Design Wireless Communication System for Kemplang Wine Cutter and Dryer Control

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Abstract. This paper of mixing has found a mixer automation tool that has been made by previous researchers, where the automation of this stirrer is versatile and can be made various kinds of Palembang culinary specialties. Furthermore, the researcher will continue with the manufacture of automatic cutting tools and kemplang wine dryers, where after the stirring process for making wine kemplang has been completed the next process is by cutting grape crackers that are adjusted to the size that has been set with a size of approximately 4 × 1.2 cm. TX Nodemcu data reading against Arduino measurement results using an oscilloscope gets a reading in the form of timing data which represents digital data flow with information in the form of Ascii code, this code contains information provided by the MCU node based on the receipt data provided by the smartphone. From the TX pin test, it can be proven that there is data traffic in the form of commands given by the user to the ac motor engine. As for the measurement of the RX pin of nodemcu, a similar reading occurs as measured on the TX pin, it's just that here there is a difference in the shape of the information flow, if on the TX pin the flow of information from nodemcu to arduino on the RX side is information data received by nodemcu from the results feedback reading the running time reference from the arduino so that it can be displayed on the application display.

Keywords: Artificial Intelligence · MIT Application · NodeMcu · Sensor and Transducer · Internet of Thing

1 Introduction

Kemplang Palembang typical wine is one of the traditional Palembang foods with the basic ingredients of fish and tapioca flour. Kemplang wine production is still very limited both in terms of quality and quantity. This is due to: the technology of the kemplang wine production process is conventional, the equipment is still simple, as well as the ability of human resources, most of whom have junior high school education and very limited capital and are managed conventionally. Therefore, kemplang wine products are often unable to meet market demand [1–3].

In this wine cracker production process, the stirring stage is the activity that requires the most stirring process, so that many wine cracker producers or entrepreneurs do the mixing first. This method of mixing has found a mixer automation tool that has been made by previous researchers, where the automation of this stirrer is versatile and can be made various kinds of Palembang culinary specialties. Furthermore, the researcher will continue with the manufacture of automatic cutting tools and kemplang wine dryers, where after the stirring process for making wine kemplang has been completed the next process is by cutting grape crackers that are adjusted to the size that has been set with a size of approximately 4×1.2 cm.

Previously, the workers faced obstacles, namely that one part of the kemplang grape processing process that became an obstacle to increasing production capacity was in the process of cutting and drying grape kemplang. The process of cutting and drying kemplang grapes is done using very traditional tools. This causes limited production capacity and cannot meet market demand.

Through the development of an automation system for wine kemplang cutters and dryers, it is hoped that people who are engaged in the wine kemplang industry or business can quickly produce grape kemplang and do not wait a long time, after the consumer orders, in addition to the automation system for these kemplang wine cutters and dryers. Will make it easier for small and medium industrial communities to produce delicious and crunchy grape crackers when eaten [4, 5].

Objects and research problems do affect considerations regarding the approach, design or approach method that will be applied, not all objects and service problems can be approached with a single approach, so it is necessary to understand other different approaches so that once the objects and problems to be carried out, do not fit. or less perfect with one approach then another approach can be used, or maybe even combine them, this is the task of the community service team leader. Furthermore, by observing, interviewing or collecting certain data, images and information that can be symbolized as the dynamics of social interaction by exchanging experiences, later they will have social differences so that problem solving can be resolved. Furthermore, problem solving will be carried out using qualitative techniques as an approach in this community service, namely by creating an automatic control system that can make information systems and administrative activities good, this is the task of the entire community service team and partners.

TX Nodemcu data reading against Arduino measurement results using an oscilloscope gets a reading in the form of timing data which represents digital data flow with information in the form of Ascii code, this code contains information provided by the MCU node based on the receipt of information data provided by the smartphone. From the TX pin test, it can be proven that there is data traffic in the form of commands given by the user to the ac motor engine. As for the measurement of the RX pin of nodemcu, a similar reading occurs as measured on the TX pin, it's just that here there is a difference in the shape of the information flow, if on the TX pin the flow of information from nodemcu to arduino on the RX side is information data received by nodemcu from the results feedback reading the running time reference from the arduino so that it can be displayed on the application display.

2   Design System

The system design that will be carried out is to test the data communication system to regulate the movement of the dc motor, solenoid, and proximity sensor so that all of them can regulate the IoT-based kemplang wine cutting and dryer process. Then the application that will be used is MIT, where MIT functions as a monitoring tool for kemplang wine, then NodeMCU ESP 8266 which functions to receive incoming data from the system for sending data to the application, for this Proximity sensor functions as a distance detector for interrupting cutters, DC motors which serves to drive the kemplang wine with precise control of angle, acceleration and speed, and the last relay which functions to activate the DC motor for more details can be shown in Figs. 1 and 2.
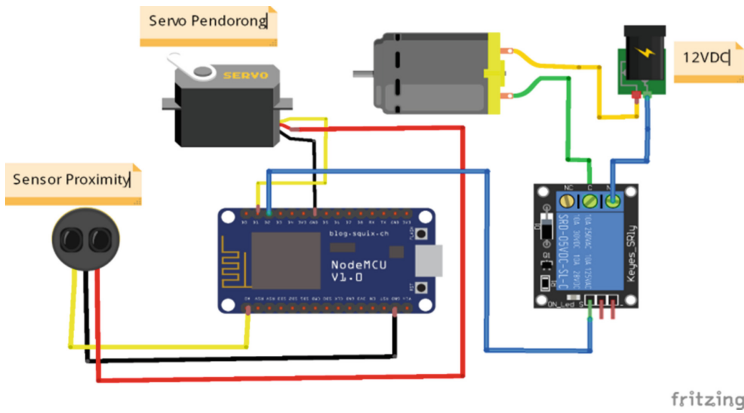
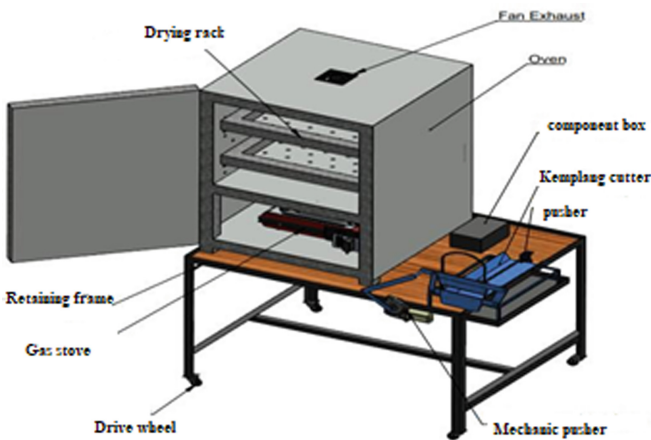**Fig. 1.** Kemplang Wine Cutting and Dryer set

Fig. 2. Design of Palembang's Typical Kemplang Dryer and Cutter Based IoT

3   Current Result

After the design of the Design Wireless Communication System for Kemplang Wine Cutter and Dryer Control has been completed, then it is operated and produces the desired work. Then the next step is testing the tool, this test aims to find out the results of a tool, whether the designed tool can work well and see the interaction on the software that has been programmed. Then the next step that must be done is to test and analyze and find out the results of the tool testing.

In the manufacture of this kemplang wine cutter and dryer, software and hardware tests will be carried out where the software uses the MIT application while the hardware will measure the success rate of the use of proximity sensors, DC motors (Fig. 3).

Next is the test results of measuring the results of cutting kemplang grapes using a DC motor, this cutter cuts logs of kemplang with a length of approximately 3cm and takes approximately 2 to 5 min, to be more clear, it can be shown in Fig. 4.

Result of temperature testing on the kemplang wine dryer, as shown in the graph (Fig. 4), where the noble temperature emerged from June 19, 2022 with the temperature still 0˚. The voltage consistently increases until August 3, 2022, when on August 4, 2022 it decreases and begins to rise again on August 5, 2022. So that the final result on August 10, 2022 is 43˚.

Proximity sensor testing aims to determine how much voltage is generated by the wave when the sensor detects motion. With a real time graph display for monitoring voltage data through the displayed graph (Fig. 5). Data retrieval on August 8, 2022 for ferrous metal can be said that ferrous metal has poor sensitivity so it is difficult to detect by sensors at long distances, as seen in the graph above at a distance of 0.5 the results are very high but at the next distance, namely 1, 1.5 the results are decreasing.
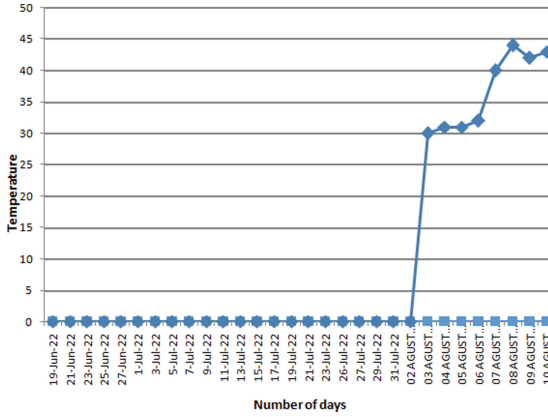

Fig. 3. Result using MIT application

Fig. 4. Graph of temperature wave in kemplang wine dryer
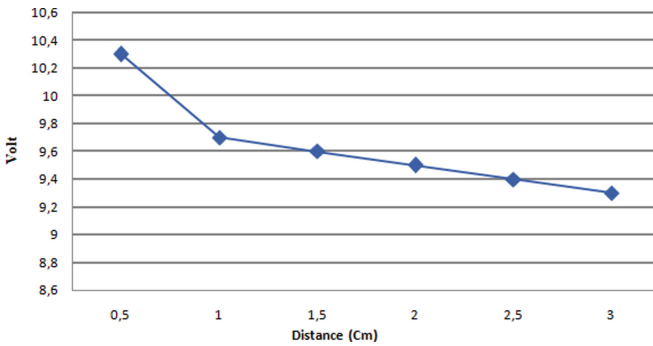

Fig. 5. Result move proximity sensors

4   Conclusion

Based on the change in the value of Rpm to the time of testing the tool, it can be seen that the value of Rpm that is read from the tachometer measuring instrument has decreased the reading of the rpm value. This decrease in reading was caused by the addition of viscosity or viscosity to the shredded dough due to the reduced water content during cooking. From the TX pin test, it can be proven that there is data traffic in the form of commands given by the user to the ac motor engine. As for the measurement of the RX pin of nodemcu, a similar reading occurs as measured on the TX pin, it's just that here there is a difference in the form of information flow, if the TX pin the flow of information comes from nodemcu to arduino on the RX side is the information data received by nodemcu from the results feedback reading the running time reference from the arduino so that it can be displayed on the application display.

References

1. Sholihin, Eka Susanti, "Humanoid Robot Control System Balance Dance Indonesia and Reader Filters Using Complementary Angle Value", E3S Web of Conferences 31, 2018.
2. Sholihin, Eka Susanti, A. A. Pramudita and M. M. Rose, "MIMO antenna with cross polarisation printed yagi elements for MIMO router", *Proc. 2017 3rd International Conference on Wireless and Telematics (ICWT) Palembang Indonesia*, pp. 65–69, July 2017.
3. Eka susanti, Rosita febriani, Sholihin, Eka susanti, Emilia hesti, 2018, *The design of hand gesture robot software based on wireless technology*, IEEE conferences ICOIACT 2018, Indonesia, p.p 401–406.
4. Eka Susanti, *, Ica Admirani, Romi Wilza, Irawan Hadi, Sholihin Sholihin," Automation of The Palembang Semage Fabric Yarn Spinner", Proceedings of the 5th FIRST T1 T2 2021 International Conference (FIRST-T1-T2 2021).
5. Suzan Zefi, Eka Susanti *, Sholihin Sholihin, M. Zakuan Agung, R.A Halimahtussa'diyah," Innovation Technology of Lekor Dough Mixer Based Internet of Thing", Proceedings of the 5th FIRST T1 T2 2021 International Conference (FIRST-T1-T2 2021).
6. Emilia Hesti Sholihin, Sarjana," Coffee Groping Control System using tcs 3200 Sensor Based on xbee", Journal of Physics: Conference Series, Volume 1167, 2019.
7. Amirah fakhirah Emilia Hesti, Sholihin, Adewasti, Sarjana," Internet of thing for the commando Robot Command System", Journal of Physics, IOP publishing ltd, Volume 1500,2020.
8. Emilia Hesti, Adewasti, Rosita Febriani, Sholihin, Eka Susanti," Xbee pro module application in to organize and monitoring earthquake disaster location with the robot control system", International Conference on Information and Communication Technology (ICOIACT) 2018, page 651–655, 2018.