PRACTICAL WORK REPORT

INTERNATIONAL CLASS PROGRAM REPORT

ANALYSIS AND DESIGN OF AN AUTOMATED CLOTHES-DRYING SYSTEM BASED ON WEATHER SENSORS

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2026

15 April '26
90 (A)

APPROVAL SHEET
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ANALYSIS AND DESIGN OF AN AUTOMATED CLOTHES-DRYING SYSTEM BASED ON WEATHER SENSORS

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PREFACE

The author offers all praise and thanks to Allah SWT for His blessings, mercy, and guidance, which have made it possible to complete this project report titled “ANALYSIS OF ISSUES AND DESIGN OF AN AUTOMATED CLOTHES-DRYING RACK SYSTEM BASED ON WEATHER SENSORS TO IMPROVE THE EFFICIENCY OF THE CLOTHES-DRYING PROCESS”.

This report is prepared as a final assignment for the International Course Program (ICP) at Universitas Medan Area.

The author wishes to extend deepest appreciation to those who have provided invaluable support and guidance during the preparation of this report:

1. Dr. Eng. Supriatno, S.T., M.T., as the Dean of the Faculty of Engineering, University of Medan Area
2. Dr. Ir. Chalis Fajri Hasibuan, S.T., M.T., as the Head of the Industrial Engineering Study Program, University of Medan Area.
3. Nukhe Andri Silviana, S.T., M.T., as the as the Internship Advisor for her guidance, support, and valuable advice throughout the completion of this report.
4. Parents and family members who have always offered prayers and unwavering support.
5. The academic advisor and all instructors in the ICP program at the University of Medan Area who provided guidance and feedback throughout the project’s development.
6. Friends and teammates who have helped and provided encouragement and cooperation during the preparation of this report.

The author acknowledges that this report still has its shortcomings. Therefore, constructive criticism and suggestions are greatly appreciated to facilitate future improvements. It is hoped that this report will be of benefit, both academically and as a reference for technological development, particularly in the fields of automation systems and industrial engineering applications.

Medan, 12 March 2026

Alya Fakhira Nasution

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CHAPTER I

INTRODUCTION

1.1 Background

Drying clothes is a routine activity carried out in almost every household. Generally, the drying process is still done manually, using sunlight as a natural heat source. Although this method is simple and cost-effective, it has its drawbacks, especially when the weather changes suddenly.

In tropical regions like Indonesia, weather conditions are often unpredictable. Rain can fall suddenly without any clear warning. This poses a problem for residents who are engaged in outdoor activities and cannot monitor the condition of their laundry. As a result, clothes that are being dried may get wet again, requiring the drying process to be repeated (Hidayat & Akbar, 2024). This situation leads to a waste of time, effort, and resources.

From an industrial engineering perspective, this issue indicates inefficiencies in the drying process because the system still relies on manual supervision. An uncontrolled process can reduce the effectiveness of household activities and decrease users' productivity.

With advancements in technology in the fields of control systems and microcontrollers, it is now possible to design an automated system capable of responding to changes in environmental conditions in real time (Irawan & Karyanto, 2023). By utilizing a rain sensor to detect weather conditions, an LDR sensor to detect light intensity, and a microcontroller as the controller, a clothesline system can be designed to automatically move to a more sheltered area when rain is detected, and return to its original position when environmental conditions are favorable.

In light of these issues, an analysis and design of an automatic clothesline system based on weather sensors were conducted, with the aim of improving efficiency in the clothes-drying process, reducing the risk of clothes getting wet in the rain, and making daily activities easier for users. Additionally, the designed system is expected to serve as a simple, easy-to-implement, and beneficial solution for the community.

1.2 Problem Formulation

Based on the background described above, the research question for this internship is as follows:

1. How can we analyze the issues with a clothes-drying system that is still operated manually?
2. How can we design an automated clothes-drying system using rain sensors, LDR sensors, and a microcontroller as a solution to these issues?
3. What is the system's operating concept to improve efficiency and reduce reliance on manual supervision?

1.3 Activity Objectives

The objectives of this internship are as follows:

1. Identify and analyze issues with conventional clothes-drying systems.
2. Design a concept for an automated clothes-drying system based on weather sensors.
3. Analyze the potential for improving the efficiency and effectiveness of the drying process through the implementation of an automated system.

1.4 Benefit of the Activity

The expected benefits of this internship are as follows:

1. For Students

   To deepen understanding of the application of control and automation concepts to real-world problems, enhance skills in analyzing and designing technology-based systems, and apply industrial engineering knowledge to improve process efficiency.

2. For the Community

   To provide an alternative solution to the problem of laundry getting rained on, to help improve time and labor efficiency in household activities, and to offer a simple innovation that can be further developed.

3. For Scientific Development

   To serve as an initial reference in the development of weather-sensor-based automated systems, and to provide an overview of the application of efficiency and productivity concepts in household systems.

CHAPTER II

LITERATURE REVIEW

2.1 Concepts of Automation and Control Systems

Automation is a process of controlling operations and mechanical or electronic equipment performed automatically to replace human roles in monitoring and decision-making (Oktariawan et al., 2013). Automation aims to make a system operate more efficiently, accurately, and stably. In its application in the field of engineering, an automated system uses sensors to receive information, controllers to process data, and actuators to execute commands systematically.

A control system is a set of devices and mechanisms designed to regulate and direct the course of a process so that the system operates in accordance with predetermined objectives (Aziz & Aribowo, 2025). Generally, a control system consists of three main components: input (sensors), a controller, and output (actuators). These systems can be categorized into open-loop systems, which do not use feedback, and closed-loop systems, which do use feedback.

In a weather-sensor-based automatic clothesline system, the rain sensor and LDR sensor serve as input components, the microcontroller acts as the controller, and the motor functions as the drive or actuator. When the sensor detects rain, the microcontroller sends a command to the motor to retract the clothesline to a more sheltered area. With this system, the clothes-drying process becomes more efficient and no longer relies entirely on manual supervision.

2.2 Mikrokontroler Arduino

A microcontroller is a microcomputer chip that physically takes the form of an IC (Integrated Circuit). The operating principle of this microcontroller is based on the software stored within it, and that software is designed according to the desired application. In order for the microcontroller to function according to the program that has been created, it must be powered by an external voltage source. This voltage source can come from an adapter, a battery, or a USB connection. The voltage supplied must meet the microcontroller's requirements so that the system can operate stably and avoid damage.

Once power is supplied, the microcontroller will begin executing the program that has been uploaded to it. The program contains instructions for reading data from sensors, processing the data, and controlling output components such as motors. In an automatic clothesline system, the microcontroller plays a crucial role as the control center that manages the entire system workflow.

In this study, the microcontroller used was an Arduino Uno. The Arduino serves as the main controller, receiving signals from the rain sensor and processing the data to control the motor, which automatically moves the clothesline to a sheltered area when rain is detected.

In addition to Arduino, other microcontrollers such as the ESP32 can also be used because they offer similar capabilities for reading sensor inputs and controlling outputs to actuators. Using these microcontrollers allows the system to operate automatically, more efficiently, and responsively without requiring constant user intervention.

2.3 Rain Sensor

The rain sensor is a component that detects the presence of rainwater in the RainSlide system. This sensor responds when its surface is struck by raindrops, causing a change in the sensor's electrical value(Irwanto et al., 2019). This change in electrical value is then transmitted to the microcontroller as an input signal to indicate the environmental conditions—whether it is raining or not. The microcontroller reads this signal and processes it according to the pre-designed program.

In an automatic clothesline system, the rain sensor plays a crucial role as the primary factor in decision-making. When the sensor detects rain, the system automatically activates the motor to move the clothesline to a more sheltered location. Conversely, if no rain is detected, the system does not send a command to the motor, so the clothesline remains in its original position.

With the rain sensor, the system can operate automatically without requiring constant supervision from the user. This makes the drying process more convenient and efficient, and helps reduce the risk of clothes getting wet due to unpredictable weather changes.

2.4 LDR Sensor

Sensors are components used to provide input in the form of data or values to an Arduino, which are then processed according to the designed program. One type of sensor frequently used is the LDR (Light-Dependent Resistor). An LDR is a light-sensitive electronic component, also known as a photocell, photoconductor, or photoresistor. This sensor operates by utilizing a semiconductor material whose resistance varies depending on the intensity of the light it receives (Setyaji & Handoko, 2019).

The resistance value of an LDR decreases when exposed to bright light, while it increases in dark conditions. This change in resistance is proportional to the amount of light received by the LDR's surface (Suryanto & Atmaja, 2017). In practice, the LDR is typically connected to a voltage divider circuit so that changes in resistance can be converted into a voltage signal that the Arduino can read via its analog input pins. In this way, the Arduino can determine whether conditions are light or dark based on the received voltage value.

In the RainSlide system, an LDR sensor can be used to detect sunlight intensity. This information can serve as an additional factor in decision-making, such as determining whether the weather is sunny or cloudy. As a result, the system can be developed to be more responsive not only to rain but also to changes in lighting conditions in the surrounding environment.

2.5 DC/Servo Motors as Actuators

An actuator is a component in an automation system that converts electrical signals into mechanical motion. In a control system, the actuator serves as the component that executes commands from the controller, thereby producing the desired action (Yudhistira et al., n.d.). In the RainSlide system, the actuators used are DC motors or servo motors that automatically move the clothesline sliding mechanism. These motors operate based on signals sent by the microcontroller, allowing the movement of the clothesline to be controlled according to conditions detected by the sensors.

DC motors are widely used in control systems because they offer advantages in terms of speed and direction control. These settings are adjusted via control signals such as PWM (Pulse Width Modulation) sent by a microcontroller. With this control, the motor can move the clothesline to a more sheltered area when rain is detected.

Meanwhile, servo motors can be used when more precise position control is required. The choice between a DC motor and a servo motor depends on the system's requirements, particularly in terms of torque, motion stability, and power efficiency (Elektro et al., 2021). With these actuators, the RainSlide system can operate automatically and respond to signals from the rain sensor, thereby reducing user involvement in the drying process.

In addition, the actuator can be evaluated by observing the motor's performance in moving the clothesline, in terms of smoothness of movement, positional accuracy, and operational stability. The results of this observation can be used as a basis for assessing the reliability and efficiency of the system as a whole.

2.6 The Concepts of Efficiency and Productivity

Efficiency refers to how well a system can utilize resources appropriately without waste. With RainSlide, efficiency is evident in the time and effort saved, as users no longer need to manually move the laundry when it rains. The system operates automatically based on sensors, making the process more practical and controlled. Additionally, electricity usage can be managed to prevent overconsumption (Fitrianingsih, 2024).

Productivity refers to the ratio of output to resources used (Meylisa Thesa Walukow, Mieke Roring, 2016). With RainSlide, the desired outcome is that clothes remain dry and the drying process is not disrupted by changes in the weather. With the help of an automated system, the likelihood of clothes getting wet again is reduced, so the drying process does not need to be repeated. This makes the work more efficient.

By applying the concepts of efficiency and productivity, RainSlide not only serves as a tool but also provides added value in terms of saving time and effort and improving the efficiency of household chores. These concepts of efficiency and productivity form the foundation of the RainSlide system's design, which aims to improve the efficiency of the clothes-drying process.

CHAPTER III

METHODOLOGY

3.1 Types and Research Approaches

This study employs a design-based approach. The study began by identifying common problems in household clothes-drying systems, particularly clothes that become wet again due to sudden changes in weather and a lack of constant supervision.

Based on these issues, an automatic clothesline system utilizing rain sensors, LDR sensors, and an Arduino microcontroller was designed as the proposed solution. This research did not proceed to the stage of physical prototyping or experimental testing, but focused on system design, conceptual modeling, block diagram creation, and the development of a system workflow diagram

Therefore, this study falls under the category of applied research, as it aims to develop practical technological solutions to everyday problems in the household environment.

3.2 Data Collection Methods

The data collection techniques used in this internship project include:

1. Observation

   This was conducted by directly observing the clothes-drying process, which is still done manually. From these observations, information was obtained regarding common challenges, particularly when it rains suddenly, causing the clothes to get wet again.

2. Literature Review

   This was conducted by searching for and studying various references, such as books and journals, related to automatic control systems, the use of Arduino microcontrollers, rain sensors, LDR sensors, as well as the concepts of actuators and system efficiency. This study aims to support the design of a solution appropriate for the problems identified.

3.3 Identification of Problems with Manual Clothesline Systems

Based on the results of our observations, several issues were identified with the clothes-drying system currently in use. Clothes are generally still dried manually, without the aid of an automated system. Users must constantly monitor weather conditions to ensure that the clothes remain safe while drying.

When it rains suddenly, clothes that are hanging out to dry risk getting wet again, requiring the drying process to be repeated. This situation can result in various losses, particularly in terms of time and effort (Sumarno et al., 2019). Failure to monitor the laundry can cause clothes to get wet again due to rain or even fall off due to strong winds. Additionally, when clothes have been moved to a shaded area, users often forget to put them back out to dry when the weather clears up, resulting in suboptimal drying.

This issue can also cause anxiety when users leave home while the laundry is still hanging outside. This becomes even more critical if the clothes being dried are needed soon for example, for use the following day. Additionally, the manual drying process is considered inefficient because it still requires supervision and extra effort from the user, which can interfere with other activities.

Given these conditions, a solution is needed that can make the drying process more practical and capable of automatically responding to changes in the weather.

3.4 System Requirements Analysis

Based on the issues identified in the manual clothes drying system, a system requirements analysis was conducted to serve as the basis for designing the RainSlide automatic clothes-drying system. The purpose of this analysis was to determine the key components required for the system to operate effectively and fulfill its intended functions.

The system was designed using the input–process–output concept. On the input side, a rain sensor and an LDR sensor are used to detect environmental conditions, specifically the presence of rain and light intensity. The rain sensor is used to determine whether it is raining, while the LDR sensor is used to detect light or dark conditions based on the amount of light received. Both sensors provide signals to the system as indicators of weather conditions.

In the processing phase, an Arduino microcontroller is used as the system's control center. The Arduino is responsible for receiving and processing data from the rain sensor and the LDR sensor, and then determining the appropriate action to take based on the pre-designed program.

Next, the output section uses a DC or servo motor as an actuator to operate the clothesline mechanism. The motor automatically shifts the clothesline to a more sheltered location when rain is detected. Additionally, the system is equipped with an LCD (Liquid Crystal Display) that shows sensor status information, such as rain status and light intensity, allowing users to monitor the system's status in real time.

In addition to these main components, the system also requires a power supply to provide electrical energy so that all components can function properly. Furthermore, a frame and guide rails are needed as mechanical components to support the stable movement of the clothesline.

With this needs analysis, it is hoped that the designed system will function optimally and be able to address the issues present in the manual drying system.

3.5 System Concept Design

The system concept design was carried out in several stages aimed at illustrating how the RainSlide automatic clothesline system will function as a whole. The first stage involved creating a system block diagram to show the relationships between the components used in the system.

Next, a flowchart was created to logically illustrate the system's workflow, from the sensor reading process to the movement of the clothesline. Following that, the operational mechanisms of each main component namely the sensor, the microcontroller as the controller, and the actuator as the drive were designed.

The result of this design is a conceptual model of the RainSlide automatic clothesline system, which is expected to function effectively in response to changes in weather. With this system, the clothes-drying process becomes more convenient and reduces the need for manual supervision.

3.6 Research Framework

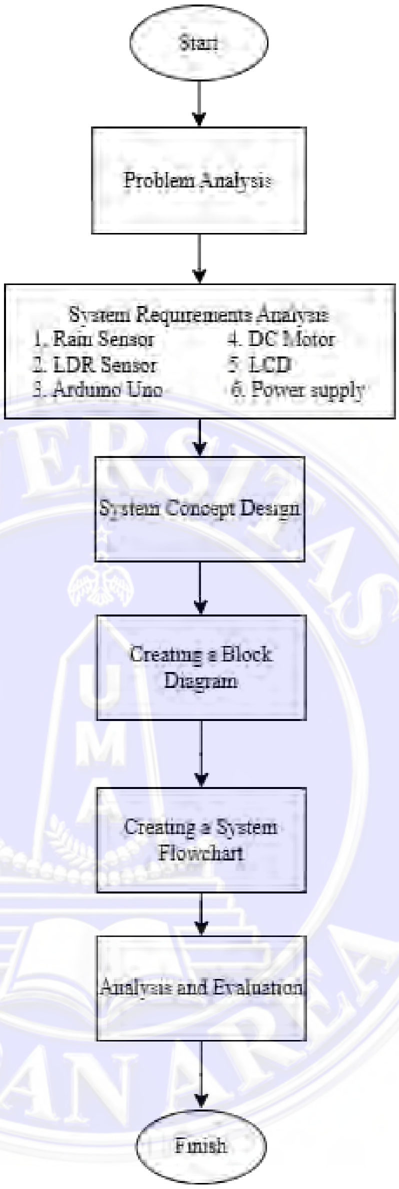

Figure 3.1 Research Framework

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Overview of the Designed System

The system designed in this study is an automatic clothesline system based on a rain sensor and an Arduino microcontroller. This system was developed as a solution to a common household problem: clothes getting wet again due to sudden rain when no one is watching.

In general, the system operates based on the input–process–output concept. On the input side, a rain sensor is used to detect rainfall and an LDR sensor is used to detect light intensity in the surrounding environment; both sensors generate signals that are then sent to the Arduino as the control center. The Arduino processes the received data based on a pre-designed program to determine the actions the system will take. If conditions indicate rain, the Arduino will send a command to the motor, acting as an actuator, to move the clothesline to a more sheltered location; conversely, if no rain is detected, the clothesline remains in its original position.

In addition, the system is equipped with an LCD (Liquid Crystal Display) that provides information on light or dark conditions as supplementary data regarding weather conditions. Information from both sensors is displayed on the LCD screen, allowing users to easily monitor the system's status in real time. With this design, the system is intended to operate automatically without requiring constant manual intervention.

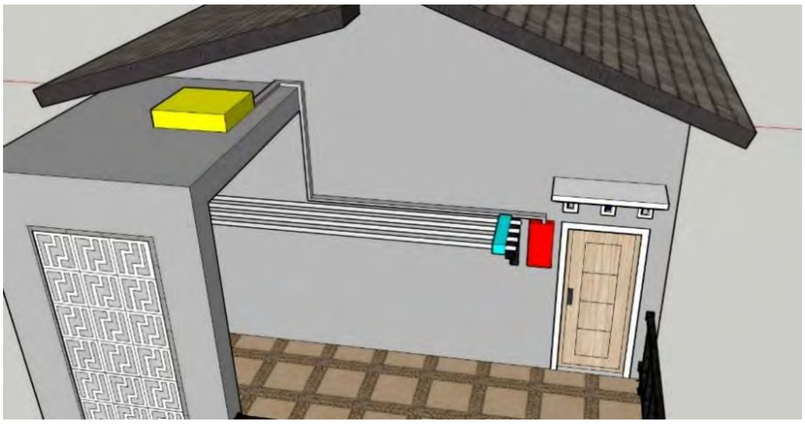

Figure 4. 1 Design of the Automatic Clothesline

Figure 4.1 shows the design of an automatic clothesline system installed on the exterior of a house. The system uses a horizontal rail as the path along which the clothesline moves. A motor is mounted on one side of the rail to serve as the drive mechanism, pulling and pushing the clothesline based on detected conditions.

The control components and sensors are placed at the top or in a more sheltered area to reduce the risk of damage from direct exposure to rainwater. This placement also ensures that the rain sensor and LDR sensor can function optimally in detecting environmental conditions, including the presence of water and light intensity. When the rain sensor detects water, a signal is sent to the microcontroller for processing; the microcontroller then activates the motor so that the clothesline moves into a safer area. Conversely, when no rain is detected, the system does not activate the motor, so the clothesline remains in the outdoor position for the drying process. With this mechanism, the system can operate automatically and provide clearer information to the user.

This design is intended for homes with limited space and utilizes the walls as the primary supports for the rail system. Overall, this design illustrates how the automatic clothesline system works prior to the implementation or construction phase.

4.2 Comparison with manual systems

Figure 4. 2 Manual Clothesline System

Manual drying systems have several limitations, particularly in terms of monitoring, responding to weather changes, and efficiency in terms of time and labor. In practice, the drying process remains highly dependent on the user, requiring constant attention.

Typically, when the weather looks sunny, users hang their clothes out to dry and then leave them because they have other activities to attend to. However, when it rains suddenly, they often do not notice immediately, so the clothes being dried get wet again. This situation forces users to repeat the drying process from the beginning.

As a result, drying times are longer. Clothes that should dry in about 5 hours can take 8–10 hours or even longer if they get caught in the rain. This shows that the manual system is less efficient because it is heavily influenced by weather conditions and delays in user response.

In addition, manual systems also require more effort because users have to repeatedly move the clothes, both when it rains and when the weather clears up. This can happen several times a day if the weather is unpredictable, thereby increasing the physical workload.

In contrast, automatic clothes-drying systems can respond directly to changes in the weather via sensors. This makes the drying process more convenient, efficient, and less reliant on user supervision.

Table 4. 1 Differences Between Manual and Automatic Systems

Aspect	Manual System	Automated System
Supervision	Requires monitoring	No need for constant supervision
Response to rain	Slow (depending on the user)	Fast (Automatic)
Time efficiency	Less efficient	More efficient
Energy	Labor-intensive	Minimal energy
Risk of wet clothing	High	Low

4.3 Results of the System Block Diagram Design

A system block diagram is designed to illustrate the relationships between the main components of a system..

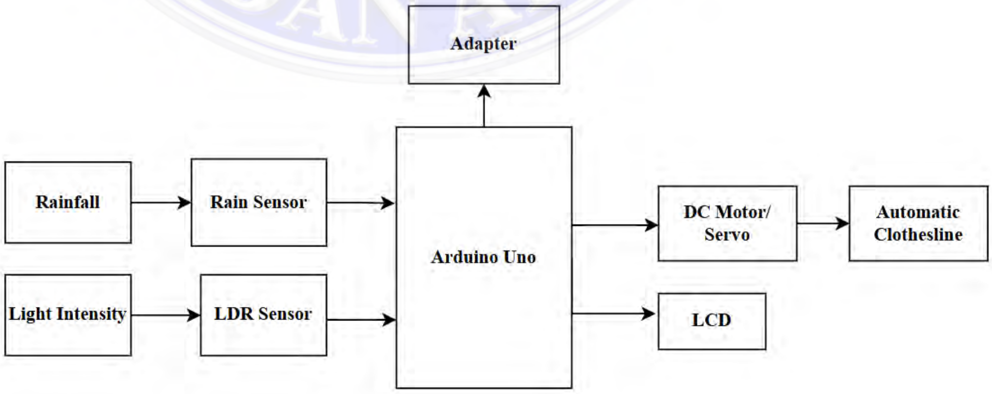

Figure 4. 3 System Block Diagram

In general, the system consists of four main components, namely:

a. Rain Sensor

The rain sensor serves as an input to detect environmental conditions, specifically the presence of rainwater. When the sensor's surface comes into contact with water, there is a change in the electrical signal value, which is then sent to the Arduino for processing.

b. LDR Sensor

The LDR sensor also serves as an input to detect light intensity in the surrounding environment, allowing the system to determine whether conditions are light or dark.

c. Arduino Uno

The Arduino Uno functions as the system's control center. The Arduino receives signals from the rain sensor, then processes them based on a pre-designed program to determine whether it is raining or not.

d. DC Motor/Servo

The Arduino sends signals to the DC motor or servo, which acts as an actuator. The motor automatically moves the clothesline to a sheltered area when rain is detected. Conversely, if no rain is detected, the clothesline remains in its original position.

e. LCD

The LCD serves as a display that presents real-time sensor data to the user.

f. Power Adapter

The power adapter serves as the electrical power source that supplies all components in the system, including the sensors, Arduino, and motor, ensuring the system operates properly and stably.

Overall, these four components are interconnected within a single system that operates sequentially: input (sensor), processed by the controller

(Arduino), and producing an output in the form of motor movement. As a result, this system is capable of automatically responding to environmental conditions without requiring direct user intervention.

4.4 System Flowchart Design Results

A flowchart is created to systematically illustrate the system's workflow. Based on the design, the system's workflow is as follows:

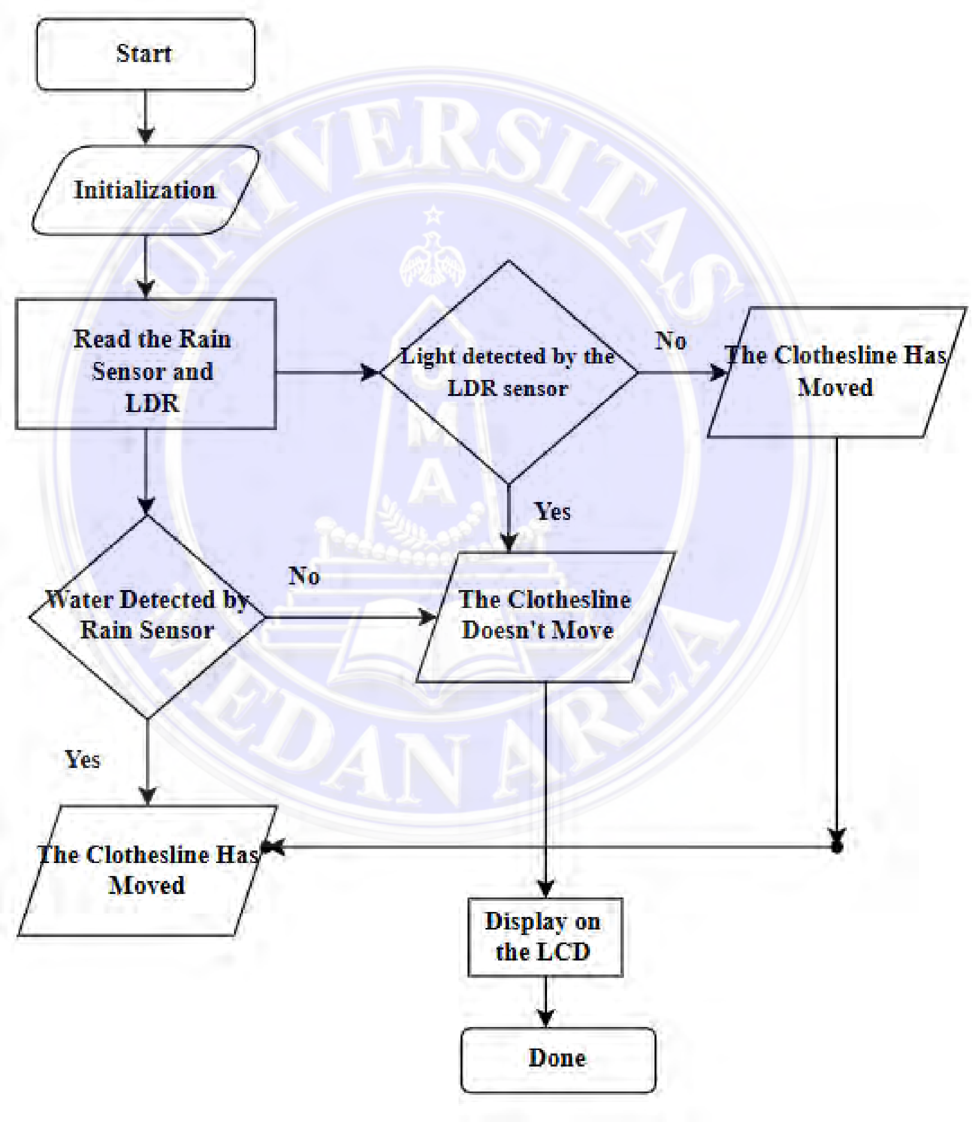

Figure 4.4 Flowchart Sistem

1. The system starts running.
2. The rain sensor and LDR sensor continuously monitor environmental conditions.
3. Data from the sensors is sent to the Arduino for processing.
4. The Arduino evaluates the conditions based on the received data.
    a. If the rain sensor detects water, the Arduino activates the motor to pull the clothesline to a more sheltered location.
    b. If no rain is detected, the motor is not activated, so the clothesline remains in its original position.
5. Sensor status information is displayed on the LCD so the user can monitor the system's condition.
6. After that, the system returns to the sensor reading process and repeats the same steps continuously (looping).

This flowchart shows that the system operates automatically and continuously to monitor environmental conditions. With its sensors and LCD display, the system is not only capable of responding to changes in weather conditions, but also provides information directly to the user without requiring constant supervision.

4.4 How the System Works

Conceptually, the system's operation begins when the rain sensor and LDR sensor continuously monitor environmental conditions. The rain sensor detects the presence of water, while the LDR sensor measures ambient light intensity. Both sensors generate signals in the form of voltage changes, which are then transmitted to the Arduino microcontroller via input pins.

After receiving data from the sensor, the Arduino will process the signal according to the programmed code. This program contains the logic to determine environmental conditions specifically, whether it is currently raining or if the weather has cleared up.

If the rain sensor detects water, the Arduino will send a signal through the output pin to activate the motor. The motor then moves to pull the clothesline into a more sheltered area so that the clothes do not get wet. This information is also displayed on the LCD screen so that users can see the system's status in real time.

Conversely, when the rain sensor no longer detects rain and the LDR sensor indicates that the light is sufficiently bright, the Arduino will reactivate the motor to move the clothesline back to its original position so that the drying process can continue.

With this mechanism, the system can protect clothes from the rain while automatically retracting the clothesline without requiring user intervention, making the drying process more convenient and efficient.

4.5 System Analysis and Evaluation

Based on the design results, the RainSlide automatic clothesline system offers several advantages. The system is battery-powered, so it does not require solar panels to operate. Additionally, the system is designed to be splash-resistant and can move automatically when rain is detected by the sensor. In terms of cost, the components used are relatively affordable, and installation is fairly straightforward. The mechanical design is kept simple by using stainless steel rods as the clothesline's movement rails. This material provides strength and corrosion resistance, while the simple design makes the system suitable for homes with limited land or tight spaces.

However, this system also has several limitations. The use of batteries requires periodic recharging or replacement. In addition, the system's performance still depends on the environmental conditions detected by the sensors, so sensor readings are not always entirely accurate. Mechanical components also require periodic maintenance to ensure they continue to function properly. Furthermore, the system still relies on an external power source because it is not yet capable of generating its own power.

Compared to manual systems that require constant supervision, the RainSlide system reduces the need for users to monitor weather conditions. This improves time efficiency, as users no longer need to manually move the laundry when it rains or hang it out to dry again when the weather clears up. This process can be performed automatically by the system based on data from sensors. As a result, this automated system improves the efficiency of the drying process compared to conventional methods.

Overall, this system design is expected to help reduce the risk of clothes getting wet in the rain and make the drying process more convenient. Although it still has limitations, the system is open to further development to optimize its performance.

CHAPTER V

CLOSING

5.1 Conclusion

Based on the results of the analysis and design work conducted, it can be concluded that the RainSlide automatic clothesline system offers a solution to the problem of clothes drying, which is still done manually. This system is designed to utilize rain sensors and LDR sensors as inputs, an Arduino microcontroller as the controller, and a motor as the actuator that automatically moves the clothesline.

The system works by continuously monitoring environmental conditions. When the rain sensor detects water, the clothesline moves to a more sheltered location. Conversely, when it stops raining and there is sufficient light, the clothesline returns to its original position to resume the drying process. This information is also displayed on the LCD screen so users can see the system’s status at a glance.

Based on the design results, this system is capable of improving time efficiency and reducing the need for users to monitor weather conditions. In addition, the system can also help reduce the risk of getting wet from sudden rain. As such, RainSlide can serve as a practical and useful solution for everyday household activities.

5.2 Suggestions

Based on the results of the design work that has been carried out, there are several recommendations for the future development of the system to ensure it operates more effectively.

First, the system can be improved by enhancing the accuracy of sensor readings, for example by adding auxiliary sensors or performing calibration to ensure more stable readings under various environmental conditions.

Second, improvements can be made to the power supply, such as the use of solar panels, so that the system is not entirely dependent on external energy sources.

Third, the system can also be enhanced by adding app-based monitoring features or Internet of Things (IoT) capabilities, allowing users to monitor the condition of the clothesline remotely.

With these developments, it is hoped that the RainSlide system will become more efficient, reliable, and offer greater value.

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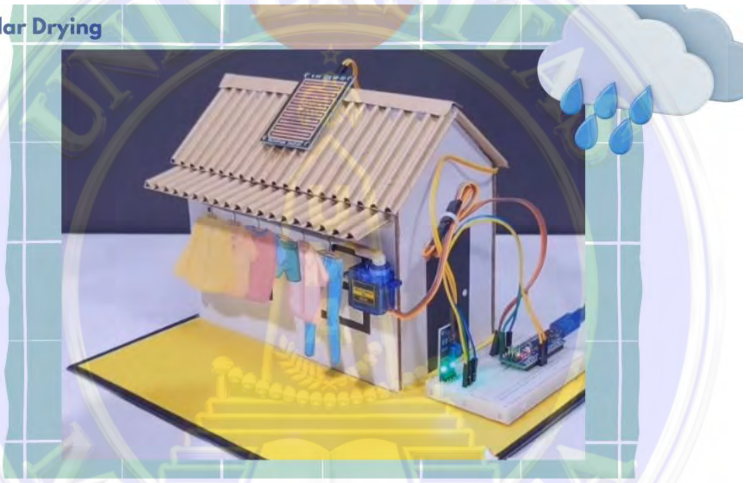
ATTACHMENT

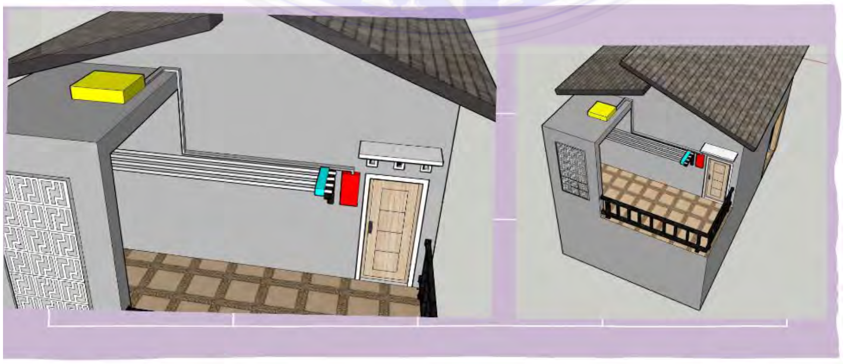

WHAT'S THE
SOLUTION ??


1.smart solar drying
What is Smart Solar Drying?
Smart Solar Drying is a clothes-drying system that uses sunlight as the main energy source, but also has smart features to protect the laundry when it rains.
The system usually has rain sensors and an automatic sliding or cover mechanism. When it's sunny, the clothes dry naturally under the sun. But when it starts to rain, the sensor detects it and automatically moves or covers the clothes to keep them dry.
This makes drying clothes more practical, eco-friendly, and worry-free — no more rushing outside when it suddenly rains! 😎☔

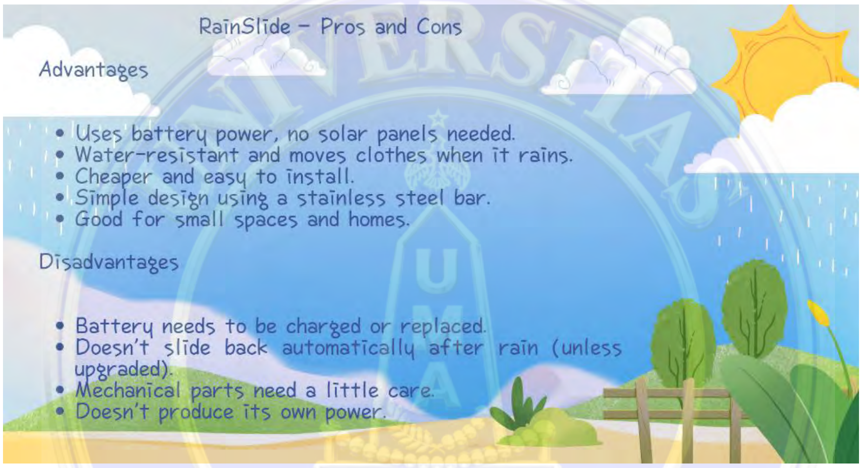
Smart Solar Drying



Rain Slide




Smart Solar Drying – Pros and Cons
Advantages
• Uses solar power, no need for home electricity.
• Eco-friendly and works automatically.
• Moves clothes to a safe spot when it rains.
• Slides clothes back out to dry after the rain stops.
• Works even during power outages.
Disadvantages
• Depends on the weather.
• Higher cost because of solar panels.
• Needs cleaning and maintenance.
• Installation is a bit more complicated.


RainSlide – Pros and Cons
Advantages
• Uses battery power, no solar panels needed.
• Water-resistant and moves clothes when it rains.
• Cheaper and easy to install.
• Simple design using a stainless steel bar.
• Good for small spaces and homes.
Disadvantages
• Battery needs to be charged or replaced.
• Doesn't slide back automatically after rain (unless upgraded).
• Mechanical parts need a little care.
• Doesn't produce its own power.


CONCLUSION
A smart clothes dryer with a rain sensor can automatically move your clothes when it rains, so they stay dry without us having to keep an eye on them. This technology makes laundry easier, saves time, and makes the home more comfortable.