



# Design of Technology Salted Fish Dryer at Salted Fish si Abang Center Palembang Based on Internet of Thing

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**Abstract.** One of the existing UMKM industries is the salted fish manufacturing industry at the Siabang Salted Fish Center Palembang. Salted fish are in demand by various types of people ranging from children to parents. Making salted fish is the simplest preservation with low cost. The process of making salted fish requires a fairly long process so that the level of dryness of the fish is right, with this drying process can only be done during the day. To overcome the damage, most Indonesian people do fish processing, including processed into salted fish. To simplify the process of drying salted fish at the Siabang Palembang Salted Fish Center, it can be done using the help of a fish dryer in other words an oven, which will be regulated by using Internet of things technology. Currently, there are many UMKM that use this equipment in a manual state. This industry requires an oven that is sufficient to meet production at a certain temperature, this is because temperature greatly affects the quality of production. So with the Internet of Things technology, it can speed up the process of setting the length of drying salted fish, so as to increase production yields. This salted fish dryer can be instructed to start drying with controlled controls that utilize Internet of Things technology through the Blynk application. This system uses NodeMCU ESP8266 as a microcontroller and a DS18B20 temperature sensor as a temperature monitoring sensor in the dryer.

**Keywords:** Artificial Intelligence · Electronic Components · Sensor and Transducer · Embedded System · Internet of Thing

## 1 Introduction

In the industrial era 4.0, small and medium industries are required to adapt to technological advances. IoT technology has developed rapidly, so the demand now is how this technology helps humans and makes all human activities more efficient. All have been connected to the internet and all can be monitored or controlled remotely. The existence of this IoT technology allows collaboration and interaction with various devices in various places as long as these tools are connected to the internet network [1, 2].

With the rapid advancement of technology in various fields today, it is possible to do everything on a computer basis to help human activities. The role of information

systems in the UMKM industry is basically a communication process that contains the transformation of knowledge, values, and skills outside the environment [2–4]. If the information system is applied in the UMKM industry, it can increase the efficiency of the production process carried out. The development of the times requires graduates to have the ability and potential in their field. It really depends on student activity. UMKM which is a business activity run by the community with the aim of expanding employment opportunities and providing economic services to the community at large. Business activities that are included in the UMKM are expected to help increase sustainable economic growth and be able to realize national stability.

To simplify the process of drying salted fish at the Siabang Palembang Salted Fish Center, it can be done using the help of a fish dryer in other words an oven, which will be regulated by using Internet of things technology. Currently, there are many UMKM that use this equipment in a manual state. This industry requires an oven that is sufficient to meet production at a certain temperature, this is because temperature greatly affects the quality of production. So with the Internet of Things technology, it can speed up the process of setting the length of drying salted fish, so as to increase production yields.

This salted fish dryer can be instructed to start drying with controlled controls that utilize Internet of Things technology through the Blynk application. This system uses NodeMCU ESP8266 as a microcontroller and a DS18B20 temperature sensor as a temperature monitoring sensor in the dryer.

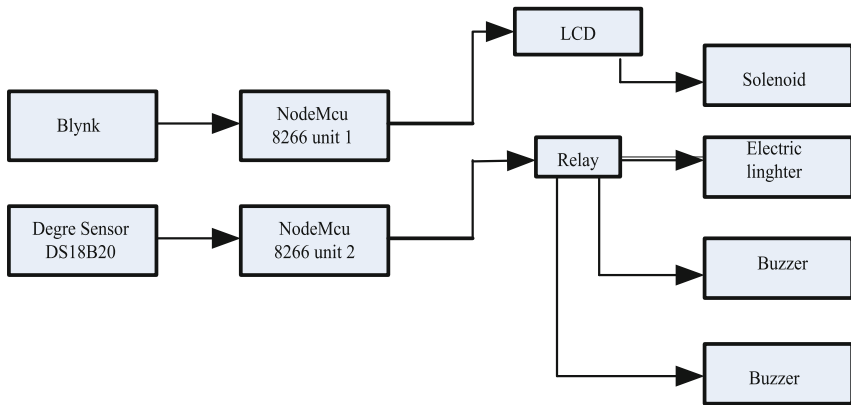
To simplify the process of drying salted fish at the Siabang Palembang Salted Fish Center, it can be done using the help of a fish dryer in other words an oven, which will be regulated by using Internet of things technology. Currently, there are many UMKM that use this equipment in a manual state. This industry requires an oven that is sufficient to meet production at a certain temperature, this is because temperature greatly affects the quality of production.

From these problems, technological assistance is needed called the Internet of things. Internet of things is a concept or program where an object has the ability to transmit or transmit data over a network without using the help of computers and humans. The development of IoT can be seen from the level of convergence of wireless technology, microelectromechanical (MEMS), internet, and Quick Responses Code. IoT is also often identified with Radio Frequency Identification as a method of communication.

So with the Internet of Things technology, it can speed up the process of setting the length of drying salted fish, so as to increase production yields. To dry salted fish that has thick meat or large salted fish it takes a temperature of 80 °C within 3 h 20 min. To dry salted fish that has thin flesh or small salted fish, it takes a temperature of 80 °C within 2 h. If the temperature in the oven exceeds 100 °C, the fish will have the potential to be overcooked or even burnt. Therefore, if the temperature has exceeded 100 °C, the fire will automatically turn off and will come back to life when the temperature has stabilized.

## 2 Design System

In process of designing and manufacturing this tool includes several stages. The first stage is making block diagrams, flowcharts, and selecting components that suit your



**Fig. 1.** Block Diagram Design of Technology Salted Fish Dryer at Salted Fish si Abang Center Palembang Based on Internet of Thing

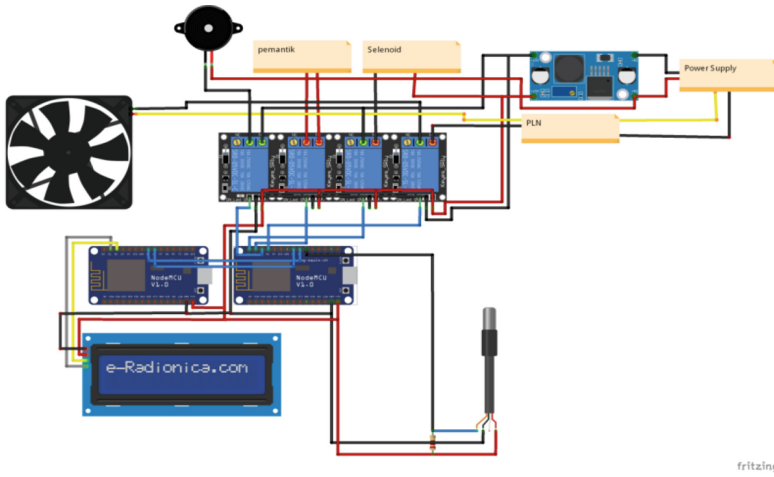
needs, while still paying attention to the specifications of the components in the circuit so that no damage occurs during component installation. Then proceed with electronic and mechanical design as well as how it works and its working principle, and finally testing of the design of the tool made.

As for the process of making this salted fish drying oven, it is completed with the following work steps; Software Design, In designing this software, it is arranged how the work of the circuit to be made, using the instructions contained in the ESP 8266 and the NodeMCU microcontroller where the input and output can be used directly. In this case, planning a working system of how the salted fish drying oven can be controlled by Android through the Blynk Application, Hardware Design, In this hardware design we will create block diagrams, circuit schematics, component layouts, and component installation. Mechanical Parts In this mechanical design is the final finishing process so that the desired tool is realized. This section covers the design and framework of the tool, component installation, and testing of the salted fish drying oven it self (Figs. 1 and 2).

The circuit in the tool can be grouped based on the block diagram that has been designed previously. The circuit in the block diagram has their respective functions that are interconnected to form a system in the salted fish drying oven.

The battery sends a voltage of 12 V then goes to the power supply regulator for the power supply and DC voltage rectifier in the salted fish drying oven. The voltage from the power supply then enters the relay to execute commands on the components. From the relay into the NodeMCU module, the Arduino IDE program has been entered. Then the program was sent to the ESP8266 module. From the ESP 8266 module, it sends to Blynk on Android. Then Blynk gave orders to the salted fish drying oven such as opening the solenoid valve, turning on the electric lighter, setting the temperature sensor, turning on the blower and automatically sounding the buzzer.

The working principle of the picture above is the operation of the salted fish dryer using a gas oven based on the internet of things starting with initializing pins and variables. Then connect the android WiFi as well as the NodeMCU WiFi. After the WiFi is



**Fig. 2.** Design of Technology Salted Fish Dryer at Salted Fish si Abang Center Palembang Based on Internet of Thing



**Fig. 3.** Design of the tool with a drawing 3D Blender Application

connected, the NodeMCU will read the data obtained from Blynk. Otherwise, Android WiFi and NodeMCU WiFi will try to reconnect. If the solenoid button is pressed then the solenoid will be on and the process is complete, if the lighter button is pressed the lighter will be on and the process is complete, if the blower button is pressed the blower will turn on and the process is complete, and if the buzzer button is pressed the buzzer will turn on and off. process is complete.

After the button testing is complete, the data for the drying time of salted fish can be inputted. Then the time data will be read by the NodeMCU, then the drying process will start for the previously inputted time. The temperature sensor will detect the temperature in the oven, if the temperature exceeds 80 °C then the blower will be on, but if the

temperature does not reach 80 °C then the blower will remain off and the drying process will continue. If the blower has been off and the countdown time is still a lot, the drying process will continue. After the countdown time is up, the drying process is complete. The notification that the drying process has been completed is by sounding the buzzer. Below shows the actual design of the tool with a drawing with the 3D Blender Application (Fig. 3).

### 3 Current Result

At this stage of testing the results, the software used is the Blynk and Android applications. Blynk can be used to control and monitor the work of a tool. At the time of testing, a test method with several samples can be used to determine the differences in each of these samples. Furthermore, the next test results will detect a gas solenoid valve device which will function to spread gas to all pipelines that will be used for the heating process, so that the fish will dry quickly with the temperature, which is set automatically with the blynk application. Next, the test results on the electric lighter was carried out to find out how long the connection time for the Blynk application's electric lighter button was needed by the system to connect to the internet. Next, the test results on the blower lighter is carried out to find out how long the connection time for the Blynk application blower button is needed by the system to connect to the internet, and then the test results on the buzzer lighter is carried out to find out how long the connection time for the Blynk application buzzer button is required by the user. System to connect to the internet. For more details, will show the results of the test tools designed for the Design of Technology process Salted Fish Dryer at Salted Fish Si Abang Center Palembang Based on Internet of Thing (Tables 1, 2, 3, 4 and Fig. 4).

From the results of the graph data for drying salted fish, it can be seen that the tool will reach the maximum and minimum temperature limits that have been set in the system. If the maximum temperature limit is 80 °C then the blower on the tool will turn on and lower the temperature on the dryer. If it reaches the minimum temperature limit of 60 °C, the blower on the tool will not turn on and the drying process is carried out again (Fig. 5).

**Table 1.** Internet connection test result blynk application solenoid button on the system

<b>Condition</b>	<b>Respon</b>	<b>Delay</b>	<b>Results</b>
ON	Active	1.52 s	Valve Ok
OFF	No	1.78 s	Valve No
ON	Active	5.61 s	Valve Ok
OFF	No	2.18 s	Valve No
ON	Active	1,58 s	Valve Ok
OFF	No	3.03 s	Valve No
ON	Active	3.0 s	Valve Ok
OFF	No	4.23 s	Valve No

**Table 2.** Internet connection test results blynk application lighter buuton on the system

<b>Condition</b>	<b>Respon</b>	<b>Delay</b>	<b>Results</b>
ON	Active	4.03 s	Fire Spread
OFF	No	0.87 s	Fire does't Spread
ON	Active	5.16 s	Fire Spread
OFF	No	1.72 s	Fire does't Spread
ON	Active	2.76 s	Fire Spread
OFF	No	0.60 s	Fire does't Spread
ON	Active	4.04 s	Fire Spread
OFF	No	1.98 s	Fire does't Spread

**Table 3.** Internet connection test results blynk application blower button on the system

<b>Condition</b>	<b>Respon</b>	<b>Delay</b>	<b>Description</b>
ON	Active	2.52 s	Yes
OFF	No	1.88 s	No
ON	Active	3.63 s	Yes
OFF	No	2.05 s	No
ON	Active	1.46 s	Yes
OFF	No	3.08 s	No
ON	Active	2.90 s	Yes
OFF	No	3.27 s	No

**Table 4.** Internet connection test results blynk application buzzer button on the system

<b>Condition</b>	<b>Respon</b>	<b>Delay</b>	<b>Results</b>
ON	Active	0.42 s	Sound
OFF	No	0.47 s	No. Sound
ON	Active	0.42 s	Sound
OFF	No	0.40 s	No. Sound
ON	Active	0.29 s	Sound
OFF	No	0.29 s	No. Sound
ON	Active	0.40 s	Sound
OFF	No	0.39 s	No Sound

From the results of the graph data for drying salted fish, it can be seen that the tool will reach the maximum and minimum temperature limits that have been set in the system. If the maximum temperature limit is 80 °C then the blower on the tool will turn on and lower the temperature on the dryer. If it reaches the minimum temperature limit

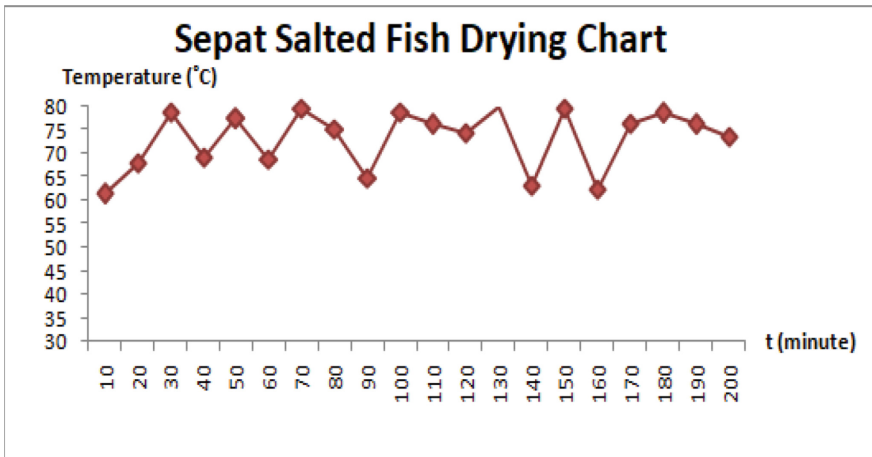


Fig. 4. Sepat salted fish drying process graph

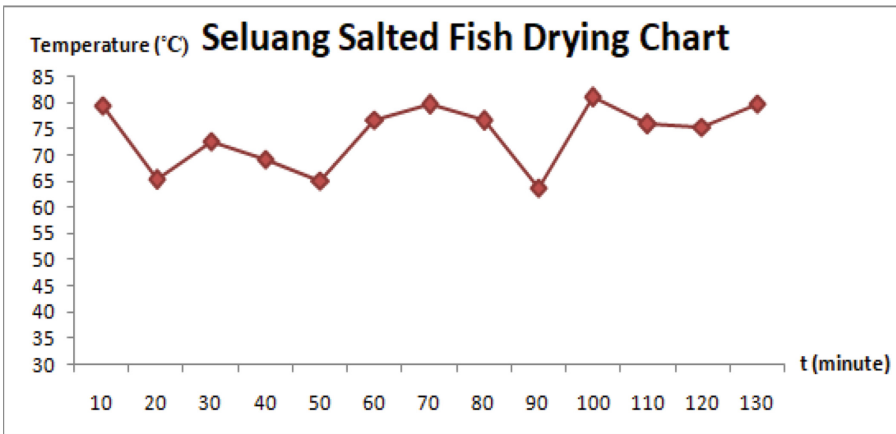


Fig. 5. Seluang salted fish drying process graph

of 60 °C then the blower on the tool will not turn on and the drying process is carried out again.

## 4 Conclusion

For the results of internet connection testing, obtained the average length of time required by the system to connect to the internet is 9.42 s with a description of the connection connected. With 9.42 s to connect the system to the internet, this is quite fast. In testing the start button connection, the average time is 2.9 s with the description on and the average time is 2.73 s with the description off.

To dry salted fish that has thick meat or large salted fish it takes a temperature of 80°C within 3 h 20 min. To dry salted fish that has thin flesh or small salted fish, it

takes a temperature of 80°C within 2 h. This system uses NodeMCU ESP8266 as a microcontroller and a DS18B20 temperature sensor as a temperature monitoring sensor in the dryer.

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