APPLICATION SYSTEM OF PARKING MOTOR VEHICLES AND HAVE LUNCH BY USING RFID IN PT SURYA TOTO INDONESIA TBK

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ABSTRACT

PT Surya Toto Indonesia Tbk is one of the largest sanitary ware manufacturer in South East Asia. The company produces various sanitary ware and plumbing fittings for the domestic and foreign the market. PT Surya Toto Indonesia Tbk has a as many more than 2800 employees, so that the company had difficulty in managing operating costs and the reporting of data daily, especially in the parking system and the system of employees have lunch because still use the manual method using a stickers and voucher. Therefore created a system that can solve the problem by using RFID technology (Radio Frequency Identifacation) integrated, so that the data collection employees parking and have lunch can be easily monitored by management and may reduce the risk of fraud and far more secure than a previous system.

Keywords : Saniter, Plumbing Fitting, Parkiring, Have Lunch, RFID.

1. INTRODUCTION

RFID technology (Radio-Frequency Identification) is a technology that is expected to replace barcode optics in the future. Advantages of RFID compared to conventional barcode, among others, RFID can perform many-to-many communication that can be interpreted many reader can read a tag, and a reader can read many tags, and use wireless data transmission as compared with conventional barcode that uses optic. With strengths, promising prospects of RFID systems for a variety of needs, especially for industries, such as library management, pharmacy inventory management, supply chain management, smart cards and many more [1].

1.1 Background

PT Surya Toto Indonesia Tbk currently has some problems in the daily operations of their company. A large number of employees make the company PT Surya Toto Indonesia Tbk difficulty in creating a system that can automatically record and report employee's overall needs.

From the overall problem set by the company PT Surya Toto Indonesia Tbk through its representative, there are two main problems faced by purusahaan toto in daily operations with the last few years, namely the problem of parking systems of motor vehicles of all employees and distribution systems lunch received every day by the employees.

Both the above systems today still use manual way both in data collection and sharing of parking vehicles lunch coupon. So the problem that arises is the data collection process becomes very long and the risk of error becomes greater recap.

From the above issues, then we propose based on Radio Frequency Identification technology that will be owned by every karayawan PT Surya Toto Indonesia Tbk in operating activities in when being in a corporate environment. The use of RFID technology is expected to solve existing problems in PT Surya Toto Indonesia Tbk because each employee will have a unique code in every activity he is doing as well as integrated with one another. So that recaps the data can also be monitored in real time from the human resources department or part of the administrative personnel PT Surya Toto Indonesia Tbk.

1.2 Identification of problems

Based on the background of the problems that have been described, the following is a list identifying the problem of background:

1. Difficulty in making a system that can automatically record and report employee's overall needs.
2. The motor vehicle parking system and the distribution system is still manual lunch.
3. Control the manual master data both motor vehicle parking and lunch.

1.3 Intention

The purpose of this research is to create a system of data collection or recording a secure and easily create reports motor vehicle parking and lunch, made into a computerized system, making the data

motor vehicle parking and lunch to be integrated so easily accessible.

1.4 Tahapan Penelitian

Adapun tahapan penelitian yang dilakukan sebagai berikut:

1.4.1 Metode Pengumpulan Data

Here is a method of data collection in this study:

1. Literature

The data collection is done by studying, researching, and studying the literature of library sourced from books, journals, websites, and other literature related to the research.

2. Interview

Interviews conducted by a question and answer to the parties concerned to know the problems that occur in the environment PT Surya Toto Indonesia Tbk.

1.4.2 Software Development Methods

In making this application using the waterfall model as the stage of development of the software, while the process is carried out as follows:

1. Requirement analysis and definition

Requirements analysis and definition phase is the stage where the collection needs have been defined in full and then analyzed and defined needs that must be met by the program to be built. This phase should be done in full in order to produce a complete design.

2. System and software design

System and software design stage is the stage of designing software that worked after completion requirements are collected in full.

3. Implementation and unit testing

Requirements analysis and definition phase is the phase of program design results translated into codes using a programming language that has been determined. The program is built directly tested by its units.

4. Integration and system testing

Tahap *integration and system testing* merupakan tahap penyatuan unit-unit program kemudian sistem diuji secara keseluruhan.

5. Operation and maintenance

Operation and maintenance stage is the stage of operating the program in its environment and perform maintenance, such as adjustment or change because adaptation to the actual situation.

2. LITERATURE

The literature review of this study as follows:

2.1 Radio Frequency Identification (RFID)

Radio Frequency Identification or better known as RFID is a method of identifying objects using radio waves. The identification process carried out by the RFID reader and the RFID transponder (RFID tag). RFID tag attached to an object or an object to be identified. Each RFID tag has a data identification number (ID number) that is unique, so there is no RFID tag that has the same ID number.

In general, RFID has two components, the first component is an electronic object is brought closer to the object identified, this component is called a transponder tag. The second component is a tool that can read the tags (reader). However, these two components alone is not enough to make RFID system functioning. There are other necessary components namely software or applications, the function is as a data processing element of the work of the two components of RFID.

2.2 How to Work RFID

Here is a brief overview of how the system works RFID: RFID reader is always in a condition ready for reading the transponder presence. When a transponder directly transmit data taken when responding to the presence of radio frequency RFID reader. RFID reader immediately receive the transmitted data and then pass the data to the application to do the processing. As in Figure 1.

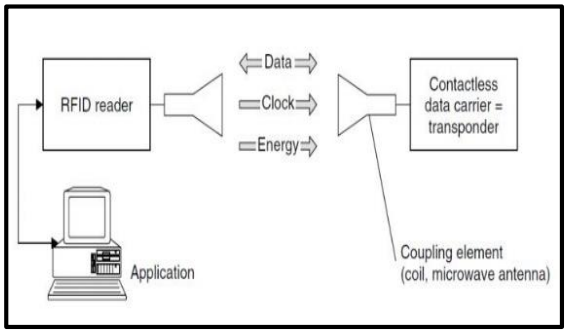


Figure 1 RFID System Components

2.3 Active RFID

These tags can be read (Read) and written (Write). Batteries contained in this tag is used to transmit radio waves to the reader so that the reader can read the data contained in this tag. With the internal battery, this tag can transmit information over longer distances and the reader only requires little power to read this tag. The downside of this type of tag is a high cost and a larger size.

2.4 RFID Pasif

Tag ini hanya dapat dibaca saja (*Read*) dan tidak memiliki internal baterai seperti halnya tag aktif. Sumber tenaga untuk mengaktifkan tag ini didapat dari RFID reader. Ketika medan gelombang radio dari *reader* didekati oleh tag pasif, koil antena yang terdapat pada tag pasif ini akan membentuk suatu medan magnet. Medan magnet ini akan menginduksi suatu tegangan listrik yang memberi tenaga pada tag pasif. Keuntungan dari tag ini adalah rangkaiannya lebih sederhana, harganya jauh lebih murah, ukurannya lebih kecil, dan lebih ringan.

3. ANALYSIS AND DESIGN

As for the analysis and design of research conducted as follows:

3.1 Analysis System Running

Ongoing analysis conducted through interviews and direct observation with relevant officers, the researchers get a running system procedures in PT Surya Toto Indonesia Tbk.

1. Prosedur Pendaftaran Stiker Motor
   a. Employees ask for an application form to the clerk of motor sticker.
   b. The clerk gave stickers motorcycle registration form to the employee.
   c. Employees receive and fill out the registration form stickers motorcycle is complete and correct.
   d. Employees give back the registration form stickers bike if you've filled out completely and correctly to the clerk.
   e. Officers receive a sticker motorcycle registration form that has been filled by employees.
   f. The clerk gave stikes employee registration forms to HRD / GA.
   g. Officers receive a sticker of HRD / GA to be given to employees who have signed up.
   h. Employees receive a sticker affixed to the motor for motor vehicles.
2. Entry Procedure parking area
   a. Employees queue into the parking area
   b. Officers conducted inspection sticker motorcycle employees.
   c. Employees are allowed entry after being questioned by officers because the employees wear motorcycle sticker, if the employee does not use stickers employee, the employee is not allowed to enter the parking area.
   d. Employee parking his vehicle in the parking area that has been provided by the company.
3. Parking Area Exit Procedures
   a. Employees enter and look for each vehicle.
   b. Employees lined up for inspection stickers by officers.
   c. If the sticker has been assessed, the employee is allowed to exit the parking lot by officers.
4. The Lost procedure Motorcycle Stickers
   a. Employees reported to the officer.
   b. The clerk gave form to the employee.
   c. Employees receive and fill out the form completely and correctly.
   d. Employee gives the form again after filled out completely and correctly.
   e. Officers received a form from the employee.
   f. The clerk submits the form to the HRD / GA.
   g. HRD / GA received a form and provide motorcycle stickers to be given to employees who have signed up previously.
   h. The clerk gave sticker bike to employees who have signed up.
   i. Employees receive a sticker motors of officers and paste.
5. Procedure Lunch at Canteen
   a. Employees see the coupon cafeteria lunch whether A or B.
   b. Employees enter the canteen.
   c. Employees provide lunch coupons to the clerk.
   d. Officers received a coupon lunch from employees.
   e. The clerk gave lunch to employees.
   f. Employees receive a lunch from canteen clerk.

3.2 System Architecture Analysis

Motor vehicle parking system applications and lunch using this RFID will be one computer with an RFID reader that will be placed near the entrance of the parking lot and out the parking and entrance to canteen. As for the RFID tag is quite close to the RFID reader. Here the system architecture can be seen in Figure 2.

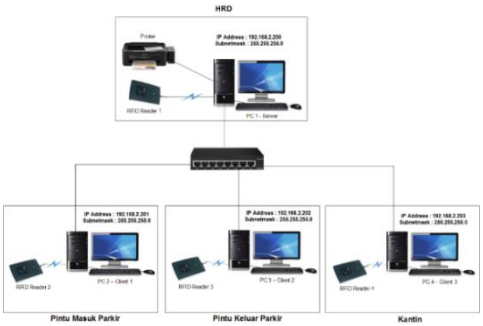


Figure 2 System Architecture

3.3 Use Case

Use case diagrams describe the processes within the system of motor vehicle parking system applications and have lunch with the use of RFID in PT. Surya Toto Indonesia Tbk can be seen in Figure 3.

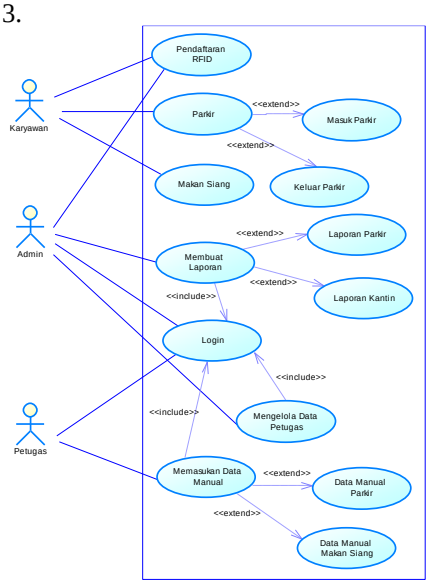


Figure 3 Use Case Diagram

3.4 Design of Interfaces

1. Login Form Officer

Top Form is the login form officers to break into applications, such as in Figure 4.



Figure 4 Views Login Officer

2. Data Search Form

Form a data search data search motor vehicle parking and lunch as needed, such as paga figure 5.

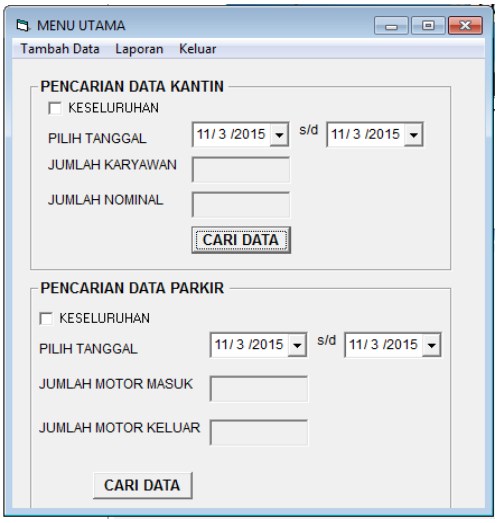


Figure 5 Display Search Data

3. Form Print Report Canteen

Print reports canteen is to print reports daily, weekly or monthly as needed. As in Figure 6.

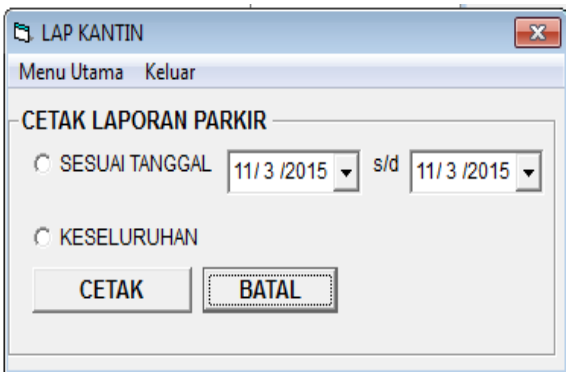


Figure 6 Display Printing Reports Canteen

4. Form Printing Reports Parking

Print reports parks is to print the report for parking every day, week or month as needed. As in Figure 7.

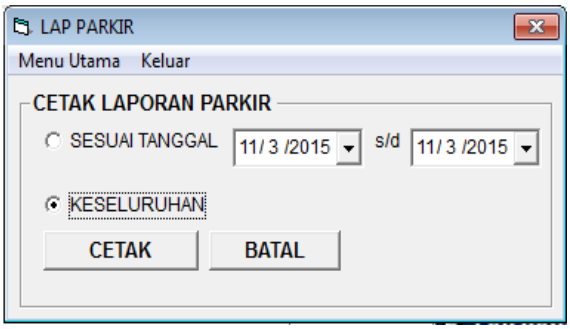


Figure 7 Display Print Report Canteen

5. Display Print Out Parking and Canteen

Display parking print out a report that can be printed daily or monthly. As in Figure 8.

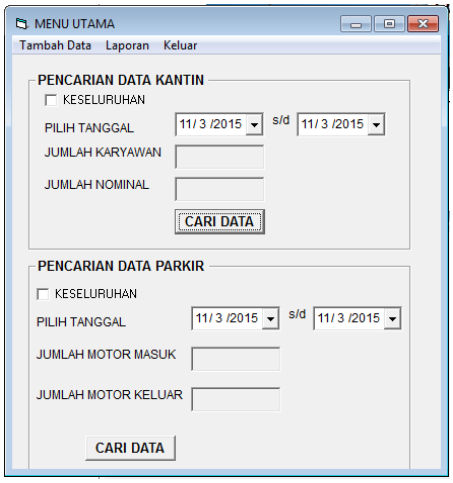


Figure 8 Appviews Parking

6. Application View Parking

Canteen application display is a display application to view users enter and exit the vehicle parked next bermotorsetiap, as in Figure 9.

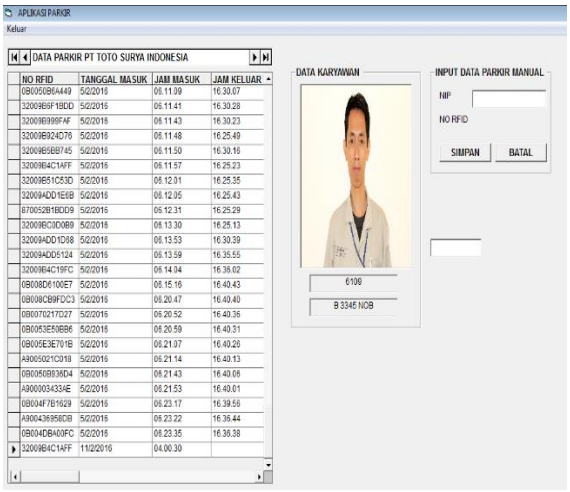


Figure 9 Application View Canteen

4. Implementation and Testing Results

The implementation and testing results of this study as follows:

4.1 Hardware

The hardware used can be seen in Table 1.

Table 1 Hardware Used

No	Hardware	Specification
1	*Processor*	Kecepatan 2.10 Ghz
2	VGA	On Board
3	Memory	2GB DDR3
4	Monitor	14”
5	Keyboard dan Mouse	Standar
6	Mouse	Standar
7	RFID *Reader ID-12*	125 KHz
8	RFID *tag*	125 KHz
9	Kabel Serial	Standart
10	Printer	Standart

4.2 Software

pecifications The software used can be seen in table 2.

Table 2 Software Used

No	Software	Specification
1	Sistem operasi	Windows 7 32 Bit
2	*Web server*	XAMPP 1.7.3
3	mysql-connector	3.51.30-winx64
4	Driver USB Serial	Standart
5	Adobe Reader	XI

4.3 Beta testing

Beta testing is testing conducted objectively. The method used in this beta test is by giving questionnaires to employees who have made application motor vehicle parking and lunch. Samples taken as many as 30 employees, the results for kuesinoer calculation can then be concluded for an assessment of the applications are built.

This test aims to determine whether the application is built to achieve the research objectives. Assessment score given by using Likert scale.

The following is the assessment score given by using a Likert scale on each statement, can be seen in Table 3.

Table 3 Score Questionnaire Answers

Skala Jawaban	Keterangan	Skor
SS	Sangat Setuju	5
S	Setuju	4
KS	Kurang Setuju	3
TS	Tidak Setuju	2
STS	Sangat Tidak Setuju	1

To find the value of the percentage of each answer Likert scale questionnaire used formula as follows:

P= S/(Skor Ideal) x 100

Information:
P : The percentage value searched
S : The number of times multiplied by a score set answers
Skor Ideal : The highest value is multiplied by the number of samples
Top Value = 5
number of Samples = 30
Skor Ideal = (5 x 30) = 150

The points are the subject of a questionnaire assessment of beta testing are as follows:

1. Do you agree that this application can allow you to do the park in PT Surya Toto Indonesia Tbk?
2. Do you agree that these applications can facilitate transactions redemption of coupons lunch in the cafeteria PT Surya Toto Indonesia Tbk?
3. Do you agree that these applications can facilitate transactions redemption of coupons lunch in the cafeteria PT Surya Toto Indonesia Tbk?
4. Do you agree with this application accelerates the queue to park and eat lunch in the cafeteria PT Surya Toto Indonesia Tbk?
5. Do you agree that this application is feasible at PT Surya Toto Indonesia Tbk?

4.4 Questionnaire results

Results from beta testing was conducted using questionnaires to employees of PT Surya Toto Indonesia Tbk, the result of data collection from each answer from each respondent, can be seen in the tables of this diberikut:

1. Do you agree that this application can allow you to do the park in PT Surya Toto Indonesia Tbk?

Table 4 Testing Results Questionnaire Problem No. 1

Keterangan	Skor	Responden	Jumlah Skor
Sangat Setuju	5	9	45
Setuju	4	12	48
Kurang Setuju	3	-	-
Tidak Setuju	2	-	-
Sangat Tidak Setuju	1	-	-
Jumlah		30	93

$$P = \frac{93}{150} x\ 100 = 62\%$$

Based on the percentage value, the number of scores obtained was 93. So based on these data, it can be concluded that the Motor Vehicle System Applications and Lunch with the use of RFID in PT. Surya Toto Indonesia Tbk easily in the park in general is 62% with 30 samples of respondents expected 100% and located in areas not agree. The following scale of assessment number 1 in continuum shown in Figure 10.

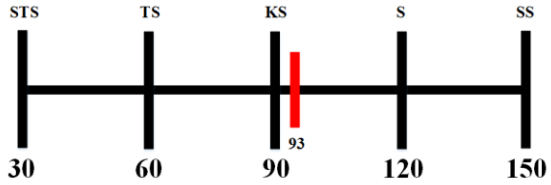


Figure 10 Scale Assessment No. 1

2. Do you agree that these applications can facilitate transactions redemption of coupons lunch in the cafeteria PT Surya Toto Indonesia Tbk?

Table 5 Testing Results Questionnaire Problem No. 2

Keterangan	Skor	Responden	Jumlah Skor
Sangat Setuju	5	10	50
Setuju	4	16	64
Kurang Setuju	3	3	9
Tidak Setuju	2	1	2
Sangat Tidak Setuju	1	-	-
Jumlah		30	125

$$P = \frac{125}{150} \; x \; 100 = 83\%$$

Based on the percentage value, the number of scores obtained are 125. So based on these data, it can be concluded that the Motor Vehicle System Applications and Lunch with the use of RFID in PT. Surya Toto Indonesia Tbk easy redemption of coupons lunch in general is 83% with 30 samples of respondents expected 100% and located in the area agreed. The following scale of assessment number 2 in continuum shown in Figure 11.

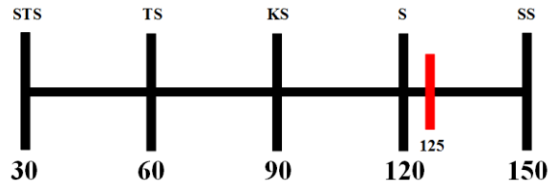


Figure 11 Scale Assessment No. 2

3. Do you agree that these applications can facilitate transactions redemption of coupons lunch in the cafeteria PT Surya Toto Indonesia Tbk?

Table 6 Testing Results Questionnaire Problem No. 3

Keterangan	Skor	Responden	Jumlah Skor
Sangat Setuju	5	13	65
Setuju	4	13	52
Kurang Setuju	3	4	12
Tidak Setuju	2	-	-
Sangat Tidak Setuju	1	-	-
Jumlah		30	129

$$P = \frac{129}{150} \; x \; 100 = 86\%$$

Based on the percentage value, the number of scores obtained are 129. So based on these data, it can be concluded that the Motor Vehicle System Applications and Lunch with the use of RFID in PT. Surya Toto Indonesia Tbk improve security in general is 86% with 30 samples of respondents expected 100% and located in the area agreed. The following scale of assessment number 3 in continuum shown in Figure 11.

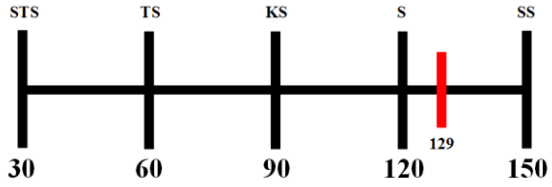


Figure 11 Scale Assessment No. 3

4. Do you agree with this application accelerates the queue to park and eat lunch in the cafeteria PT Surya Toto Indonesia Tbk?

Table 7 Testing Results Questionnaire Problem No. 4

Keterangan	Skor	Responden	Jumlah Skor
Sangat Setuju	5	8	40
Setuju	4	20	80
Kurang Setuju	3	2	6
Tidak Setuju	2	-	-
Sangat Tidak Setuju	1	-	-
Jumlah		30	126

$$P = \frac{126}{150} \; x \; 100 = 84\%$$

Based on the percentage value, the number of scores obtained are 126. So based on these data, it can be concluded that the Motor Vehicle System Applications and Lunch with the use of RFID in PT. Surya Toto Indonesia Tbk accelerate queues parking in general is 84% with 30 samples of respondents expected 100% and located in the area agreed. The following scale of assessment number 4 in continuum shown in Figure 12.

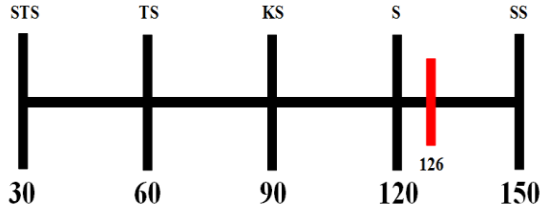


Figure 12 Scale Assessment No. 4

5. Do you agree with this application accelerates the queue to park and eat lunch in the cafeteria PT Surya Toto Indonesia Tbk?

Table 8 Testing Results Questionnaire Problem No. 5

Keterangan	Skor	Responden	Jumlah Skor
Sangat Setuju	5	6	30
Setuju	4	20	80
Kurang Setuju	3	3	9
Tidak Setuju	2	-	-
Sangat Tidak Setuju	1	1	1
Jumlah		30	120

$$\boldsymbol{P = \frac{120}{150}\, x\, 100} = 80\%$$

Based on the percentage value, the number of scores obtained are 120. So based on these data, it can be concluded that the Motor Vehicle System Applications and Lunch with the use of RFID in PT. Surya Toto Indonesia Tbk is already fit for use in general is 80% with 30 samples of respondents expected 100% and located in areas not agree. The following scale of assessment number 5 in continuum shown in Figure 13.

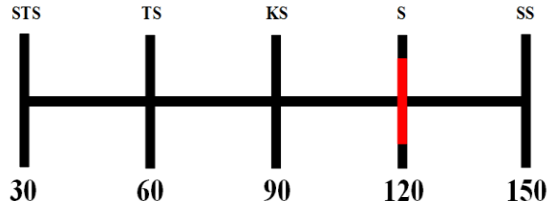


Figure 13 Scale Assessment No. 5

5. CONCLUSIONS

Based on the results of research, analysis, system design, implementation and testing, it could be concluded that the application of the system motor vehicle parking and lunch using Radio Frequency Identifacation technology (RFID) in PT Surya Toto Indonesia Tbk as follows:

1. Applications are made to record statements motor vehicle parking and lunch quickly and accurately because it has been computerized and integrated from the parking area to the HRD and from canteen to the HRD.
2. Application of parking and lunches that have been applied PT Suryat Toto Indonesia Tbk help reduce the risk of errors recap of data that is usually done manually.
3. The application is easier for the company and employees in performing daily activities, especially for parking and lunch because it was recorded automatically by computer.
4. This application can improve security at the parking area of motor vehicles PT Surya Toto Indonesia Tbk.
5. The application can reduce the queue of motor vehicle parking and lunch employees at PT Surya Toto Indonesia Tbk.

The suggestions for further development, namely:

1. To use additional parking barrier automatic doors at the entrance and exit.
2. For applications lunch was placed right in front of the clerk / waitress and made some food pick-up points in order to avoid queues.

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