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Design and Development of an Android-Based Inpatient Room Availability Application for Sinar Husni Hospital

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Abstract

For every patient requiring inpatient care, Sinar Husni Hospital provides inpatient rooms in various classes. Sinar Husni Hospital also accepts medical and inpatient services through the Social Security Agency (BPJS). A problem is that inpatient rooms at Sinar Husni Hospital are often unavailable due to the large number of people requiring inpatient care and limited space. This is discovered after people arrive for treatment and the hospital informs them of available inpatient rooms, ultimately resulting in patients being referred to other nearby hospitals. Therefore, a method is needed for Sinar Husni Hospital to provide information to the public regarding inpatient room availability and for the public to receive information about the availability of inpatient rooms at Sinar Husni Hospital. The researcher's solution involves using computers and Android devices using the K-NN method to recommend inpatient rooms for patients. This research also aims to create an application that can manage inpatient room data and disseminate information about inpatient room availability to the public, allowing them to determine the availability of inpatient rooms. KNN can determine rooms that meet patient needs and desired facilities. The application consists of two users: the first, an administrator via a web server, who manages inpatient room data, and the second, a member of the public, who receives inpatient room availability information via an Android device.

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1. Introduction

Hospitals are vital healthcare facilities in the public health system. One of the challenges frequently faced by patients and their families is the difficulty in obtaining timely and accurate information about inpatient room availability. At Sinar Husni Hospital, information about inpatient rooms is still generally obtained through direct communication, either by telephone or verbally on-site, which often leads to illness and inefficiencies in the service process (Sudarmadji & Pratama, 2020).

In today's digital era, the use of information technology plays a crucial role in improving the efficiency of healthcare services. The development of mobile technology, particularly the Android platform, presents a significant opportunity to build information systems that are easily accessible to the public. With an Android-based application, patients can obtain real-time information about inpatient room availability without having to visit the hospital or contact the administration.

This research topic concerns inpatient care at Sinar Husni General Hospital. The inpatient ward is a clinical service unit that serves patients whose conditions prevent them from receiving care at home. Inpatient care is provided to patients requiring observation, diagnosis, therapy, or rehabilitation, who require an overnight stay and use a bed, and receive continuous nursing care. (Putri & Sonia, 2021). The research location was Sinar Husni General Hospital. Sinar Husni General Hospital is a private hospital responsible for providing health services through healing, recovery, improvement, prevention, referral services, and community service. For every patient requiring inpatient care, Sinar Husni General Hospital provides inpatient rooms in various classes. Sinar Husni General Hospital also accepts medical and inpatient services through the Social Security Agency (BPJS).

The problem is that inpatient rooms at Sinar Husni Hospital are often unavailable due to the large number of people requiring hospitalization and limited space. This is discovered after people arrive for treatment and the hospital informs them of available rooms, ultimately leading to patients being referred to other nearby hospitals. Therefore, a method is needed for Sinar Husni Hospital to provide information to the public regarding inpatient room availability and for the public to receive information about inpatient room availability at Sinar Husni Hospital.

The researchers' solution involves using computers and Android devices to create an application that manages inpatient room data and disseminates information to the public, allowing them to determine room availability. The application consists of two users: the administrator, via a web server, who manages inpatient room data, and the member of the public, via an Android device, who receives information about inpatient room availability.

In addition, the application of the K-Nearest Neighbor (KNN) method aims to provide inpatient room recommendation features based on patient data history and available room characteristics. KNN is one of the algorithms in machine learning that can be used for classification and prediction, and in this context, KNN is used to help determine the most appropriate inpatient room based on available data, such as gender, treatment class, and patient special needs. With this application, it is hoped that the process of searching and booking inpatient rooms can be done more quickly, efficiently, and accurately, and can help hospitals in managing room data more systematically.

2. Research Methodolgy

A method is a systematic way to address a problem. This research will involve several stages. These stages can be modeled using a fishbone diagram. Data collection was conducted at the research site using the following stages and steps:

1. Field Research

The researcher visited Sinar Husni Hospital to obtain the data needed for this study.

2. Interviews

The researcher interviewed Mrs. Halimah, the receptionist, to obtain any unclear data. The following questions were asked:

a. How is the inpatient room recommendation process at Sinar Husni Hospital?
b. What are the challenges encountered in reserving inpatient rooms at Sinar Husni Hospital?
c. Is it easier for patients to find information about inpatient room availability at Sinar Husni Hospital?

3. Samples

At this stage, the researcher collected several research samples useful for this research.

4. Literature Review

At this stage, the researcher used journals as references and a theoretical basis for this research.

The K-Nearest Neighbor (KNN) algorithm is a method for classifying objects based on learning data that is closest to the object. Nearest neighbor is an approach to finding cases by calculating the proximity between a new case and previous cases that have similar values and weights. (Eva Yulianti & Yondi Andri Nurdin, 2020).

The goal of the K-NN algorithm is to classify new objects based on attributes and training samples. The results of new test samples are classified based on the majority of the categories in the

K-NN algorithm. In the classification process, this algorithm does not use any matching models and relies solely on memory.

According to Luh Made Yulyantari, S.Kom., M.Pd & IGKG Puritan Wijaya ADH, S.Kom., MMSI 2020, the principle of K-NN is to find the shortest distance between the data to be evaluated and its K nearest neighbors in the training data. Based on the KNN algorithm, the calculation can be done as follows:

1. Determine the value of K, for example, K = 5.
2. Calculate the distance between each data sample and the data to be tested.
3. The data is sorted by distance.
4. If K = 5 is set, the five shortest distances are taken.
5. Final assessment.

The K-Nearest Neighbor (KNN) method is a method for classifying objects based on learning data that is closest to the object. This technique is very simple and easy to implement. Similar to clustering techniques, it groups new data based on the distance of the new data to several data/neighbors. First, before finding the distance of data to neighbors, determine the value of K neighbors. Then, to define the distance between two points, namely points in the community data and points in the testing data, the Euclidean formula is used with the following equation:

$$d(x,y) = \sum_{i=1}^{n} (xi - yi)^2 \quad (1)$$

Description:
d (a,b): Euclidean distance
x: data 1
y: data 2
i: feature -
n: number of features ((Eva Yulianti & Yondi Andri Nurdin, 2020).

3. Results and Discussion

The following is data obtained from Sinar Husni Hospital regarding rooms and facilities:

Table 1. Rooms at Sinar Husni Hospital

No	Room	Class	Facility
1	VIP Carnation Rooms 1 to 13	1	➢ 1 Bed ➢ 1 TV ➢ 1 Air Conditioner ➢ 1 Water Dispenser ➢ 1 Bathroom
2	Catelia Rooms 1 to 6	2	➢ 2 Bed ➢ 1 TV ➢ 1 AC ➢ 1 Dispenser ➢ 1 Bathroom
3	Catelia Rooms 7 and 8	2	➢ 3 Bed ➢ 1 TV ➢ 1 AC ➢ 1 Bathroom
4	Cempaka Rooms 1 to 7	3	➢ 3 Bed ➢ 1 TV

5	Tulip Rooms 1 to 6	3	➢ 1 AC ➢ 1 Bathroom ➢ 3 Bed 1 TV
6	Acacia Rooms 1 to 6	3	➢ 1 AC ➢ 1 Bathroom ➢ 3 Bed ➢ 1 TV ➢ 1 AC ➢ 1 Bathroom

The following is the criteria data in the Android-based Sinar Husni Hospital Inpatient Room Availability Application, as follows:

Table 2. Criteria Assessment Data

No.	Nama	Subkriteria	Bobot
1	Facility	Complete facilities (AC, private bathroom, AC, TV, Wi-Fi)	3
		Moderate facilities (2-3 items available)	2
		Basic facilities only	1
2	Room Cleanliness	Very clean and comfortable (with a survey score >= 90)	3
		Quite clean (survey score 70-89)	2
		Needs special attention (survey score <70)	1
3	Cost Per Day	Rp500.000 per day (expensive)	3
		Rp300.000 - Rp500.000 (moderate)	2
		< Rp300.000 per day (cheap)	1
4	Distance from ER	< 50 meter (very close)	3
		50-100 meter (moderate)	2
		100 meter (far)	1
5	Availability of Medical Personnel	Ideal ratio (1 nurse for <= 5 patients)	3
		Sufficient (1 nurse for 6-8 patients)	2
		Insufficient (1 nurse for >8 patients)	1

The training data was then subjected to a data transformation process, as seen in the following table:

Table 3.Training Data Transformation Results

No.	Name	Facility	Room Cleanliness	Cost Per Day	Distance from ER	Availability of Medical Personnel	Room
1	Harjaya Siregar	3	1	2	1	3	Cempaka
2	Faizah Laksmiwati S.Kom	1	2	2	3	1	Akasia
3	Rafi Latupono	3	1	1	3	2	Tulip
4	Irma Zaenab Permata	2	2	1	1	3	Akasia
5	Cawisadi Jayeng Tamba	1	1	3	1	2	Akasia
6	Zaenab Wijayanti	1	2	3	3	1	Cempaka
7	Prabu Januar	2	3	1	2	1	Akasia
8	Zelda Namaga	2	1	2	2	3	Akasia
9	Daliman Kardi Saptono	3	3	2	2	1	Catelia
10	Kacung Mahendra S.Pt	2	1	2	3	3	Tulip
11	Rini Ayu Mayasari	3	1	3	2	3	Tulip
12	Maida Suryatmi	3	1	1	3	3	Catelia
13	Faizah Mala Pudjiastuti	2	2	1	2	1	Akasia
14	Jindra Maryadi	3	3	3	1	2	Cempaka

No.	Name	Facility	Room Cleanliness	Cost Per Day	Distance from ER	Availability of Medical Personnel	Room
15	Kajen Kamal Nashiruddin M.Pd	1	2	2	3	2	Akasia
16	Rina Permata	2	2	3	2	3	Cempaka
17	Cemplunk Jaswadi Setiawan	3	2	1	1	1	Akasia
18	Ajeng Anggraini S.Pt	1	2	3	3	2	Tulip
19	Agnes Namaga	3	1	2	3	3	Catelia
20	Karimah Wulandari	2	1	2	2	1	Akasia
21	Nova Tania Astuti	2	1	3	3	1	Cempaka
22	Muni Nashiruddin	3	3	3	3	1	Anyelir VIP
23	Ulya Yuliarti	2	3	3	1	1	Catelia
24	Ibrahim Wage Tampubolon M.M.	1	2	1	3	2	Akasia
25	Pardi Nainggolan	1	2	1	2	3	Akasia
180	Niyaga Megantara	3	1	1	2	1	Akasia
181	Puspa Melinda Rahmawati S.Kom	3	1	3	1	2	Cempaka
182	Lidya Widiastuti S.Farm	3	1	3	3	1	Cempaka
183	Aslijan Prayoga Januar	3	3	2	3	1	Tulip
184	Kartika Handayani	1	1	2	1	3	Akasia
185	Galang Narpati	1	1	3	1	2	Akasia
186	Dwi Najib Permadi	2	1	1	3	3	Tulip
187	Cornelia Hastuti	2	2	1	1	1	Akasia
188	Eva Ade Laksita M.TI.	1	1	2	1	3	Akasia
189	Umi Uli Andriani	1	3	3	3	2	Catelia
190	Cahyo Bakidin Firgantoro S.Psi	3	3	3	1	3	Anyelir VIP
191	Banawi Permadi M.M.	3	3	2	3	2	Cempaka
192	Nadine Zahra Kusmawati S.T.	2	3	1	2	3	Tulip
193	Maman Ramadan	2	1	3	1	1	Akasia
194	Aisyah Pratiwi	1	3	3	1	1	Tulip
195	Usman Thamrin	1	2	3	2	3	Tulip
196	Okta Rahman Ardianto	1	3	3	3	2	Cempaka

The following is the testing data in the Android-based Sinar Husni Hospital Inpatient Room Availability Application, as follows:

Tabel 4. Data Testing

Name	Facility	Room Cleanliness	Cost Per Day	Distance from ER	Availability of Medical Personnel
Tono Abdullah	Fasilitas sedang (2-3 item tersedia)	Sangat bersih dan nyaman (dengan nilai survei >= 90)	Rp500.000 per hari (mahal)	< 50 meter (sangat dekat)	Rasio ideal (1 perawat untuk <= 5 pasien)
	2	3	3	3	3

The following is the implementation of the KNN method in recommendations for the availability of inpatient care at Sinar Husni Hospital:

A. Determining the Euclidean Distance to the training data:

1. $= \sqrt{(3-2)^2 + (1-3)^2 + (2-3)^2 + (1-3)^2 + (3-3)^2} = 3.162$

2. $= \sqrt{(1-2)^2 + (2-3)^2 + (2-3)^2 + (3-3)^2 + (1-3)^2} = 2.645$
3. $= \sqrt{(3-2)^2 + (1-3)^2 + (1-3)^2 + (2-3)^2 + (1-3)^2} = 3.162$
4. $= \sqrt{(2-2)^2 + (2-3)^2 + (1-3)^2 + (1-3)^2 + (3-3)^2} = 3$
5. $= \sqrt{(1-2)^2 + (1-3)^2 + (3-3)^2 + (1-3)^2 + (2-3)^2} = 3.162$
6. $= \sqrt{(1-2)^2 + (2-3)^2 + (3-3)^2 + (3-3)^2 + (1-3)^2} = 2.449$
7. $= \sqrt{(2-2)^2 + (3-3)^2 + (1-3)^2 + (2-3)^2 + (1-3)^2} = 3$
8. $= \sqrt{(2-2)^2 + (1-3)^2 + (2-3)^2 + (2-3)^2 + (3-3)^2} = 2.449$
9. $= \sqrt{(3-2)^2 + (3-3)^2 + (2-3)^2 + (2-3)^2 + (1-3)^2} = 2.4645$
10. $= \sqrt{(2-2)^2 + (1-3)^2 + (2-3)^2 + (3-3)^2 + (3-3)^2} = 2.236$ etc

The results of the calculation of the Euclidean distance from the training data can be seen in the following data:

Table 5. Results of Euclidean Distance Calculation

No	Facility	Room Cleanliness	Cost Per Day	Distance from ER	Availability of Medical Personnel	Total	Distance	Room
1	1	4	1	4	0	10	3,162278	Cempaka
2	1	1	1	0	4	7	2,645751	Akasia
3	1	4	4	0	1	10	3,162278	Tulip
4	0	1	4	4	0	9	3	Akasia
5	1	4	0	4	1	10	3,162278	Akasia
6	1	1	0	0	4	6	2,44949	Cempaka
7	0	0	4	1	4	9	3	Akasia
8	0	4	1	1	0	6	2,44949	Akasia
9	1	0	1	1	4	7	2,645751	Catelia
10	0	4	1	0	0	5	2,236068	Tulip
11	1	4	0	1	0	6	2,44949	Tulip
12	1	4	4	0	0	9	3	Catelia
13	0	1	4	1	4	10	3,162278	Akasia
14	1	0	0	4	1	6	2,44949	Cempaka
15	1	1	1	0	1	4	2	Akasia
16	0	1	0	1	0	2	1,414214	Cempaka
17	1	1	4	4	4	14	3,741657	Akasia
18	1	1	0	0	1	3	1,732051	Tulip
19	1	4	1	0	0	6	2,44949	Catelia
20	0	4	1	1	4	10	3,162278	Akasia
...								
190	1	0	0	4	0	5	2,236068	Anyelir VIP
191	1	0	1	0	1	3	1,732051	Cempaka
192	0	0	4	1	0	5	2,236068	Tulip
193	0	4	0	4	4	12	3,464102	Akasia
194	1	0	0	4	4	9	3	Tulip
195	1	1	0	1	0	3	1,732051	Tulip
196	1	0	0	0	1	2	1,414214	Cempaka

From the table above, the results are then sorted in ascending order (from the smallest to the largest distance). The results can be seen in the following table:

Table 6. Ascending Results

No	Facility	Room Cleanliness	Cost Per Day	Distance from ER	Availability of Medical Personnel	Room	Total	Distance
63	0	0	0	0	0	Anyelir VIP	0	0
171	0	0	0	0	0	Anyelir VIP	0	0
34	1	0	0	0	0	Anyelir VIP	1	1
84	0	0	0	0	1	Cempaka	1	1
119	0	1	0	0	0	Cempaka	1	1
144	1	0	0	0	0	Anyelir VIP	1	1
16	0	1	0	1	0	Cempaka	2	1,414214
30	1	0	1	0	0	Cempaka	2	1,414214
48	1	0	0	0	1	Tulip	2	1,414214
59	1	1	0	0	0	Anyelir VIP	2	1,414214
60	1	0	1	0	0	Anyelir VIP	2	1,414214
82	1	0	0	1	0	Catelia	2	1,414214
180	1	4	4	1	4	Akasia	14	3,741657
38	0	4	4	4	4	Akasia	16	4
112	0	4	4	4	4	Akasia	16	4
145	0	4	4	4	4	Akasia	16	4
75	1	4	4	4	4	Akasia	17	4,123106
172	1	4	4	4	4	Akasia	17	4,123106

From the table above, it can be seen that the recommended room is Anyelir VIP.

Evaluasi Model

The following is the testing data that will be evaluated:

No.	Name	Data Aktual	Result KNN
1	Tono Abullah	Anyelir VIP	Anyelir VIP
2	Alex Naibaho	Akasia	Tulip
3	Dhimas Anggara	Cempaka	Cempaka
4	Mhd Yusuf	Catelia	Catelia
5	Mhd Nazar	Tulip	Tulip

From the table above, it is then made into a matrix form as follows:

Actual \ Predicted	Anyelir VIP	Akasia	Tulip	Cempaka	Catelia
Anyelir VIP	1 (TP)	0	0	0	0
Akasia	0	0	1 (FN)	0	0
Cempaka	0	0	0	1 (TP)	0
Catelia	0	0	0	0	1 (TP)
Tulip	0	0	1 (TP)	0	0

The model evaluation table can be found in the following table Confusion Matrix

Confusion Matrix		Nilai aktual	
		Positif	Negatif
Nilai Prediksi	Positif	4	0
	Negatif	1	0
Amount		5	0
Total			5

The purpose of a confusion matrix is to visualize the predictions and actual state of data generated by a machine learning algorithm. This is done by calculating accuracy, precision, recall, and F1-score. These metrics are crucial in evaluating the performance of classification or machine learning algorithms used to make predictions. The formulas for these four metrics are shown in the following table:

Akurasi ==$\frac{TP+TN}{TP+FP+FN+TN}$ = $\frac{4+0}{4+0+1+0}$ = $\frac{4}{5}$ = 0.80 = 80%

Precision = $\frac{4}{4+0}$ = 100%

Recall =$\frac{4}{4+1}$ = 0.80 = 80%

F1-Score =$\frac{2x0.80x\ 1}{0.80+1}$ = 1.6 /1.80 = 0.89 = 89%

4. Conclusion

This study successfully designed and developed an Android-based inpatient room availability application for Sinar Husni Hospital. The main finding of this research is that the application can display real-time information on room availability and assist users—both hospital staff and patients—in accessing this information efficiently. The integration of the K-Nearest Neighbors (KNN) method proved effective for classifying room types based on multiple criteria, including available facilities, room cleanliness, daily cost, proximity to the emergency room, and medical staff availability. Experimental results on five patient data sets showed an accuracy of 80%, precision of 100%, recall of 80%, and an F1-score of 89%, indicating that the KNN model performs well in initial classification but still offers potential for further optimization. Additionally, the user interface design was validated as user-friendly, facilitating data entry for staff and enabling patients to obtain updated information remotely. For future research, it is recommended to explore hybrid or ensemble machine learning approaches to improve classification accuracy and robustness. Expanding the dataset and integrating real-time sensor data or hospital database systems could also enhance model performance and application scalability. Further usability testing with larger user groups is also suggested to refine the system's interface and ensure higher user satisfaction.

References

Adiasa, I., Hudaningsih, N., Wasir Riski, I., & Ruskartina, E. (2022). Analisis Potensi Bahaya Pada Pekerjaan Drainase Pada Proyek Pengendalian Banjir Di PT. Brantas Abipraya (Persero) Menggunakan Metode Hazard Identification and Risk Assessment (HIRA). *Jurnal Industri & Teknologi Samawa*, *3*(2), 80–91. https://doi.org/10.36761/jitsa.v3i2.1966

Aditya Fajar Ramadhan, Ade Dwi Putra, & Ade Surahman. (2021). Aplikasi Pengenalan Perangkat Keras Komputer Berbasis Android Menggunakanaugmented Reality (Ar). *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, *2*(2), 24–31. http://jim.teknokrat.ac.id/index.php/JTSI

Arianto, A., Amalia, D. R., Dana, R. D., Ajiz, A., & Hamonangan, R. (2022). Rancang Bangun Aplikasi Persediaan Barang pada Toko Endo Tani. *MEANS (Media Informasi Analisa Dan Sistem)*, *7*(1), 48–56. https://doi.org/10.54367/means.v7i1.1905

Arianto Pradana, A. P., & Ibnu Hardi, I. H. (2021). Sistem Informasi Alat Kesehatan Berbasis Web.

Jurnal Ilmiah Sistem Informasi, *1*(1), 14–21. https://doi.org/10.51903/juisi.v1i1.257

Arindra Putawa, R., Aqidah, M., Islam, F., Sunan, U., & Yogyakarta, K. (2022). Makna Filosofis Ketiadaan dan Relevansinya dengan Tipe Data Undefined pada Javascript. *Jurnal Filsafat Indonesia*, *5*(1), 80–86.

Atmaja, N. S. (2022). Sistem Pakar Diagnosa Penyakit Irritable Bowel Syndrome (IBS) Menggunakan Metode Teorema Bayes. *RJOCS (Riau Journal of Computer Science)*, *8*(01), 33–41. https://doi.org/10.30606/rjocs.v8i01.1188

Budiyanto, A. (2023). *Perancangan Aplikasi Pembukuan Keuangan Warung Sembako Jakarta Timur Berbasis Manajemen Keuangan dengan Android*. *7*(1), 90–94.

Haryanti, S. (2023). *Jurnal Vokasi Indonesia PENYUSUTAN ARSIP REKAM MEDIS DI RUMAH SAKIT : STUDI KASUS RUMAH SAKIT VERTIKAL KEMENKES*. *10*(2). https://doi.org/10.7454/jvi.v10i2.1016

Ilman, R., Indriani, S., & Adriantantri, E. (2020). *METODE SERVICE QUALITY (Studi Kasus Tabungan Amanah BANK BPR Syariah Kota Mojokerto)*. *3*(2), 86–92.

Kasus, S., Davin, C. V, Karimun, J., Fersiartha, K. D., & Yuliana, I. (2020). *Jurnal cafetaria*. *1*(2), 33–44.

Kholik, N., & Adhiwibowo, W. (2022). Sistem Informasi Perpustakaan Berbasis Web Kabupaten Demak. *Information Science and Library*, *3*(1), 41. https://doi.org/10.26623/jisl.v3i1.5106

Kuswanto, J. (2020). Media Pembelajaran Berbasis Android Mata Pelajaran Desain Grafis Kelas X. *Edutic - Scientific Journal of Informatics Education*, *6*(2), 78–84. https://doi.org/10.21107/edutic.v6i2.7073

Nizar, C. (2021). Rancang Bangun Sistem Informasi Sewa Rumah Kost (E-Kost) Berbasis Website. *Jurnal Sistem Informasi Dan Sains Teknologi*, *3*(1), 1–10. https://doi.org/10.31326/sistek.v3i1.852

Praguna, A. A., & Nugroho, A. C. (2021). Rancang Bangun Aplikasi Persediaan Obat Pada Apotik Anugrah Medika Kotabumi Lampung Utara. *Teknologi Terkini*, *1*(2), 1–14. http://teknologiterkini.org/index.php/terkini/article/view/34

Prahasti, P., Sapri, S., & Utami, F. H. (2022). Aplikasi Pelayanan Antrian Pasien Menggunakan Metode FCFS Menggunakan PHP dan MySQL. *Jurnal Media Infotama*, *18*(1), 341139.

Putri, A. K., & Sonia, D. (2021). *2) 1,2*. *2*(3).

Rahmat Gunawan, Arif Maulana Yusuf, & Lysa Nopitasari. (2021). Rancang Bangun Sistem Presensi Mahasiswa Dengan Menggunakan Qr Code Berbasis Android. *Elkom : Jurnal Elektronika Dan Komputer*, *14*(1), 47–58. https://doi.org/10.51903/elkom.v14i1.369

Sapriyanto, E., Kusmindari, D., & Hardini, S. (2020). Pengukuran Tingkat Kepuasan Pelanggan Terhadap Servis Ringan Sepeda Motor Dengan Metode Service Quality. *Bina Darma Conference on Engineering Science (BDCES)*, *2*(1), 417–441.

Sari, I. P., Azzahrah, A., Qathrunada, I. F., Lubis, N., & Anggraini, T. (2022). Perancangan Sistem Absensi Pegawai Kantoran Secara Online pada Website Berbasis HTML dan CSS. *Blend Sains Jurnal Teknik*, *1*(1), 8–15. https://doi.org/10.56211/blendsains.v1i1.66

Sihombing, V., & Yanris, G. J. (2020). Penerapan Aplikasi Dalam Mengolah Aset Desa (Studi Kasus : Kepenghuluan Sri Kayangan) 1). *Terakreditasi DIKTI*, *4*(1), 12–15.

Simbolon, J., & Sipayung, S. D. (2022). *Analisis Kualitas Pengelolaan Mutu Pelayanan Pendaftaran Pasien di Instalasi Rawat Inap Rumah Sakit Santa Elisabeth Medan*. *1*(4), 591–599. https://doi.org/10.55123/sehatmas.v1i4.937

Siregar, S. A., & Indonesia, P. P. (2021). *TERHADAP PENGENDALIAN INTERNAL PERSEDIAAN PADA PT*. *2*, 54–64.

Sitanggang Rianto, Urian Dachi Teddy, & Manurung H G Immanuel. (2022). Rancang Bangun Sistem Penjualan Tanaman Hiasberbasis Web Menggunakan Php Dan Mysql. *Tekesnos*, *4*(1), 84–90.

Yandi, J., & Wijaya, K. (2023). Rancang Bangun Aplikasi Persediaan Barang Pada Counter Karya Cellmenggunakan Vb Net. *JSK (Jurnal Sistem Informasi Dan Komputerisasi Akuntansi)*, *7*(1), 1–6. https://doi.org/10.56291/jsk.v7i1.109

Yuntari Purba Sari. (2017). Rancang Bangun Aplikasi Penjualan Dan Persediaan Obat Pada Apotek Merben Di Kota Prabumulih. *Jurnal Sistem Informasi Dan Komputerisasi Akuntansi (Jsk)*, *1*(1), 81–

88.
Zaen, M. T. A., Yuliadi, Y., Sofya, N. D., & Faruq, H. M. R. Al. (2021). Rancang Bangun Aplikasi Inventory Barang Pada Tempat Food and Drink Berbasis Android. *JURIKOM (Jurnal Riset Komputer)*, *8*(3), 99–107. https://doi.org/10.30865/jurikom.v8i3.3560