TEMATIK APERTA NUSANTARA

Nusantara Journal Of Informatics (NIJ)

Journal homepage: https://e-journal.tematikapertanusantara.sch.id/index.php/Nusantara-Journal-Of-Informatics/

HIKING/CAMPING EQUIPMENT RENTAL INFORMATION SYSTEM AT THE MARI MENDAKI GARUT SHOP

Aditya Putra Maulana [1*]
[2] STMIK DCI, Tasikmalaya, West Java, Indonesia
Coresponding Author: Aditiya@gmail.com

ABSTRACT

Mature this , in development science and technology has many new media that can help delivery accurate , fast and reliable information reliable . Currently the internet has Lots utilized Good it is by companies , educational institutions , government . Various field information can presented by the internet including field economics , politics , social and culture. mari shop climb need A capable system processing information data rental with method make application rental android based and online rental so that everything the store offers can accessible to many people and more easy For attract customers. This is a number of method For create a shop let's climb the more growing , because will more known among public with internet media assistance .

In the design system This There is a number of The steps to be designed include Flowcharts, Context Diagrams , Data Flow Diagrams , Entity Relationship Diagrams, and Database Tables. existence system information created , it is hoped can increase rental and expanding the market. With existence system information created , it is hoped can increase rental and expanding the market. From the results manufacturing system information rental outdoor hiking/camping equipment at the Let's Climb Garut shop this , then writer recommend For in the future application This can be updated again with add more features complete .

ARTICLE INFORMATION

Keywords:
technology , systems Information , Internet, Hiking/Camping outdoor, Rentals .

1. Introduction

Development technology information in the digital era has push transformation significant in various sector business , including business micro and retail based services . The use of the internet and mobile devices enables business processes that were previously done manually switch become computerized , integrated , and real-time. One of the sectors that are experiencing improvement request in a number of year final is activity recreation outside room such as hiking and camping. Style trends life Healthy as well as increasing interest public to activity natural open push growth need will hiking and camping equipment .

In Garut Regency , one of the provider service rental outdoor equipment is the Let's Climb Shop. Based on results observation field , system ongoing rentals Still done manually , start from tenant data recording , checking availability goods , up to manufacturing report transaction . The process cause a number of problems , including : (1) inefficiency in data management , (2) potential error recording transactions , (3) limitations access information availability goods for customers , and (4) difficulty monitoring stock in real-time. In addition , customers required come direct to the store for do rental without know moreover formerly availability tools needed . manual system causes inefficiency operational and limitations access information customer .

In a way conceptual , system information defined as a group interconnected components integrated For collect , process , store , and distribute information to support taking decision organization . Implementation system information mobile- based , especially Android, to become solution strategic Because height penetration smartphone usage in Indonesia. The Android platform is open-source, flexible , and supports integration with an online database , so it is very suitable For development system rental based application .

A number of study previously has develop system information rental web- based and desktop-based for various sectors , such as rental vehicles and rentals tool party . Research the generally focus on digitalization recording transactions and creation report . However however , still there is limitations in integration system mobile- based that allows customer do reservation in a way direct through device personal as well as monitor rental status in a way independent . In addition , research related system information rental Android- based hiking/camping equipment , especially on a small scale business local in the area , still relatively limited .

The gap identified research gaps is lack of development system information rental integrated Android- based outdoor tool with management stock , checkout process, rental status , and reporting automatic in one integrated platform . Research This make an effort fill in gap the with design and implement system information rental customized Android- based hiking/camping tool with need operational of the Let's Climb Garut Shop.

2. Method

2.1 Experimental Design

Study This use Research and Development (R&D) approach with method studies cases on the system rental Hiking/camping equipment at the Let's Climb Garut Shop. Research design focused on designing , building , and testing system information Android based for replace manual system in progress walk .

In a way general , stages study consists of from :

1. Identification system problem ongoing rentals
2. Analysis need system (functional and non-functional requirements)
3. Design system (Flowchart, Context Diagram , DFD, ERD)
4. Implementation application Android based
5. Testing systems and evaluation performance

Experimental design applied system development, where the system being developed direct tested in environment store operations for evaluate its effectiveness in :

- Rental data management
- Stock monitoring goods
- Recording transaction
- Presentation report

Approach This allows evaluation based on actual data store operations .

2.2 Implementation Model

Study This implementing computational models integrated rule- based transactional calculation with relational database (MySQL).

Total cost calculation rental using a simple linear regression model deterministic formula based as following :

$$\textbf{Total Cost} = \sum_{i=1}^{n} (\text{Item Price}_i \times \text{Quantity}_i \times \text{Rental Duration}_i)$$

This model integrated in Android system uses :

- Java programming language
- Android Studio as an IDE
- PHP for server-side management
- MySQL as a database

Parameters used in system includes :

- Item ID
- Rental price
- Amount stock
- Rental period
- Payment methods
- Transaction status

Parameter adjustment is done with input validation and restrictions transaction only on goods with status available .

2.4 Evaluation Metrics

For measure level accuracy system in count transactions and minimize error recording , used three metric evaluation :

Mean Absolute Error (MAE), Mean Balanced Relative Error (MBRE), and Mean Inverted Balanced Relative Error (MIBRE).

(1) Mean Absolute Error (MAE)

$$MAE = \frac{1}{n} \sum_{i=1}^{n} |Y_i - \hat{Y}_i|$$

Where:

- Y_i = value current
- $\hat{Y}_i$ = value prediction system
- n = number of data

(2) Mean Balanced Relative Error (MBRE)

$$MBRE = \frac{1}{n}\sum_{i=1}^{n}\frac{|Y_i - \hat{Y}_i|}{\min(Y_i, \hat{Y}_i)}$$

s

(3) Mean Inverted Balanced Relative Error (MIBRE)

$$MIBRE = \frac{1}{n}\sum_{i=1}^{n}\frac{|Y_i - \hat{Y}_i|}{\max(Y_i, \hat{Y}_i)}$$

Third metric This used For evaluate level error system in count transaction rental compared to with previous manual recording . The higher MAE, MBRE, and MIBRE values small show level accuracy more systems Good .

With approach methodological this , the system developed No only functioning as tool digitalization , but also can measured its performance in a way quantitative in increase accuracy and efficiency of the rental process hiking/camping equipment .

3. Results and Discussion

3.1 Dataset Description

Research dataset obtained from recording transaction rental at the previous Let 's Climb Garut Shop done manually . The data is then digitized For needs implementation and testing system .

Characteristics :

- Amount transactions : 120 transactions
- Amount type Items : 12 outdoor items (tent , carrier, sleeping bag, etc.)
- period : 1 period operational
- Attribute main :
    a. Item Price
    b. Quantity
    c. Rental Duration
    d. Total Cost (manual vs system)
    e. Stock Status

Data is shared use 80:20 split method :

- 96 data for configuration and validation system
- 24 data for testing end

Table 1. Dataset Summary

Parameter	Value
Total Transactions	120
Training Data (80%)	96
Testing Data (20%)	24
Number of Item Types	12
Main Variables	Price, Quantity, Duration

The dataset shows variation duration rent between 1–5 days and the amount 1–4 units of goods per transaction .

3.2 System Design

System design made For replace manual processes with system computerized Android- based integrated MySQL database.
Component main system includes :

1. Login & Authentication Module
2. Inventory Management Module
3. Transaction Module Rental
4. Stock Monitoring Module
5. Report Module

Architecture system use client-server approach , where the Android application functions as client and PHP-MySQL server as backend.

3.2.1 Context Diagram

Context diagram required For know description from system created . As for levels or *Data Flow Diagram* (DFD) level starts from the context diagram , namely explain data describes about system in a way general consisting of from a number of *external entity* (elements outside) system) that provides input to in system .

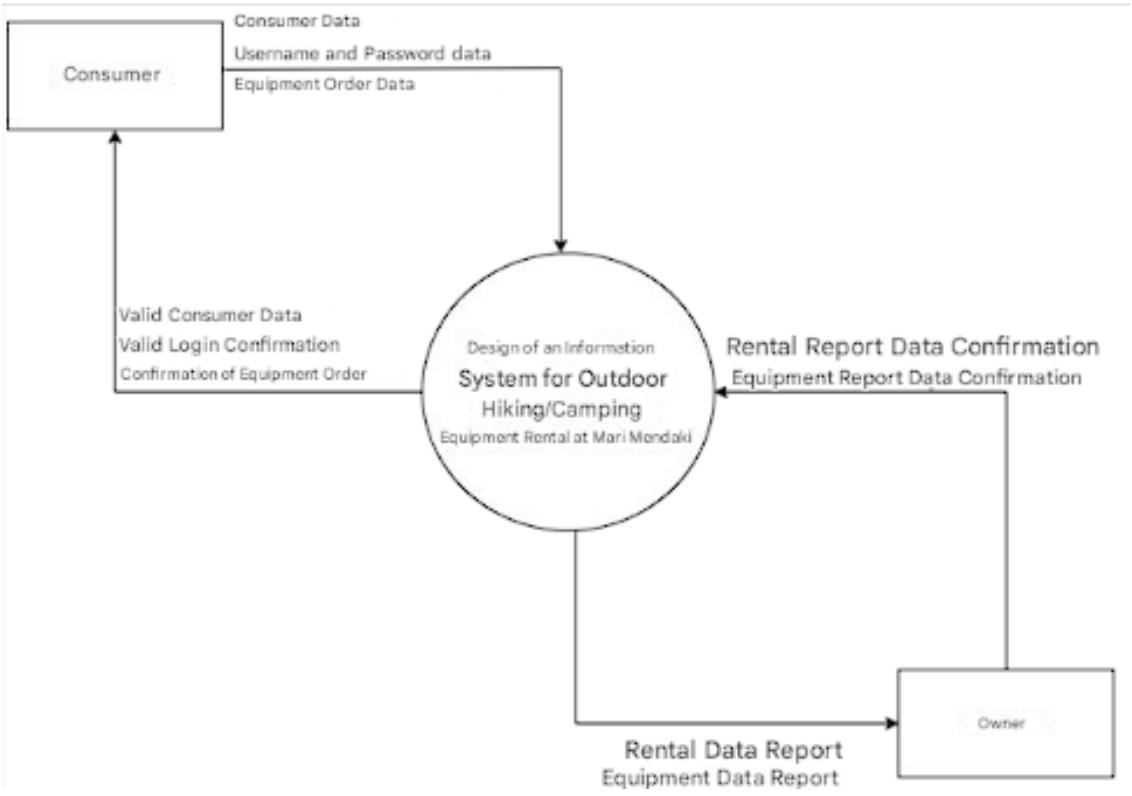

Figure 1. Context diagram system information rental tool *hiking/camp*

3.2.2 Data Flow Diagram

next step is lowering the context diagram into the more forms details again , namely with use *Data Flow Diagram* (DFD). Derivative First from the context diagram is a level 1 DFD in which there are ongoing processes too global and it is felt that a reduction process is very necessary

again , so DFD level 1 is lowered again becomes DFD level 1 process 1, and so on. until the process is felt Enough .

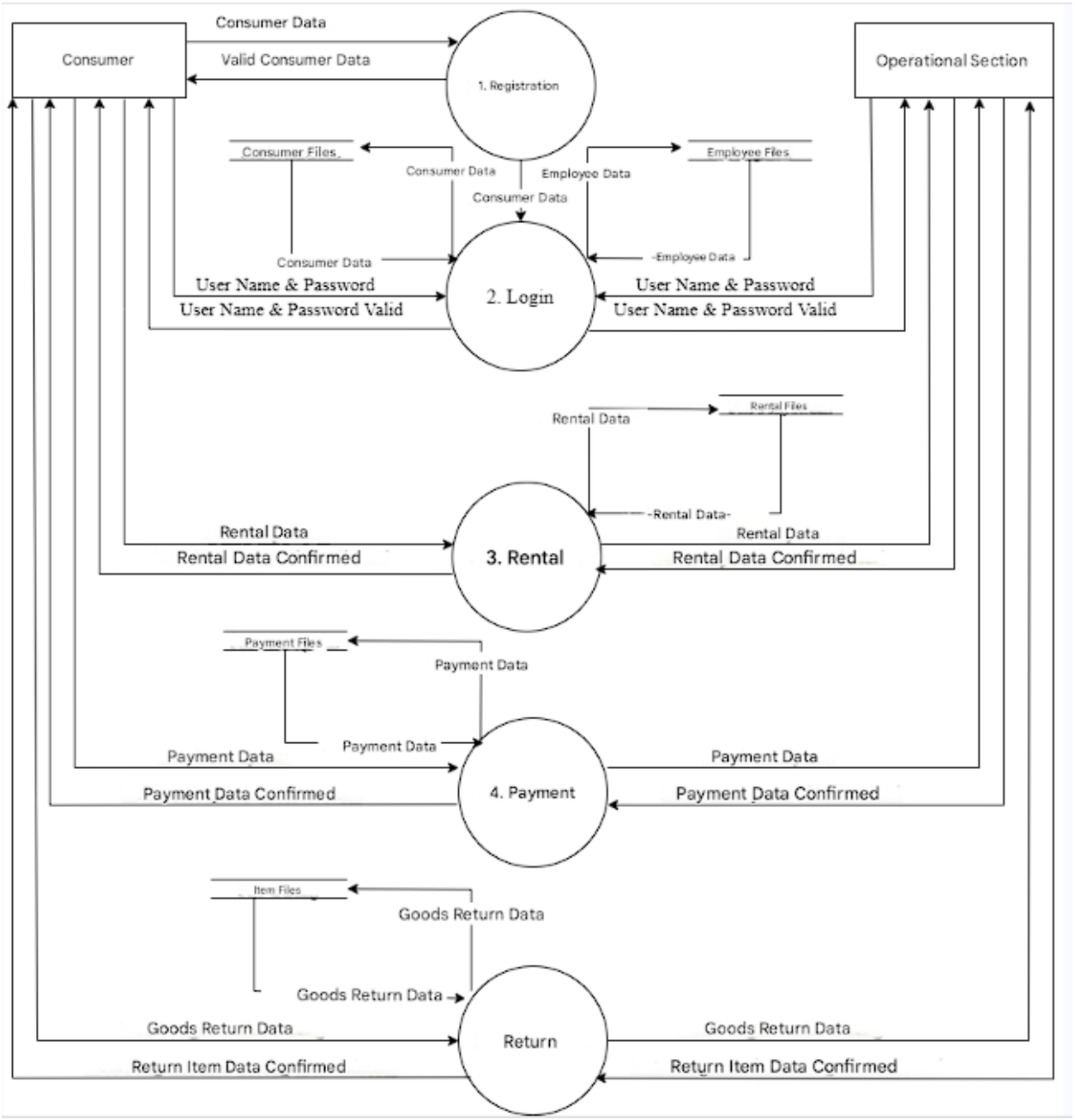

Figure 2. DFD Level 1 System information rental tool *hiking/camping outdoors* at the Let's Climb Garut shop

3.3 Implementation System

Implementation is stage coding from applications that have been designed . Implementation process the system that has been designed in advance covering the whole process in system information management rental tool *hiking/camping outdoor* will reviewed in chapter This .

1. *interface* files that have been made :

Interface files

No	Unit Name	Information
1	Index.php	Dashboard page for rental goods .
2	Index.php (Login)	Pages for limit users between admin and customer .
3	Status_sewa.php	Status page for see goods rented by customers .
4	Tenant_status.php	The overall status page of the rented item .
5	List.php	Pages for users new
6	Add_items.php	Pages for add items to be rented .
7	Profile.php	Pages for view personal data .
8	User.php	Pages for see all over users application .

2. List of Implemented Program Displays

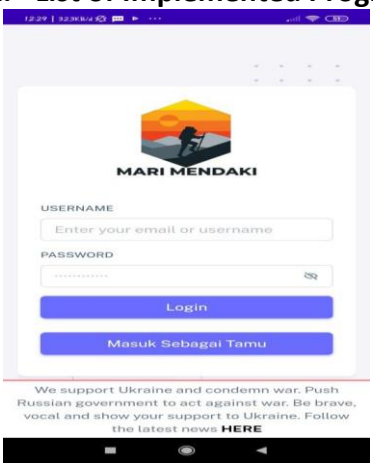

Figure 3. Display Account *Login*

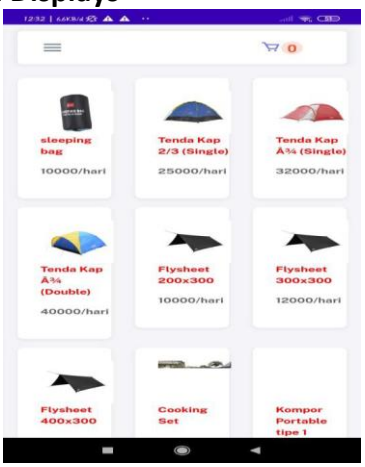

Figure 4. *Admin* and Customer Main Page Display

Figure 5. *Home Admin* Menu Display

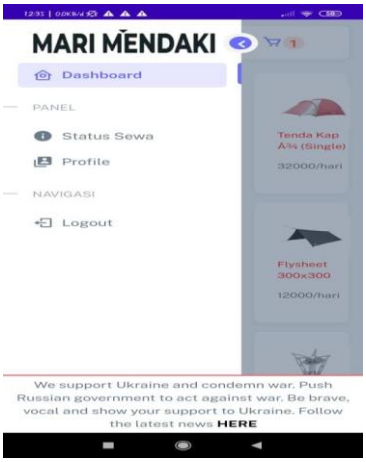

Figure 6. Customer *Home* Menu Display

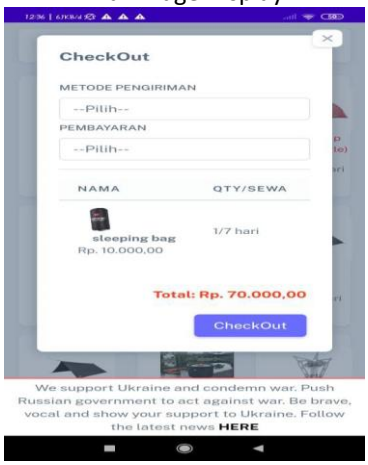

Figure 7. *Checkout* Menu Display

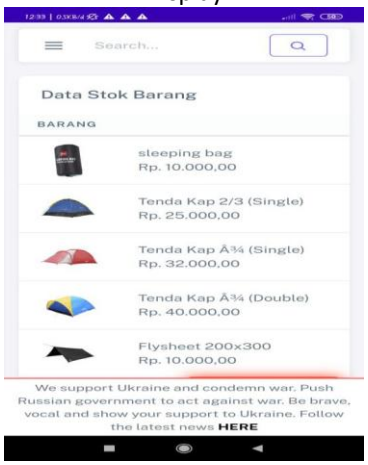

Figure 8. Display of the Stock Data Menu

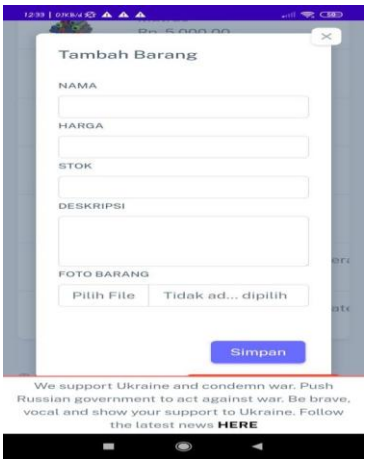

Figure 9. Display of the Add Stock Data Menu

Figure 10. Rental Status Menu Display

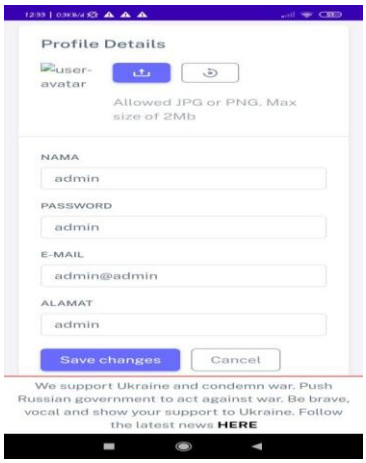

Figure 11. Profile View

Figure 12. Fines Menu Display

Figure 13. Equipment Rental Menu Display

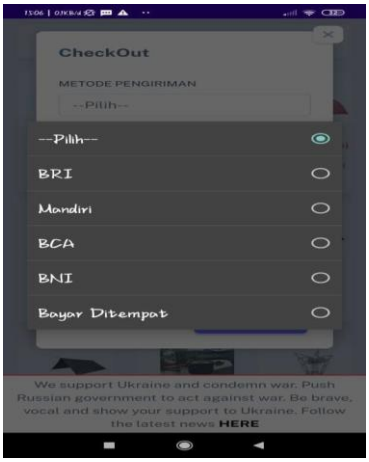

Figure 14. Payment Menu

3.4 Discussion

This result consistent with theory system information stating that database integration and process automation can reduce human error. Compared study previously only focus on digitalization recording , research This show integration full between :

- Registration module
- Rental module
- Payment module
- Stock module
- Reporting module

Superiority main system lies on:

- Calculation automatic based on mathematical formulas
- Validation availability stock before transaction
- Centralized data recording in the database

With Thus , research This No only succeed build system application , but also prove in a way quantitative that system the increase accuracy and efficiency compared to previous manual method .

4. Conclusion

Study This aim For design and implement system information rental Android- based hiking/camping tool to replace system manual recording used previously . Based on results design , implementation , and testing system , can concluded a number of matter as following .

First , the system developed succeed integrate module management goods , transactions rental , stock monitoring , and reporting in one centralized platform client–server based . This integration enable operational processes walk more systematic , structured , and documented digitally .

Second , from aspect performance computing , systems show level very high accuracy . Based on results evaluation using Mean Absolute Error (MAE), the system Android based produces mark error of 0.00 for both training and testing data. These results show that total cost calculation rentals using deterministic formulas capable remove error previous arithmetic often occurs in manual systems .

Third , implementation system give impact significant to efficiency operational . Recording process transaction become more fast , validation availability stock done in a way automatic , and report can produced in real-time. This is increase transparency transaction at a time minimize risk data loss and errors recording .

Fourth , in general conceptual study This prove that digitalization of business processes in business service scale local No only increase efficiency , but also increase reliability , accuracy , and integrity of data. System designed information capable functioning as tool supporters decision support in management rental.

Although Thus , research This Still own limitations . The system developed Still focus on calculations deterministic and not yet integrate feature analytic advanced like prediction request , analysis trend rental , or integration digital payments . Therefore that , research furthermore can develop system with machine learning approach to predict level request goods , optimize management stock , and integrate system payment digital- based or QRIS.

In a way overall , research This succeed show that implementation system information rental Android based is solution effective in increase accuracy , efficiency , and quality management operational in business rental hiking/camping equipment . Implementation system This worthy For replicated in business service similar with characteristics comparable operations.

Reference

[1] Budiman, I., Saori, S., Anwar, R. N., Fitriani, F., & Pangestu, M. Y. (2021). Analisis Pengendalian Mutu Di Bidang Industri Makanan (Studi Kasus: Umkm Mochi Kaswari Lampion Kota Sukabumi). Jurnal Inovasi Penelitian, 1(10), 2185-2190.

[2] Cahyadi, R., & Yulianeu, A. (2018). Sistem Pengambilan keputusan Pencairan Kredit Dengan Metode Scoring System Pada Koperasi Mukti Resik Kota Tasikmalaya. Jurnal Manajemen dan Teknik Informatika (JUMANTAKA), 1(1).

[3] Fahrudin, R. (2014). Sistem Informasi Penyewaan Alat Outdoor Di Warger Camping Equipment. J. Progr. Stud. Sist. Informasi, Univ. Komput. Indonesia.

[4] Muharditya, P., Dhika, H., & Pratiwi, N. K. (2020). Sistem Informasi Penyewaan Alat Outdoor di Rinjani Adventure. Jurnal Riset dan Aplikasi Mahasiswa Informatika (JRAMI), 1(03).

[5] Nugraha, F. (2019)). Sistem Informasi Penyewaan Alat Outdoor Di Malindo Kota Tasikmalaya Berbasis Web. Jurnal Manajemen dan Teknik Informatika (JUMANTAKA), 2(1).

[6] NURCHAENI, S. (2017). SISTEM INFORMASI PENYEWAAN ALAT-ALAT OUTDOOR BERBASIS WEB PADA SINDORO OUTDOOR RENTAL (Doctoral dissertation, Fakultas Teknologi Industri UNISSULA).

[7] Solichin, A. (2016). Pemrograman web dengan PHP dan MySQL. Penerbit Budi Luhur.

[8] Tim, E. M. S. (2015). *Pemrograman Android dalam Sehari*. Elex Media Komputindo.

[9] Wahyono, T. (2004). Sistem Informasi. *Yogyakarta: Graha Ilmu*

[10] Yulianeu, A. (2017). Aplikasi perhitungan stok barang di waserda koperasi unit desa minarasa batukaras dengan menggunakan metode average. JUTEKIN (Jurnal Teknik Informatika), 1(2).