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Decision Support System for Recipients of Corporate Social Responsibility (CSR) Fund Assistance Using the Simple Additive Weighting Method (Case Study: PT Dexa Medica)

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Abstract

The effective and accurate management of community assistance fund data through a computerized system can ensure fast and transparent data processing. This study aims to design and develop a decision support system (DSS) capable of identifying eligible recipients of Corporate Social Responsibility (CSR) fund assistance, including financial aid for underprivileged individuals, scholarships, competition support, mosque construction, and COVID-19 relief. The proposed system enhances data collection and management efficiency. Currently, PT Dexa Medica implements CSR programs through conventional manual procedures, which require considerable processing time and often lead to inefficiency and errors. This study applies the Simple Additive Weighting (SAW) method, which utilizes 14 evaluation criteria, each assigned a specific weight corresponding to company priorities. The DSS developed in this research assists decision-makers in accurately determining eligible CSR fund recipients. The system is web-based, developed using the PHP programming language and a MySQL database.

Keywords

Decision Support System, Corporate Social Responsibility, Simple Additive Weighting, Pt Dexa Medica

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Introduction

In the contemporary era of digital transformation, the development of governance and business processes is inseparable from the advancement of information technology (IT), particularly in areas such as data management, analytical modeling, and decision-support systems. The integration of IT into corporate management has enabled organizations to improve efficiency, transparency, and accountability in operational and strategic decision-making. One critical area that increasingly benefits from technological integration is Corporate Social Responsibility (CSR), where businesses are expected not only to pursue profit but also to contribute to sustainable social and economic development. According to Nurlela (2019), CSR embodies a company's voluntary commitment to operate ethically, support economic growth, and improve the quality of life of its employees, their families, and the broader community. These values underscore the dual role of CSR as both a moral responsibility and a strategic business function.

PT Dexa Medica, as one of Indonesia's leading pharmaceutical companies, exemplifies this commitment through various CSR initiatives designed to empower local communities. However, field research conducted at PT Dexa Medica reveals several challenges in implementing these programs effectively—particularly in ensuring equitable distribution of assistance and direct engagement with beneficiaries. Traditionally, CSR funds were channeled through intermediary institutions or community organizations, which occasionally led to inefficiencies, delayed fund delivery, and limited accountability. Recognizing these constraints, PT Dexa Medica has transitioned toward a direct engagement model, wherein the company interacts directly with community members to identify eligible beneficiaries. This new approach necessitates a more systematic, transparent, and data-driven mechanism for evaluating assistance requests and determining eligibility.

The community partners involved in this program are primarily residents of Lr. Sumur Tinggi I, II, and III, who submit applications for financial or small-business assistance through their local neighborhood associations (Rukun Tetangga, RT). To ensure fairness and accountability, each application is accompanied by supporting documents such as certificates of indigency, family cards (Kartu Keluarga), identity cards (KTP), and birth certificates. PT Dexa Medica's public relations team, together with RT representatives, then conducts on-site verification to assess the applicants' living conditions. The evaluation considers a range of socioeconomic indicators including income level, employment status, housing condition, ownership status, number of dependents, energy sources (fuel and electricity), water access, and BPJS (national health insurance) participation. These multi-dimensional data points form the foundation for systematic eligibility assessment.

Given the diversity and subjectivity of these criteria, manual evaluation processes are highly prone to bias, inconsistency, and inefficiency. To overcome these limitations, this study employs a Decision Support System (DSS) framework to assist PT Dexa Medica in managing its CSR distribution objectively and transparently. A DSS serves as an intelligent analytical tool that processes structured and unstructured data to support decision-makers in selecting the most appropriate alternatives. It integrates computational methods with managerial judgment, thus bridging the gap between qualitative and quantitative assessment. In the context of CSR management, a DSS can significantly enhance decision accuracy, improve process transparency, and reduce administrative burden in evaluating numerous applicants.

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Specifically, this study adopts the Simple Additive Weighting (SAW) method as the core decision-making algorithm within the DSS framework. The SAW method—sometimes referred to as the weighted sum model—operates by normalizing evaluation criteria, assigning relative importance (weights), and calculating a composite score for each alternative. The candidate with the highest total score is then determined as the most eligible recipient. As stated by Fajri (2017), SAW offers a straightforward yet robust computational approach for multi-criteria decision-making, particularly in contexts where data attributes are quantitative and decision priorities are clearly defined. Its transparency, simplicity, and ease of implementation make SAW ideal for CSR fund allocation, where fairness and accountability are paramount.

Therefore, the development of a decision support system based on the SAW method aims to provide PT Dexa Medica with a structured mechanism for CSR fund distribution that is both objective and efficient. The system facilitates rapid data processing, reduces subjective bias in human judgment, and supports evidence-based decision-making aligned with company values. Ultimately, this research seeks to contribute to the digital transformation of CSR governance by demonstrating how IT-based decision models can enhance corporate accountability, strengthen community partnerships, and promote sustainable social impact in Indonesia's business sector.

Methodology

System Overview

This study followed a structured system development process that began with identifying user needs and technical requirements. The system was designed to manage data related to applicants, assessments, and CSR fund allocation decisions. Three levels of system users were established: Administrator: Holds full system authority, including access to, modification of, and deletion of data.Head of Public Relations (Pimpinan): Reviews and monitors assessment reports and community evaluation results. Neighborhood Unit Leader (Rukun Tetangga / RT): Distributes registration forms to residents, collects applications, and forwards them to PT Dexa Medica's public relations staff or system administrator for data entry.

The Simple Additive Weighting (SAW) Method

The SAW method operates on the principle of weighted linear combination. Each alternative (applicant) is evaluated based on several criteria, each with a specific weight. The normalized decision matrix is computed, and the final score for each alternative is obtained by summing the products of normalized values and corresponding weights.

The SAW formula is expressed as:

$$V_i = \sum_{j=1}^{n} w_j r_{ij}$$

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The alternative with the hig hest Vi Vi value is considered the best choice. This approach ensures objective evaluation based on predetermined criteria and weight preferences defined by PT Dexa Medica.

Results

The DSS employs a MySQL database named csrsawdb to manage CSR fund application data efficiently.

Gambar 3.1 Database Mysql

The database consists of four main tables:

1. Penduduk (Residents): Stores community applicant data related to CSR fund requests.
2. Kriteria (Criteria): Contains evaluation criteria and associated weight values.
3. Penilaian (Evaluation): Records performance data for each applicant across all criteria.
4. Users: Manages system user accounts and access rights.

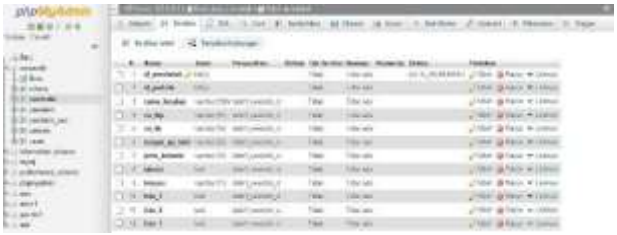

Figure 3.2. Resident Table Structure

Figure 3.3. Criteria Table Structure

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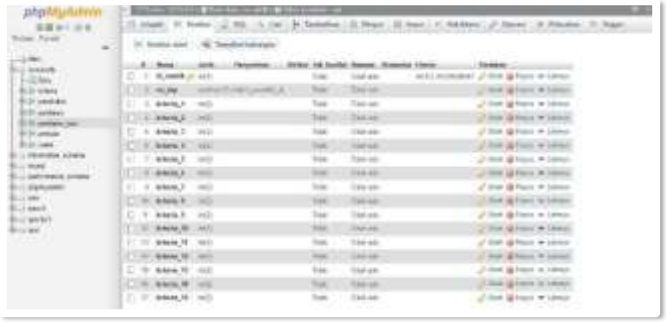

Figure 3.4. Evaluation Table Structure

Figure 3.5. User Table Structure

System Interface Design

Login Page

The login interface serves as the system's entry point for authorized users, ensuring secure access control.

Figure 3.6. Login Page

Home Page

After successful login, users are directed to the main dashboard containing all functional menus and submenus.

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Figure 3.7. Home Page

Recipient Data Page This module allows the administrator to manage records of CSR fund recipients. New entries can be created via the "Add Data" button.

Figure 3.8. Recipient Data Page

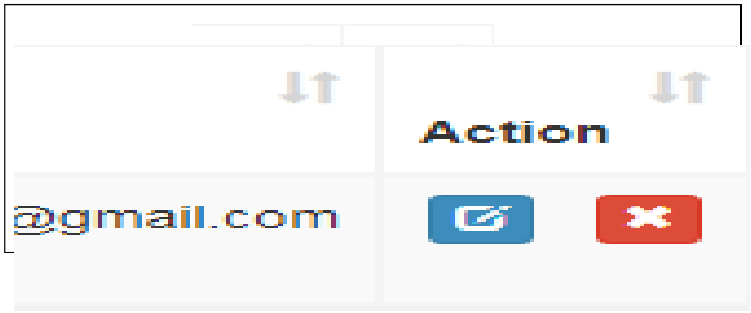

Figure 3.9. Add Data Page

Records include Edit and Delete buttons for updating or removing information as needed.

Criteria Weight Page This interface manages the weights of assessment criteria, allowing dynamic adjustments based on corporate CSR policies.

Evaluation Page This page displays applicant evaluation results for each criterion, supporting transparent assessment and ranking.

Report Page The report module presents comprehensive evaluation outcomes and allows users to print reports for documentation.

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User Management Page The user management module displays all registered users and their roles within the system. Administrators can add, edit, or remove user accounts as required.

Discussion

The implementation of the SAW-based decision support system has enhanced the efficiency and objectivity of CSR fund recipient selection at PT Dexa Medica. The automation of data processing minimizes human error and significantly reduces the time required for manual decision-making.

The system's design supports transparent assessment through clearly defined evaluation criteria and weighting schemes. Using PHP as the programming language and MySQL for database management ensures scalability and stability for large datasets. Furthermore, involving multiple stakeholders administrators, public relations personnel, and RT representatives enhances accountability and promotes fair decision-making.

Overall, the DSS contributes to improved governance of CSR fund distribution, supporting PT Dexa Medica's social mission by ensuring that assistance is accurately targeted to qualified beneficiaries.

Conclusion and Recommendations

Based on the research findings and system implementation, the following conclusions are drawn:

1. The decision support system using the SAW method effectively integrates the predefined variables from the Dinas Sosial (Social Affairs Office) and Badan Pusat Statistik (Central Bureau of Statistics) into ten poverty-based eligibility criteria.
2. The DSS facilitates efficient and accurate CSR fund allocation by providing objective recommendations for underprivileged residents.
3. The ranking process simplifies the decision-making procedure, reducing processing time and minimizing subjectivity.
4. The system provides decision-makers with reliable data support before final determination by PT Dexa Medica's management.

Disclosure Statement

The authors declare no potential conflicts of interest. This research was conducted independently to support academic advancement within the Faculty of Computer Science, Universitas Bina Darma.

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Biographical Notes

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