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WEB Based Social Assistance Recipient Selection Application Based on Community Education Level With C4.5 Algorithm

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Abstract

The Koramil 1408-02 Tallo office is responsible for distributing social assistance to recipients, including basic food assistance for the general community and support for micro, small, and medium enterprises (MSMEs). Each type of assistance has distinct criteria for determining eligibility, including educational level, which complicates the selection process for the staff. To address these challenges, this study leverages data mining techniques to develop a classification system using the C4.5 algorithm, aimed at determining social assistance recipients more effectively. The primary goal of this study is to create a system that simplifies the selection process for social assistance recipients by incorporating educational levels into the decision-making criteria. The outcome of the research is an application designed to assist Koramil 1408-02 Tallo in accurately identifying eligible recipients based on predefined criteria, thus resolving inefficiencies in the existing system. This study contributes to the advancement of knowledge by showcasing the practical application of the C4.5 algorithm in the context of social welfare distribution. It not only improves the accuracy and efficiency of recipient selection but also serves as a model that can be adapted and expanded to other domains of social assistance. The findings highlight the transformative potential of data-driven decision-making tools, offering valuable insights for future research and development in optimizing resource allocation and enhancing the effectiveness of social support systems.

Keywords: Learning media; Electrical Engineering; Web Learning; Information and Communication.

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Introduction

Micro, Small and Medium Enterprises (MSME) refers to productive economic businesses owned by individuals or business entities according to established standards. The system for receiving social assistance (MSMEs and basic necessities) for the poor, education level status or low income is one form of effort. to reduce the burden of food expenditure from poor families (Pramono et al., 2021). With the existence of social assistance for the poor, it is expected to have a direct impact on improving the welfare and food security of poor families. Social assistance or commonly abbreviated as social assistance is assistance in the form of money or goods which is usually given by the government to the community to protect recipients of social assistance from possible social risks or with the aim of improving their standard of living and social welfare (Sahela et al., 2021).

There are various types of social assistance provided by the Indonesian government to the community, here are several types of social assistance such as: Social Assistance in the Health Sector, Social Assistance in the Field of Community Empowerment, Social Assistance in the Field of Social Protection and School Operational Assistance (BOS), Apart from BOS there is also the Smart Indonesia Program given to students (Asmorowati et al., 2021). This social assistance in the field of education aims to make all Indonesians, especially from the underprivileged, receive equal education. The Public Health Insurance Program with the concept of social insurance is aimed at abandoned children, the poor and poor, homeless or people who do not have identity cards, residents of social care institutions (Yuda, 2021).

furthermore, the National Health Insurance which is intended to meet the basic needs of health and JKN is given to people who have paid contributions regularly or their dues paid by the government. Furthermore, the Social Assistance for Social Protection consists of the Family Hope Program (PKH) aims to improve the welfare of the people by requesting the involvement of social aid recipients to maintain the health and education of their children (Kurnianingsih et al., 2020). While The Direct Cash Transfer (BLT) is handed over either directly or with a transfer system or assistance

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in the form of basic necessities handed over to people in need. However, in the case of the field, the decision-making to determine the criteria for receiving social assistance (MSMEs and basic necessities) is usually not well targeted, resulting in the distribution of social assistance sometimes not referring to the criteria for poor families (Hanlon et al., 2012).

People who receive MSMEs are people who have micro businesses and earn more than five hundred thousand rupiahs, while people who receive basic necessities are poor people who have uninhabitable houses, do not have vehicles, education level, and earn below one million five hundred thousand rupiahs (Widjaja, 2012). The distribution of social assistance has not yet implemented a system that complies with these criteria. The system applied is the collection of data on recipients of social assistance which only refers to recommendations from local RT/RW. However, it does not refer to criteria that are in accordance with real conditions in the field (Amilia & Tuti, 2021). SMEs and basic necessities) that were distributed were not on target. This means that there are a number of community members who still receive assistance, even though economically they are classified as well-off families (not poor families) who receive the assistance.

The need for an improvement in the social assistance distribution system, which has been facing problems, has arisen. Algorithm C4.5 is an algorithm used to form a decision tree (Decision Tree). Decision trees are a method of classification and prediction. This algorithm is a decision tree classification algorithm that is widely used because it has the main advantages of other algorithms (Sajja et al., 2021). The advantages of the C4.5 algorithm can produce a decision tree that is easy to interpret, has an acceptable level of accuracy, is efficient in handling discrete and numeric type attributes (Yendrizal, 2021). Therefore, with the problem of inappropriate social assistance (MSME and basic necessities), this study uses data mining techniques that utilize existing data to analyze based on attributes with the C4.5 algorithm. The C4.5 algorithm has been widely used in classifying social assistance for delivery problems that do not meet the criteria, so using the C4.5 algorithm can help produce more accurate and effective data. Based on these problems, the authors made a study entitled "Implementation of the C4.5 Algorithm in Web-Based Social Assistance Recipient Selection Applications". It is hoped that this effort can produce a good accuracy value.

Methods

The location of the research was carried out at the Koramil Office 1408-02/Tallo having its address at Jalan Kaluku Bodoa, Kec. Tallo, Makassar City, South Sulawesi 90212. This type of research is research that must design a system to assist the community in making social assistance decisions based on community education. This research requires a fact to add and refine existing research, regarding a problem that must be studied and found a way out, then the stages of research carried out are: (a) Field Research (Field Research) Field research is research conducted by conducting a direct survey at the Koramil Office 1408-02/Tallo. (2) Research Library (Library Research) Literature research is research conducted by reading books and other reference materials to gain knowledge and theoretical foundations related to the problems discussed by the author (Yendrizal, 2021).

Method of collecting data: (a) Primary Data Is data that we can only get from the original or first source, (b) Secondary DataIs data obtained through data that has been researched and collected by other parties related to research problems. The types of research data used are: (a) Primary Data That is, from pre-existing data grouped and then tested with one prospective recipient of data which will be determined based on existing data mining, whether the data is feasible or not, (b) Secondary Data Namely data obtained through data that has been researched and collected by other parties related to research problems such as records or documentation and reports of existing community data obtained from the Koramil Office 1408-02/Tallo.

The hardware used, namely: a). Computer Processor Intel Corei3, b). RAM 4 GB DDR4 GB, c). 1 TB hard drive d. System type 64-bit operating system. The software used: a). Windows 10 Pro Operating System, b). XAMPP Version 7.3.9 (Apache, PHP, MySQL, phpMyAdmin), c). Notepad++. This research was conducted by means of qualitative analysis based on the functioning of the system. Software Testing Method: The author uses the Black box testing method which can be done by observing, on the results of the execution through some test data and checking the functionalities contained in the software. These tests can make a functional. The test design selects valid and invalid inputs so that it can determine the correct output.

Results and Discussion

Results

Decision-making is a thought process in problem-solving to obtain the results to be implemented. There are problems that are easy to solve, and there are also difficult problems, depending on the magnitude of the problem and its breadth with several factors (Renatovna & Renatovna, 2021). Decision-making is the most important part in management, which is connected with the implementation of planning, in terms of deciding on the goals to be achieved. Decision making plays an important role because the decisions taken are the result of final thoughts that must be carried out by the organization (Mrówczyńska et al., 2021). Decisions in management are very important because they concern all aspects. Mistakes in making decisions can be detrimental to the organization, ranging from image losses to money losses. Each decision has a different level of content (Settembre-Blundo et al., 2021). Decisions usually have four levels, namely automatic decisions, decisions based on expected information, decisions based on considerations, and decisions based on double uncertainty. So system-based decisions, it is needed for objective decision-making.

System Analysis

System analysis is the decomposition of a complete information system into its component parts with a view to identifying and evaluating problems, opportunities, obstacles that occur, and expected needs so that improvements can be proposed (Kasauli et al., 2021). The initial design step that the author did in making the system was determining the process of the C4.5 algorithm and making documentation with the Unified Modeling Language (UML). In this study, we used several model diagrams, including use case diagrams, activity diagrams, sequence diagrams, and class diagrams that show each activity of the system.

System Design Use Case Diagram

An application or software, of course a programmer will compile several scenario designs in the form of diagrams or flowcharts. This is done to make it easier to describe the system requirements for the intended problem. One of the most important diagram components to make is a use case (Fauzan et al., 2021). In the system that will be made there are 3 actors including the Community, the MSME data admin, and the Community data admin. As an actor, the community in the system can perform the process of submitting personal data or MSME data as potential recipients of assistance and can view data related to the community and MSMEs that have been input by the admin. As a Community data admin, the system can manage data related to Community data as well as MSME data admins on the system can manage data related to MSMEs. As can be seen in Figure 1.

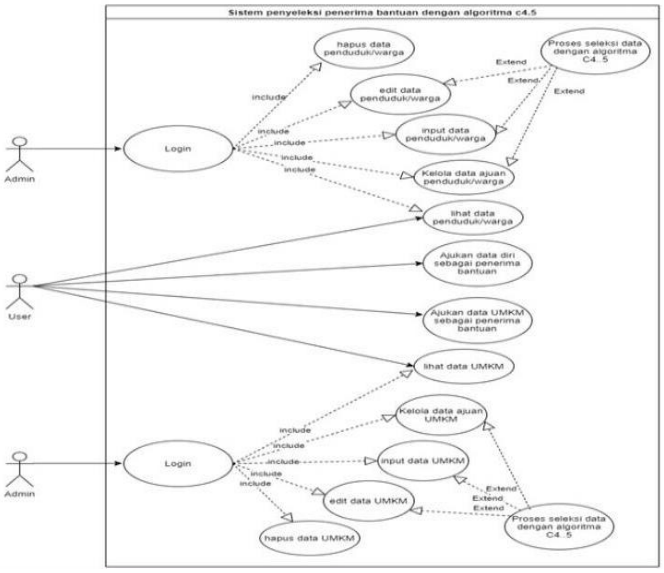

Figure 1. Use Case Diagram

Discussion

Community Data Display (Admin & User)

The main purpose of the user interface is to display the front interface of a system so that it is easy to use, efficient and can make users feel happy while interacting with the system. User Interface is important to meet user expectations in effective application or website functionality. The main menu page contains information about the system that can be seen by anyone who accesses this website without having to go through a login process. On the main page there is a table of community and MSME data and there is a data request form as a candidate for assistance from both the community and MSME. In this section, the admin collects data on prospective participants who receive social assistance, besides that users can also carry out various activities according to the access rights granted by the admin.

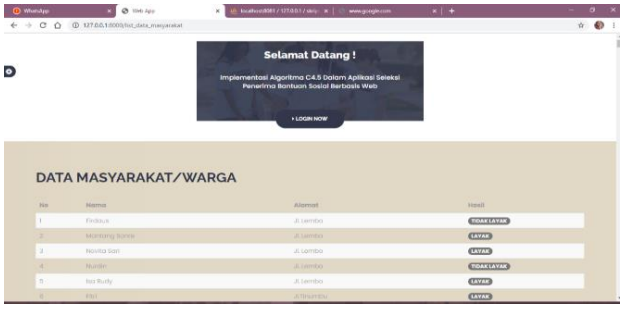

Figure 2. Community Data (Admin & User)

Display Login Admin

Login is a term in terms of computer system security, namely in the form of an entrance process for users to access computer systems. Login is intended to manage the identification process. The minimum login process consists of a username/user account and a password to gain access rights. The following login display is a form for admins to enter the system.

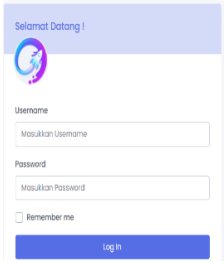

Figure 3. Admin Login

Home Page View (Admin)

The home page is the first page that a person sees when he opens the system. The home page contains the most relevant information on the website. In some cases, the main page may contain important information for each part of the system. The home page will be the start page if the admin is successfully logged in.

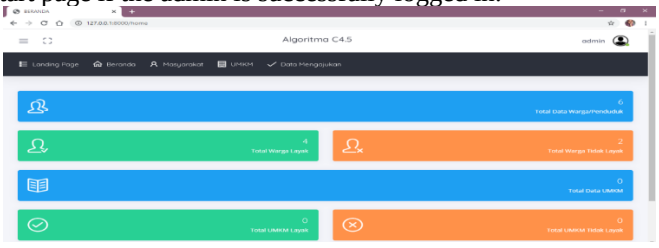

Figure 4. Home Page Display

Page Display Show Community Data (Admin)

This community data display page will later be a page that displays all community data along with the results.

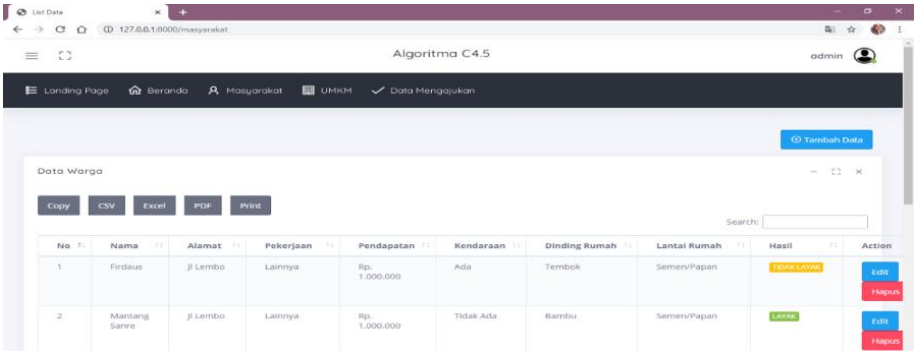

Figure 5. Page Display Community Data (Admin)

Add Community Data Page Display (Admin)

In the image of the Add Community Data page, it is a form to add or input community data which will later be selected.

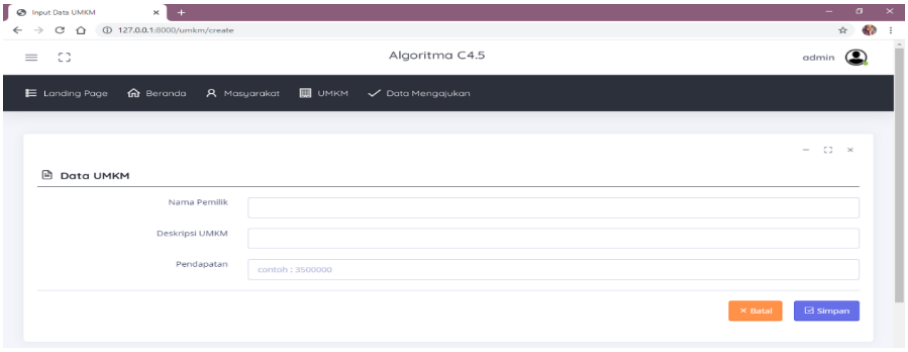

Figure 6. Display Add Community Data

MSME Submission Data Page Display (Admin)

The design of the MSME application data page is a data form that has submitted itself as a prospective MSME recipient.

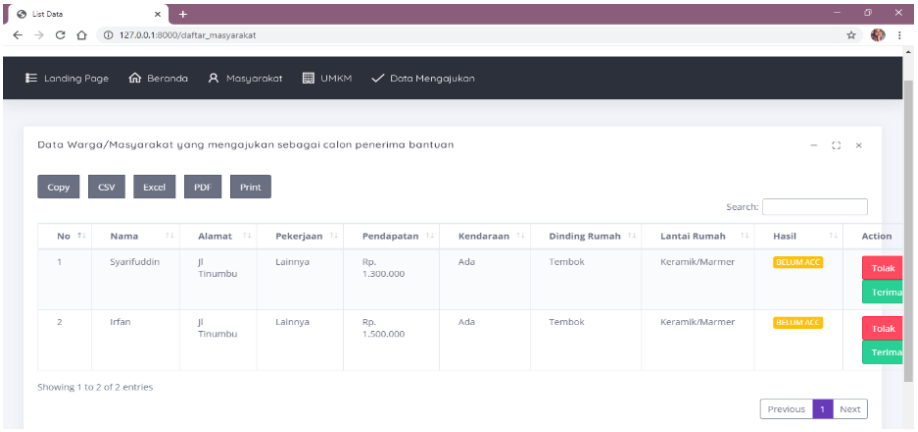

Figure 7. Display of online ticket input

Conclusions and Suggestions

Conclusions

The conclusions of this study are as follows:

1. This research has succeeded in building an application for social assistance recipients so that it can overcome the problems that exist in the current system.
2. This application has succeeded in helping the process of selecting social assistance recipients so that they can function as expected.

Suggestions

In order to obtain better results in the future for applications for social assistance recipients, the authors provide the following suggestions:

1. The author realizes that the system built has shortcomings. Therefore, it is hoped that this application can be used as reference material to develop a more perfect system.
2. The author suggests that in the case of social assistance recipients, using the C.45 Algorithm is not the only method that can be used, so that other methods can be used to channel social assistance recipients that are more targeted and more accurate.

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