Natural Language Processing to Waterwheel with Jawa Language

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To cite this article: Zulfian Azmi *et al* 2018 *J. Phys.: Conf. Ser.* **1116** 022007

View the article online for updates and enhancements.

Natural language processing to waterwheel with Jawa language

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Abstract. When all electronic devices can be deprogrammed according to the requested function. The interests of the appropriate command of the human side need to be revealed, including the use of the local language. Waterwheels that mechanically work in each pond, for example, require automatic control to function efficiently, and this requires adjustment to the environment in which the appliance works, including adjusting the use of Natural Language Processing to assign tasks to the wheel. This paper will briefly describe the use of Jawa language to control the tool.

1. Introduction

In general, many tools that make is easier for humans to improve their welfare [1, 2]. But not a few of those tools that work continuously, without stopping and spending other resources inappropriately, consequently this will disrupt the balance of nature, which results in human well-being as well [3]. Therefore, every tool must be able to adapt to its environment in order to work efficiently according to real demanded needs [4, 5].

Using a waterwheel as a means of air circulation in shrimp ponds that work continuously although the quality of pond water is good, this results in the use of energy inefficient and expensive [6]. Aeration system of addition of air in water is needed to increase the oxygen content in water which can be done by using waterwheel [7]. However, the use of a waterwheel requires control of different sides, including local language engagement that is integrated with the smartphone, as will be described as follows.

2. Review and Motivation

The waterwheel is a component of the spinning water that energizes the rotating axis [8]. Waterwheel is a means to convert water energy into mechanical energy in the form of torque on the shaft of the mill. There are several waterwheel functions that can be used one of them is to improve water quality in shrimp ponds. For the realibility of environment and tool [9, 10], the testing on the waterwheel by adjusting the air circulation automatically and move according to the needs of oxygen, it is important to improve the water quality of shrimp habitats for the needs

Table 1. Translation example for Jawa

No.	Rule of pattern	Command (in Jawa)	Meaning
1	$S\vert P$	$S\vert P$	$S\vert P$
(a)	<KB><KK>	Pabrik Banyu Manggon	The waterwheel is alive
(b)	<KB><KK>	Pabrik Banyu Mati	The waterwheel is dead
(c)	<KK><KB>	Manggon Pabrik Banyu	(a)
(d)	<KK><KB>	Mati Pabrik Banyu	(b)

Table 2. Example: Translation between Indonesia-Jawa

Indoesia	Jawa
hidup	manggon
mati	mati
Kincir air mati	Pabrik banyu mati
Kincir air hidup	Pabrik banyu manggon

of high protein foods. If using a manual waterwheel does not automatically work so optimized by utilizing the Arduino Uno component to be programmed to turn on and off through human voice recording input and Natural Language Processing knowledge utilization to generate intelligent algorithms using Jawa language so as to produce a waterwheel considering wisdom local and beneficial to the community [11, 12].

One way to increase contact with water is by mechanical equipment that serves to increase the value of oxygen that enters the water [13]. Since the waterwheel function, in addition to increasing oxygen directly into the water, circulates the water surface on a water base to ensure that the oxygen content in the water is evenly distributed and to move the aerated water rapidly to the surrounding area so that the unaerated area can be aerated [14]. And the use of manual waterwheel is not effective so that it takes the control module on the waterwheel in the shrimp pond to improve the quality of ponds with variables: Dissolved oxygen, temperature, salinity and water PH. The input and output produced by the waterwheel produce the system by considering local wisdom in the area and with the Natural Language Processing (NLP) knowledge approach with the use of Jawa language, so it is necessary to analyze with Natural Language processing model [15]. And for data communication system using smartphone.

3. Method

Knowledge on computers capable of understanding a command is spoken in the form of everyday language has components consisting of:

(i) Parser of Natural Language components: A system that takes natural language input sentences and breaks it down into some grammatical parts (nouns, verbs, adjectives and so on)

(ii) Knowledge Representation: Serves to analyze the parser output to determine its meaning, in this case the intended knowledge representation system is a dictionary containing natural language words in this case is Jawa language and its meaning.

(iii) Output translator: Serves to present a knowledge system that results from the translation of input from natural language.

(iv) Pattern Rules: Use of subjects, predicates and objects that use nouns, verbs and adjectives.
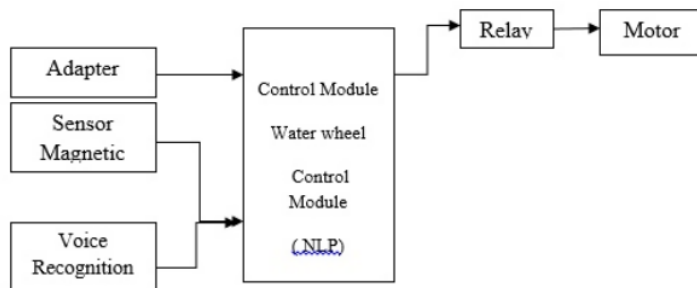
(v) Flowchart for checking sentence rules

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Figure 1. Block system diagram

4. Discussion: Implementation design

With the utilization of Natural Language Processing knowledge can be used to turn on and off the waterwheel in making use of Jawa language so familiar with the local language. And according to case study in new market village of Tanjung Ibus District of Stabat of Langkat Regency. This system consists of several elements such as voice recognition which is a hardware device that serves as voice input on the system. In the table below the words used and the pattern rules that exist for the analysis on the control module. Some of the words used and translated into Jawa as system analysis are shown Table 1 and Table 2.

The block diagram below describes the steps of the whole system process starting from the start of the system will initialize the input port and output device in the process of detecting the recorded sound, if the recorded sound is appropriate then the waterwheel motor will work to move and if it is not suitable then the magnet sensor will not move motor on the waterwheel so that cannot rotate. Tests on the magnetic sensor to determine the optimal or not the input and output logic conditions that occur. Magnet sensor is an open circuit when given high voltage for on motor on waterwheel and when magnetic sensor is given low voltage to off the waterwheel motor, see Fig. 1. Magnet sensor test results

$$t_{ms} = \begin{cases} 1 & \text{if motor life} \\ 0 & \text{if motor dead} \end{cases} \tag{1}$$

This design can be implemented as follows,

(i) The input to the control module involving NLP comes from the sensor for oxygen information.

(ii) The module gets the power supply from the solar converter which gives it connected to the oxygen sensor.

(iii) Feedback provides information to users via smartphone.

(iv) The command is given via smartphone through a special module that controls the waterwheel.

From the discussion can be taken some notes are:

(i) Using voice recognition by smartphone for testing on a waterwheel involving the Bahasa word as output in order to turn the motor on a waterwheel or turn off the waterwheel, it can work effectively.

(ii) Design a control module with voice character input by utilizing NLP, whereby this knowledge used to instruct in order to turning on and off with a recognized voice character.

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(iii) System can analyze the word to turn on or off waterwheel in language Jawa utilize local wisdom in local community in Tanjung Ibus Village, Stabat District.

5. Conclusion

Control of the kincirangin or controller in general not only involves the environmental side but also involves the use of smartphone technology. This certainly can not be separated from the implementation of NLP to build the interface with humans as users of the tool. In this case, it has been implemented the use of Jawa language in an area to control the waterwheel.

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