Development of Parking Retribution System with Mobile Application

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***Abstract*—A computer based parking retribution system has ever developed before. This system can cover parking retribution system at a building and has been build on web application. But this system just can work in one building, so the Manager just can see the report from the related building. This paper presented the enhancement of parking retribution system. The system will be built on web application and mobile application. This system can be accessed via Internet or mobile application and from the testing, the system give more than 90% true result from all of procedure that have tested**

Keywords—Mobile Application, Parking Retribution System, Web Application

I. INTRODUCTION

Nowadays, need of automation process becoming hot issue. Every task have to build based on computerized system to simplify people's task and also to reduce human error. Every field of life without exception have to and must to apply this system. And this is also occur in parking retribution process.

Conventional parking retribution process give a lot of problems. For example corruption practice, human error, slow service, difficulty of making report, moreover if the service parking company have applied their system for more than one building. It will be troubling the company to manage the resources. The parking company have to change their conventional system and apply the computerization system that provide facility to eliminate those problems.

This research concern on enhancing parking retribution system that have previously developed [1]. This system will build on two subsystem. First is local system that will be installed in each building(system that have developed). The second is web system that will be installed in web and can be accessed via Internet and Mobile Application. The local data in each building will transferred into web system periodically which is provided with cryptography[2-3] in order to secure data delivery.

II. DEVELOPMENT

As thought before, the old system just can be accessed by local system. So the system in each building doesn't connected. The old system topology can been describe as figure 1.

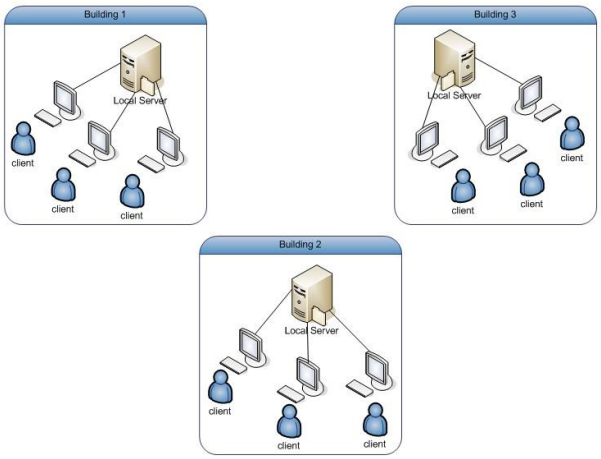

Fig 1. Old System Topology

This new parking system topology can describe as general representation of the system. The system topology can be seen in Figure 2. The new system is build into two major subsystem there are Local System and Web System. The local system will be installed in local area in each building, so for any transaction in each building will be accessed by and store in local server. The web based system will be installed in web, in order to simplify manager to see the report without go to each building. The web system can be accessed via internet by mobile application and web based application.

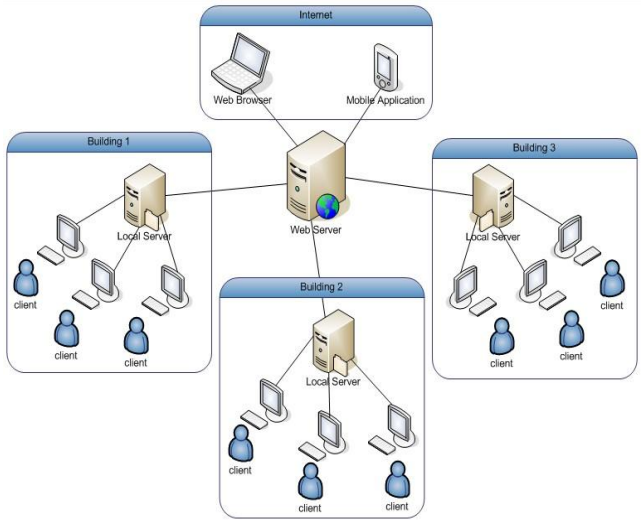

Fig 2. New System Topology

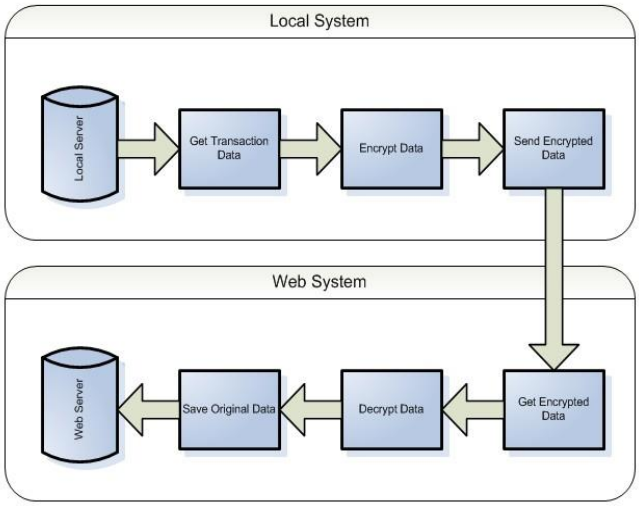

Fig 3. General Illustration of Data Delivery

Transaction data from local server will be transferred to the web server periodically. And the transferred data between local system and web system will be provided with cryptography in order to secure the data delivery figure 3.

The new system has few more menu than the old system. The structure can be seen in figure 4 is web based application and in figure 5 is mobile application. The menu with blue highlight is the old system and the yellow highlight is the extend menu for the new system.

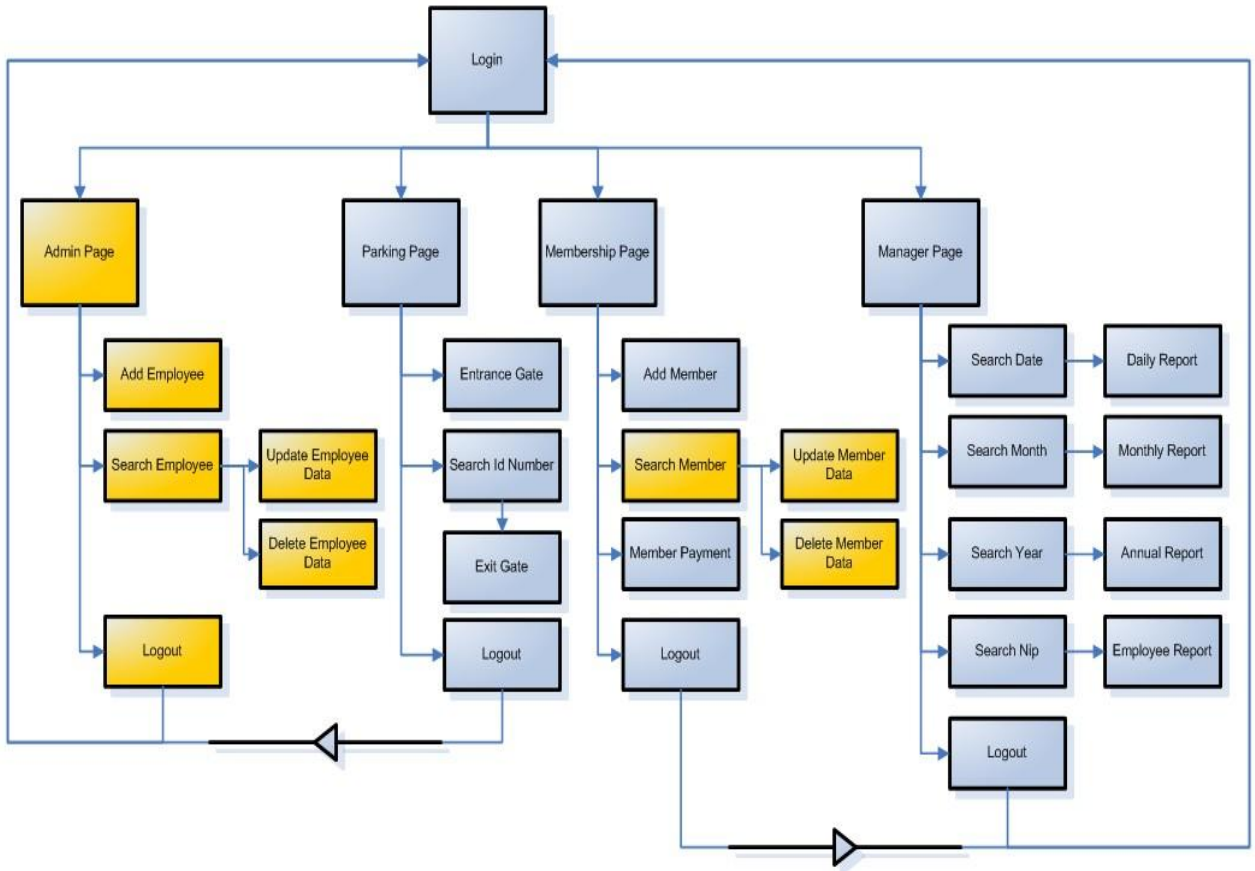

Fig 4. Navigation Structure for Web

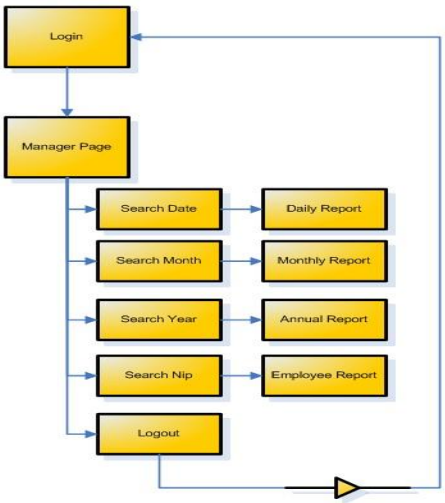

Fig 5. Navigation Structure for Mobile

We can illustrate the use case diagram as below

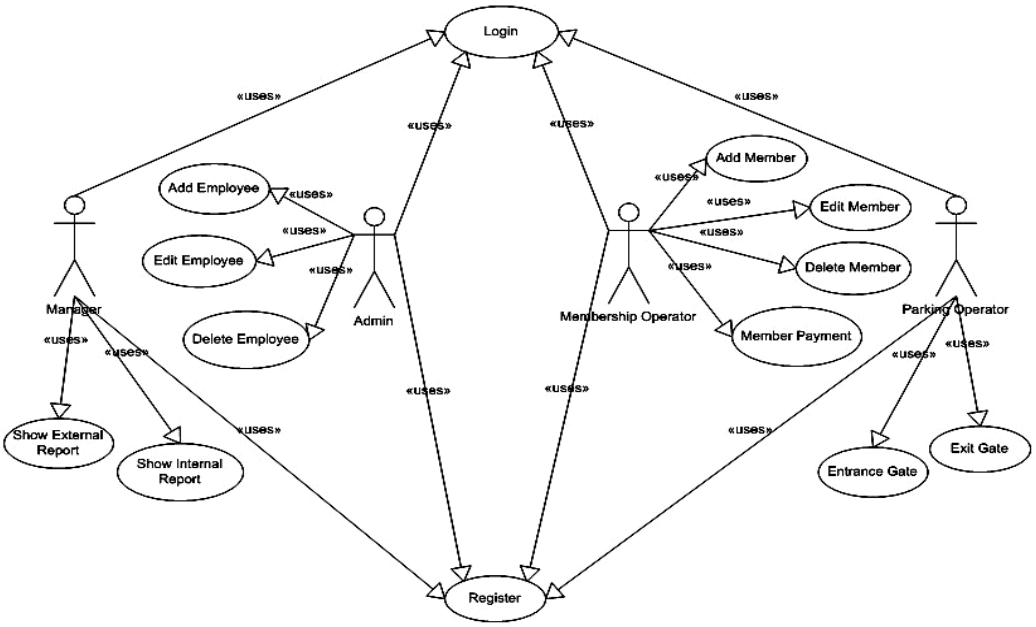

Fig 6. Use Case Diagram

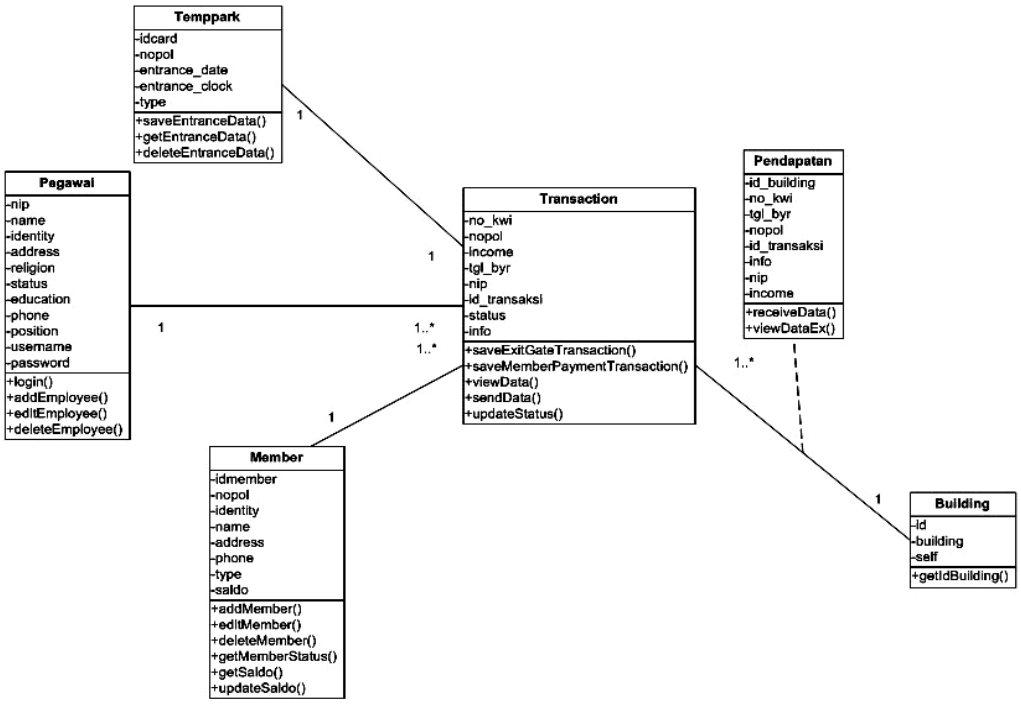

Fig 7. Class Diagram

Explanation about class diagram above:

1. One user have ability to do one up to many transaction, but one transaction just can be done by one user.
2. One temporary park transaction just can be accessed by one transaction, and one transaction just can be take one temporary transaction.
3. One member can do one up to many transaction, but one transaction just can be done by one member.
4. One transaction just can be having by one building, but one building can have one up to many transaction.

III. TESTING AND RESULT

As thought before, this system will be build into two major subsystem, there are Local System and Web System. In local, the system will be build upon web based application. And for Web system, it will be build upon two platform, there are web based and mobile application

For web based application, it developed using PHP programming language[4]. And mobile application developed using Java programming with J2ME [5]. This programming language election is because the programming languages using open source license and library support, so for general function, we just need to call it.

For cryptography implementation in sending data from local server to the web server, send and get data in web system, it use Asymmetric Encryption, in this case, using RSA algorithm. It because this algorithm relatively secure. The security is located in difficulty of wide *n* modulus factoring

For database, we use MySQL [6] for implementation. It because it is free, and it is quite enough for this application. The other reason is because PHPand Java have predefined MySQL function in their library, so we just call the MySQL function to use it.

The following tables are the results of testing on web and mobile applications

TABLE I. WEB BASED APPLICATION PROCEDURE TESTING

Procedure	Testing	Expected Result	Result
Login	Username and password have not filled	-Error Warning Appear	True
	Username not found	-Failed to login	True
	Username found but wrong password		True
	Username and password true but not Manager		False
	Username and password true and enlisted as Manager	User login into system	True
Daily Report	All field have not filled	-Error warning appear	True
	No transaction at requested date	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Monthly Report	All field have not filled	-Error warning appear	True
	No transaction at requested month	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Annual Report	All field have not filled	-Error warning appear	True
	No transaction at requested year	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Employee Report	All field have not filled	-Error warning appear	True
	No transaction at requested NIP	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True

TABLE II. MOBILE APPLICATION PROCEDURE TESTING

Procedure	Testing	Expected Result	Result
Login	Username and password have not filled	-Error Warning Appear	True
	Username not found	-Failed to login	True
	Username found but wrong password		True
	Username and password true but not Manager		True
	Username and password true and enlisted as Manager	User login into system	True
Daily Report	All field have not filled	-Error warning appear	True
	No transaction at requested date	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Monthly Report	All field have not filled	-Error warning appear	True
	No transaction at requested month	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Annual Report	All field have not filled	-Error warning appear	True
	No transaction at requested year	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True
Employee Report	All field have not filled	-Error warning appear	True
	No transaction at requested NIP	-Report showed failed	True
	All field have filled and there are transaction	Report Showed	True

From the testing that have done above, we can see that the all procedure almost give true result. There is only two failed test. That is if the users do not have the permission to access the system there is no warning given by program. Although the code have describe this situation.

For the result it can see the result as example below :

Fig 8. Web Login Form

Fig 9. Daily Report on Web

(a) (b)

Fig 10. (a) Mobile Login form and (b) Daily Report on Mobile

IV. CONCLUSION AND SUGGESTION

After doing some tested and analysis, we get some results. They are:

1. We successfully enhance the old system with adding some features, build web system that connect all building and can be accessed via Internet or mobile application
2. From the testing above we can see that the system give more than 90% true result from all of procedure that have tested.

For the future work, writer has some suggestion

1. The local system build upon web based application, so furthermore it can be build upon general desktop application as Java or Visual Basic for faster execution.
2. This system just software prototype, so it will be more perfect if the application can connected to the hardware like sensor to read the id card or printer to print the report
3. The report just showed in general table, next developing maybe report in graphical will made.

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