DRIVER ONLINE MOBILE APPLICATION DEVELOPMENT BASED ON ANDROID (CASE STUDY PT. TUNAS JAYA PERSADA)

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ABSTRACT

PT.TUNAS JAYA PERSADA is one of many companies which engaged in rental cars and drivers services provider. They are still using un computerize system when doing the business, so this system makes some problems, such as low processing of data that has not been controlled due to the frequent occurrence of recording errors, errors in the calculation of transaction and the slowness in making the report. The purpose of this research is to know the running system in the company, designing, and implementing the new development system of online driver mobile applications based on android in PT.TUNAS JAYA PERSADA. The purpose of this research intends to add insight and knowledge as well as implementing the theory into the company.

This research uses the descriptive method with case study approach in PT.TUNAS JAYA PERSADA. While the resource of the study with primary data collection methods will be done by observation, interviews, and secondary data collection. The method which used in this development system is using a prototyping technique. The system design modeling tools are using a structured model approach using flow map, context diagram, DFD, data dictionary, normalization, relation table and ERD tools. The programming language which is used in this development is Java Programming Language using MySQL database server.

The development of this system is expected could helping the administrator staff to do the tasks and making the report easier than before.
Keywords: Rental, Driver Online, Prototype, Descriptive Methods, Android

1. INTRODUCTION

PT. Tunas Jaya Persada is one of the companies engaged in the tour and travel services that have a purpose in supporting the Indonesian tourism activities and provide convenience to the public in getting the tour and travel services, the company also provides rental services and rental car drivers.

The Company has a driver as much as 30 employees. Number of days outstanding orders as much as 20 to 30 orders, for the weekend of 25 to 40 orders and a long holiday as much as 35 to 60 orders. Based on these data it was concluded that the erratic order entry. To accomplish these firms set of drivers into two kinds of drivers, the driver remains and freelance drivers. If all drivers made drivers stay then there are two things the problems occurred. First in terms of time, when the order was quiet so many drivers that do not work and it will be a waste of time waiting for orders driver. With the status of freelance driver then the driver will only be contacted if there are orders. It could also benefit the driver, the driver can perform other work while waiting for orders.

Under the system set driver, the Company has experienced several problems. The first is the difficulty of knowing the driver when contacted ready to accept orders. Because the system contact the driver by contacting one by one driver.

With such systems are very inefficient and spent quite some time. With the current system, companies find it difficult to know the location of the driver who will accept orders. So it takes the system that supports it. The system is needed when there are orders in quick time and the company will deliver the ordered items to the driver with the closest location. In the process of running the driver orders the company needs to know the whereabouts of the driver by doing the monitoring. With the aim to monitor if there are drivers out of the path of the ordered items.

Perusahahan set booking system driver service and tour and travel services in a way the customers come to the place or customers to place orders over the phone. The system is based on the company felt that the system does not provide convenience to customers. So the company needs an application that allows customers to book directly through smartphones.

Based on the problems that have been described, it can be concluded the need to build a mobile application driver. The platform is being used as a pilot project this software is an android with the consideration that the current android has a market share of 70% of all smart devices that are enabled [1]. With the development of this software

is expected to be the perfect solution to support the company in the car rental business rental. Therefore, based on the description above, it will be built a mobile application for drivers at the company. So I picked up the theme and title of " DRIVER ONLINE MOBILE APPLICATION DEVELOPMENT BASED ON ANDROID (CASE STUDY PT. TUNAS JAYA PERSADA)"

1.1 Driver

*driver*is a professional driver who is paid by the employer for driving a motor vehicle. Driver is divided into two parts, namely private drivers who use private vehicles and the second is a company driver who works for the public transport companies such as taxis, buses, or transportation of goods [3].

1.2 Applications Mobie

Mobile applications is an application that lets you perform mobility by using devices such as PDAs, cell phones or mobile phones. By using the mobile app, you can easily perform a variety of activities ranging from entertainment, selling, studying, doing office work, browsing, etc. [4]. Examples of mobile programing for mobile phones:

1. JavaFX Mobile, is used on Android smartphones.
2. J2ME (Java 2 Mobile Edition) is the most common and widespread that support, blackberry is still using the additional J2ME API. J2ME is a set of specifications and technologies that focus on consumer devices. This device has a limited amount of memory, spend a little power from the battery, the small screen and low network bandwidth.
3. In Symbian C ++ framework, is specifically for mobile phones with Symbian OS.
4. C # .NET, for mobile phones with Windows OS
5. *flash Lite*, Flash games on mobile.

1.3 Android

Android is an operating system based on Linux is Open Source is designed for touch screen mobile devices such as smart phones and tablet computers. Android was originally developed by Android, Inc., with financial support from Google, which then bought it in 2005. The operating system was released officially in 2007, in conjunction with the establishment of the Open Handset Alliance, a consortium of companies hardware, software, and telecommunications that promotes open standards mobile devices. The first Android phone went on sale in October 2008 [5]. Android OS has a very good, fast and strong and has an intuitive user interface that is packed with choice and flexibility.

Android SDK (Software Development Kit) provides the tools and APIs needed for developing applications on the Android platform using the Java programming language.

Android has other programming paradigms unlike regular programming paradigm in which applications are run on the main () function, android system running the code in the method Activity by applying a specific callback method that is appropriate to a particular stage of the life cycle. Any application that runs in android operating system has a different life cycle with a desktop application or web, This is because the mobile application has a level interrupt process fairly high as when handling incoming calls application are required to stop the process temporarily, Application life cycle also helps to ensure the application not depleting the battery.

Inside there android activity where these components gives the interaction between the user and the applications that are built through the user interface. Activity has a life cycle, called Android Life Cycle.

1.4 JSON

JSON (Java Script Object Notation) is a lightweight data interchange format, readable and writable by humans, as well as easily translated and made (generated) by computer [11]. JSON is made of two structures, namely:

1. Set of name / value pairs. In some languages, this is stated as an object (object), record (record), structure (struct), dictionary (dictionary), the hash table (hash table), keyed list (keyed list), or associative array.
2. Terurutkan value list (list of values). In most languages, this is expressed as an array (array), vector (Vector), lists (list), or sequence (Sequence).

JSON using the following forms:

1. objects

   The object is a pair of name / value is not terurutkan. The object begins with {(brace) and ends with} (curly brackets). Each name is followed by: (colon) and each name / value pairs are separated by, (comma).

2. array

   Array is a collection of value terurutkan. An array begins with [(open square brackets) and ends with] (brackets lid). Each value is separated by, (comma).

3. Value

   Value (value) can be a string in double quotes, or a number, or true or false or null, or an object or an array. These structures can be nested.

4. *string*

*string*is a collection of zero or more Unicode characters, wrapped in double quotes. In the string can be used backslash escapes "\" to form a special character. A character representing a single character in the string. String is very similar to the C string or Java.Angka, octal and hexadecimal formats are not used.

2. CONTENT OF RESEARCH

2.1 System Architecture Analysis

The analysis aims to identify the system architecture architecture that will be built based on two subsystems web and mobile

1. Sub System Architecture Web

web platform is one of the subsystems selected for the development of this software. Users software platform is divided into two: Administrators and users. Administrator in charge for data processing user content. Here is Figure 1 Architecture software on a web platform. This image depicts the overall architecture of the system on a web platform.



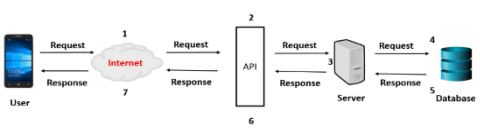
Picture 1 Sub System Architecture Web

Below is a description of Figure 1 Architecture software on web platform:

1. Sub Admin web system requests a data request through the Internet.
2. *server* receives request data requests.
3. *server* retrieve data from the database on demand.
4. *database* response requested data server and sends that data to the server.
5. *server* send the requested data through the Internet to a computer Admin.

2. Sub System Architecture Mobile

*mobile platform*is one of the subsystems selected for the development of this software. Architecture software on the mobile platform describes how the software interact with each other as illustrated in Figure 2 the architecture of the software on the mobile platform. The image depicts the overall architecture of the system on the mobile platform.



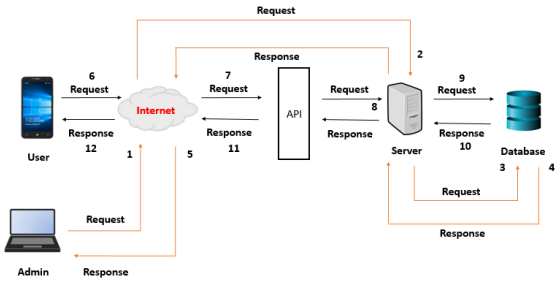
Picture 2 Sub System Architecture Mobile

Below is a description of Figure 2 Architecture software on mobile platforms:

1. The mobile device user request data to the server via the Internet.
2. Then the data is passed through the API request.
3. *server* receiving a data request.
4. *server* retrieve data from the database on demand.
5. *server* receives the response data on the requests from the database.
6. After the server receives the data requested data will be returned in the form of JSON.
7. Then returned for processing the user's mobile device

3. Overall System Architecture

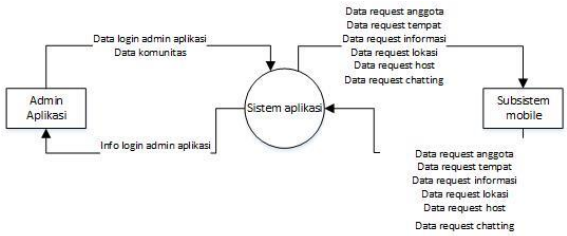
Once you know the system architecture *web platform* and mobile, in Figure 3 show the analysis of the overall system architecture



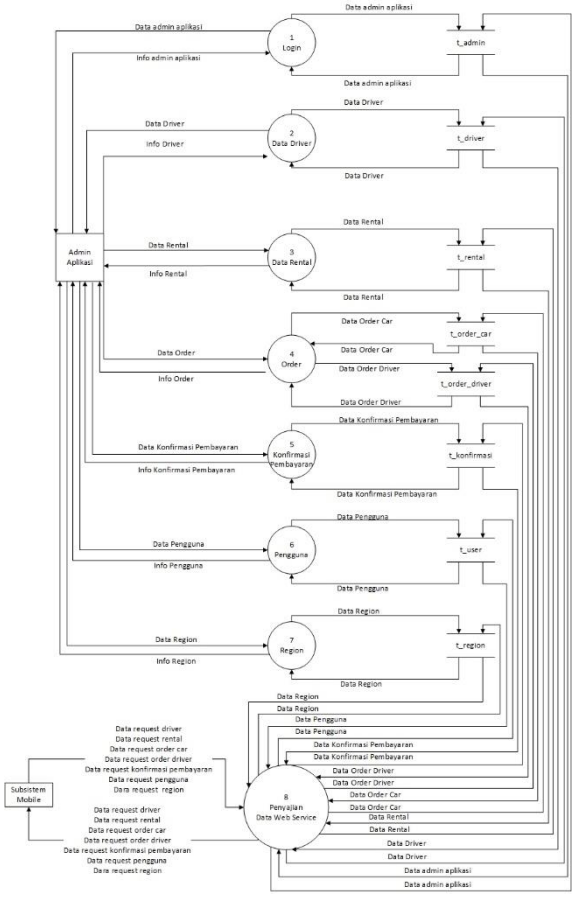
Picture 3 Overall System Architecture

2.2 Functional Needs Analysis Web

The analysis of functional requirements that are discussed in the form of context diagram and data flow diagram (DFD) level 1 For a software context diagram can be seen in Figure 4, while DFD level 1dapat seen in Figure 5 below.



Picture 4 diagram Context



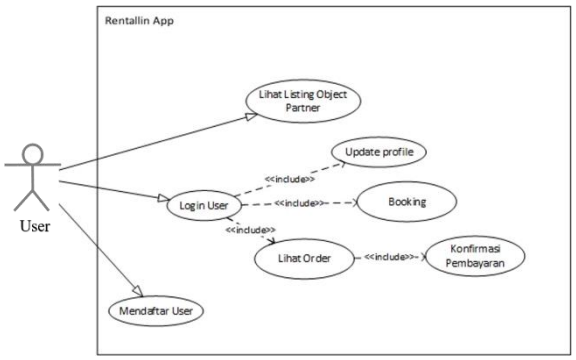
Picture 5 DFD Level 1

2.3 Functional Needs Analysis Mobile

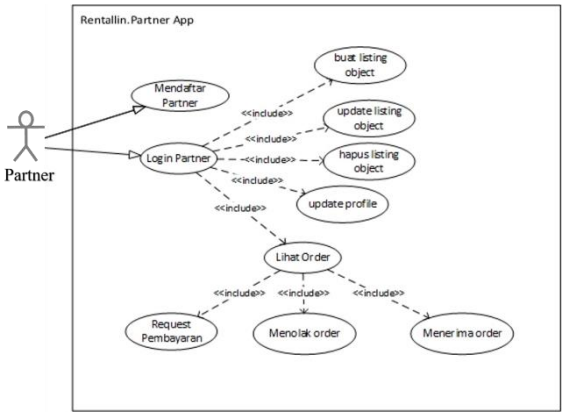
Functional Needs Analysis Mobile using use case diagrams to portray the existing functionality in the software to be built

1. Use Case Diagram

   Use Case Diagram is a model to describe the behavior (behavior) software that will be created.



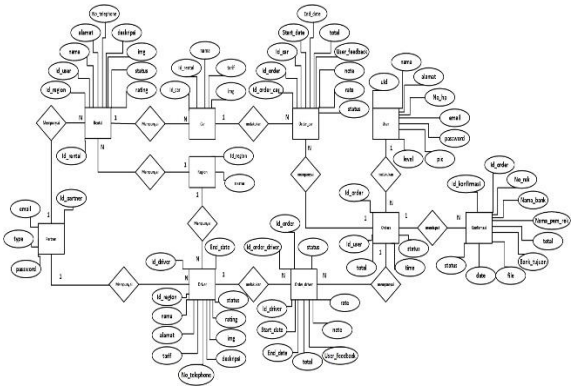
Picture 6 Use Case Diagram Rentalin App



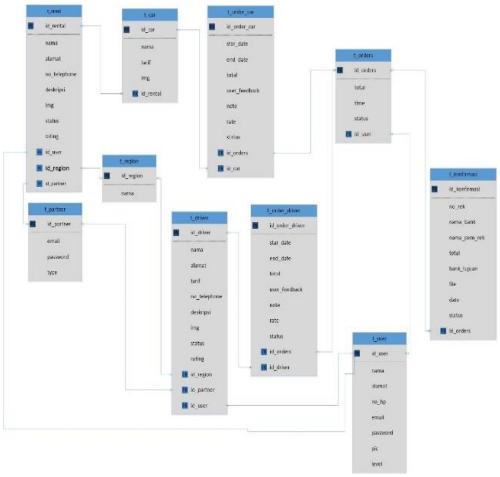
Picture 7 Use Case Diagram Rentalin.Partner App

2.4 Design Data

Below will be delivered on the Entity Relationship Diagram (ERD) of the software being built. EDR can be seen in Figure 1. While the relation to the scheme can be seen in Figure 2.



Picture 8 Entity Relationship Diagram (ERD)



Picture 9 Relation scheme

2.5 System implementation

Implemementasi stage is a stage translation system design based on the results of the analysis into a particular programming language and application software that is built on a real

environment. In this phase there is a need for such a system suggested

1. Hardware Requirements

On **Table 1 Hardware Minimum Requirement** addressing the recommended hardware requirements in the implementation phase

Table 1 Hardware Minimum Requirement

website	Android
1. Processor @ 1.6 GHz	1. Processor @ 800 Mhz
2. Hard Drive 80 GB	2. SD Card 1 GB
3. Memory 1 GB	3. Memory 512 MB
4. VGA 128 MB	4. Internet Connection
5. Monitor 14 inch	
6. Mouse and Keyboard	
7. USB port at least 2	
8. Internet Connection	

2. Software Requirements

On **Table 2 Minimum Software Requirement** show software recommended in the implementation phase

Table 2 Minimum Software Requirement

Sub web system	Sub mobile systems
Windows 7 Operating System	Operating system Android 4.0 Ice Cream Sandwich
Web Browser Mozilla Firefox, Google Chrome	

3. Needs Server

On **Table 3 Minimum requirement Server** show server recommended the implementation phase

Table 3 Minimum requirement Server

Sub web system
Web Space 500 MB
Bandwidth 375.15 MB Month
MySQL Database (05/05/36 - cll)
PHP 5.4.40
CPanel 11.52.1 (build 3)
Apache 2.2.29

2.6 testing Systems

Phase Tests conducted for the software that is built consists of three parts:

1. Testing plan

System testing will be performed divided into two stages. The first phase of testing focused on the functionality of the software that is built using blackbox testing method. The second phase of testing will focus on the assessment of software that is built, the method of data collection is done is a questionnaire that will be distributed to 41 early adopter software. Distributing questionnaires done in two ways, the first way is to use conventional methods such as visiting prospective users directly, the second way is to use the internet media.

2. Functionality Testing Results

Results of testing the functionality of the software that is built looks on **Table 4 Functionality Testing Results**

Table 4 Functionality Testing Results

class Test	points Testing	types of Tests	Testing methods
Login Partner	Input data is logged partner	Black Boxes	Equivalence Partitioning
	Validation partner login	Black Boxes	Equivalence Partitioning
List of Partners	Input data register partnet	Black Boxes	Equivalence Partitioning
	Validation List	Black Boxes	Equivalence Partitioning
Payment request	Input request payment	Black Boxes	Equivalence Partitioning
	Pressing the send button	Black Boxes	Equivalence Partitioning
Make Listing Object	Input object listing	Black Boxes	Equivalence Partitioning
	Pressing the save button	Black Boxes	Equivalence Partitioning
User Login	Input user login data	Black Boxes	Equivalence Partitioning
	User login validation	Black Boxes	Equivalence Partitioning
User list	Input data user list	Black Boxes	Equivalence Partitioning
	Validate user	Black Boxes	Equivalence Partitioning
booking	input booking	Black Boxes	Equivalence Partitioning
	Pressing the save button boking	Black Boxes	Equivalence Partitioning
Payment confirmation	Input data payment confirmation	Black Boxes	Equivalence Partitioning
	Pressing send confirmation of payment	Black Boxes	Equivalence Partitioning

3. Beta Testing Results

Results of testing the beta of the software built looks on.

Table 5 Beta Testing Results

Aim	Question	Question	Average	Value
Easing PT. Tunas Jaya Persada know the driver is ready to accept orders	*driver* 1	The software is easy to use driver	**4:47**	**4:09**
	driver 2	The software	**4:17**	

Aim	Question	Question	Average	Value
		interface is easy to understand in this platform driver		
	driver 3	Features that exist in this software is the right features for the driver PT. Tunas Jaya Persada	**4.0**	
	driver 4	*driver* easily getting orders from customers through the application made	**3.76**	
Easing PT. Tunas Jaya Persada know the driver is ready to accept orders	Company 1	The software is easy to use enterprise	**4**	**3.75**
	Company 2	The software interface is easy to understand in platform companies	**4**	
	Company 3	Features that exist in this software is the right features for PT. Tunas Jaya Persada	**3**	
	Company 4	Companies easily identify drivers who are receiving orders	**4**	
Make it easier for customers to book car and ordered the driver is already berpengalamandengan locals	Customer 1	The software is easy to use customer	**4.43**	**3.84**
	Customer 2	The software interface is easy to understand in platform customers.	**4**	
	Customer	Features that exist	**3.47**	

Aim	Question	Question	Average	Value
	3	in this software is the right features for you as a customer		
	Customer 4	Customers easily make the car rental process through the application made	**3.65**	
	Customer 5	Customers easily determine which drivers are selected in orderanny a	**3.65**	

Based on the test results Table 5 5 acceptance test data can be drawn several conclusions including

a. From the results of the calculation details of the questionnaire can be concluded that the first objective that is easier for drivers to get the order in PT. Tunas Jaya Persada has an average value of 4.09. Since the average indicator first goal more than equal to 3 then this software is considered positive and helpful for the driver PT. Tunas Jaya Persada. The second purpose of the user obtained the response from users, namely users find it helpful in determining the appropriate costs in finding an important place in an emergency. This is evident from the results of acceptance testing for the second goal to get an average score of 4.
b. Then the second goal which facilitate PT. Tunas Jaya Persada know the driver ready to accept orders have an average value of 3.75. Since the average indicator of the second goal more than equal to 3 then this software is considered positive and helpful PT. Tunas Jaya Persada know the driver is ready to accept orders
c. While the third objective that is easier for customers to book car and ordered the driver has already experienced an average value of 3.84. Since the average indicator third goal more than equal to 3 then this software is considered positive and help customers to book car and ordered the driver already experienced.

3. CLOSING

The conclusions and recommendations obtained from the results of this study are:

A. *Conclusion*

Based on the results of testing mobile application software Driver Online on android platform it could be concluded as follows:

1. Mobile application software Driver Online on android platform is already helping drivers get the order.
2. Mobile application software Driver Online on android platform is already helping PT. Tunas Jaya Persada know the driver is ready to accept orders.
3. Mobile application software Driver Online on android platform is already helping customers book the car and ordered the driver already experienced.

B. *Suggestion*

Mobile application software built Driver Online is a product-focused management processes PT. Tunas Jaya Persadaof drivers and customers. Therefore, there are some suggestions that can be used as an alloy of software development into a better direction to support the management company of the driver and the customer. As for suggestions on the development of mobile application software Online Driver are as follows:

1. Developing software to transfer feature.
2. Develop a platform that can be supported by the software since currently only supports the android platform.

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