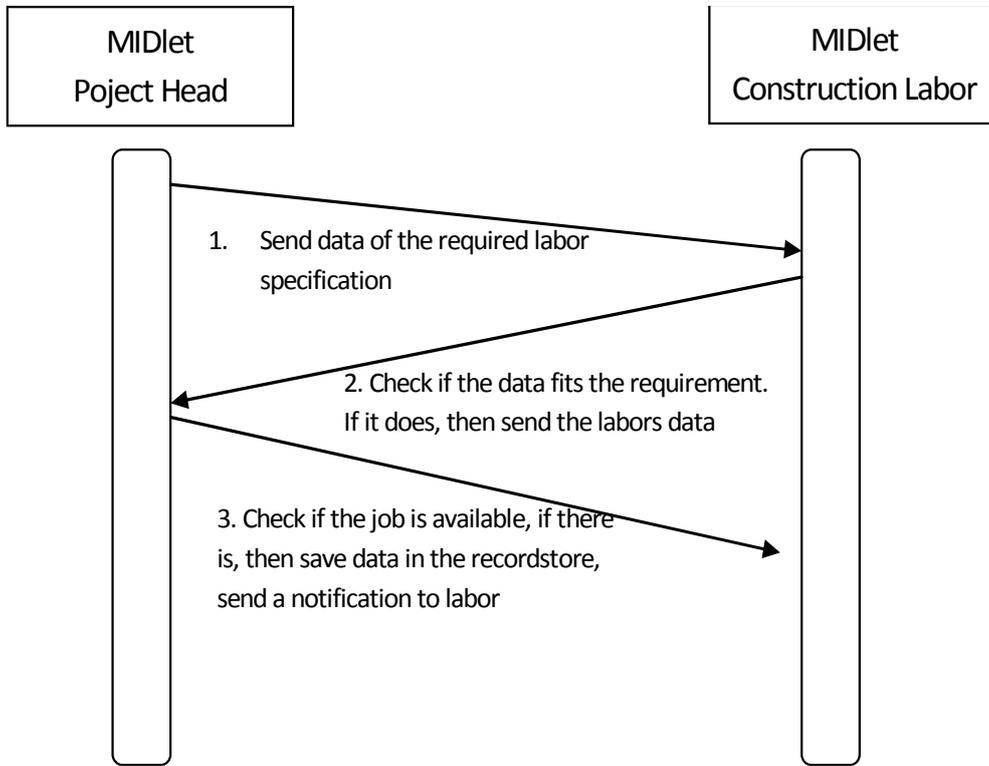


Figure 4. The system process

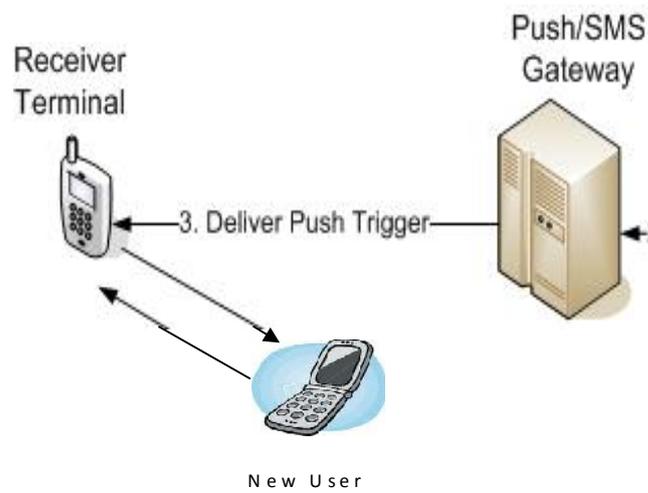


Figure 5. SMS Gateway

Based on the step described above, the system will search the construction labor specification that the best fits the requirement given by the head project. A labor will receive only one offered job via SMS from the head project. This way will ensure that there is no overlapping offer for one labor. The SMS can be the job contract between the construction labor and the head project.

This system uses SMS feature as the data connection. For this purpose each cellular phone of the community member has to keep other member's cellular phone number. To realize this is not an easy work to do, because new member could register to the system and no one notices. Solving this problem, a simply database is built to collect the phone number of the community. In this way, the labor that is willing to join the community has to enroll himself via SMS to a certain number. It means that the SMS has to deal with database. For this purpose a system which is called SMS Gateway has to be built (P 2009). Everytime a new member register to the community the system will automatically send update to all community members.

#### IV. RESULT AND ANALYSIS

Implemented system will solve Human Resources Management of Construction Labors as the system allows

- Labors get the information projects continuously.
- Labors get the job that fits to their skill specification.
- Labors get the information directly from the head of the project, thus there is no misinformed in the amount of the payment.
- The head of the project is easy in looking for the labor based on his skill that he has to hire.
- The payment is transparent because it is written in the SMS.
- The proportion of job distributed to the labor is even

Though, there are some challenges in applying the idea, which are:

- Data collection of the construction labor's phone number will take much time and effort. Therefore, government participation is a big help to solve this problem.
- Connection through SMS is becoming more expensive when more member of the community registered. Cooperation from the cellular provider on giving special price for this community member or even a free connection for this application.

- Data could be invalid if there is one community member that does not fill the data form correctly.
- Security problem is also a concern.

#### V. SUMMARY

Construction labors job is a project with a particular period where the payment is calculated per day. If the construction project is done, then the labors have to find another project in order to support their family. The idea being proposed here is a job search system for Construction labor community using the cellular phone application. This distributed system is conducted using Java ME, Record Management Store (RMS), and Short Message Service (SMS). The system allows searching feature that matches a specific work and the related construction labor specification. This prevents the discontinuity of the project to be done by the labors thus they will get paid continually.

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