PROPOSED MODEL ON WEATHER FORECASTING ANNOUNCEMENT SYSTEM FOR IMPROVING INDIAN AGRICULTURE

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ABSTRACT

The main objective of this project is to collecting as much data as possible about the current state of the atmosphere (particularly the temperature, humidity etc.) and display on the screen of the LCD and announce this weather condition in Hindi.

Weather forecasting plays an important role in agricultural production. It is based on the current technology and science to predict the state of the atmosphere for a future time and a given particular location. The measurements of temperature, relative humidity by using the sensors is not only important in weather monitoring but also crucial for many other applications like agricultural and industrial processes.

The advantage of this project is that it helps in preventing weather aberrations which cause physical damage to crops and soil erosion. It also helps in crop growth, development and yield of the field and in which period of time farmer spread of pests and diseases in their field for proper cultivation.

KEYWORDS: *Voice IC, Announcement system, Microcontroller, Display unit.*

1. Introduction

In the beginning of 21st century weather forecasting play an important role for human life. It creates a challenging prediction about the susceptible of the weather. These weather prediction based on the human algorithms which having certain inputs and valid outputs. On the basis of these weather forecasting patterns people can take precautions from various weather conditions and climate changes like heavy rain fall, strong wind flow, draught, and thunder storm etc. The weather forecasting announcement and display system has the capability which work on the low power. The feature of this project is very easy to understand for the farmers and illiterate people. This announcement and display system requires some few basic modules such as voice module, display module, microcontroller, and sensors etc.

The main motive behind taking up this project is the large utility of the weather announcement in varied areas ranging from agricultural growth and development to industrial development. The weather conditions of a field can be monitored from a distant place by farmers and won't require them to be physically present there in order to know the climatic behavior at the location by using this announcement system.

In this project microcontroller is interfaced with the LCD display, voice module, and sensors to display and announce the information of the forecasted weather.

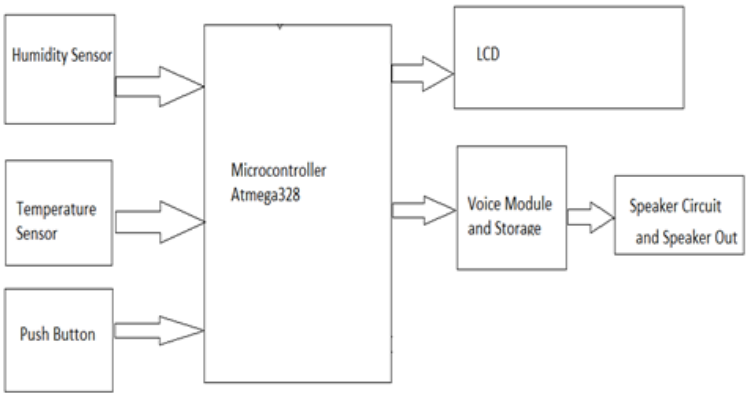

Fig 1.1: Block diagram of proposed model

2. Design Implementation of Proposed Model

Weather forecasting is the application of science and technology to predict the state of the atmosphere for a given location. Human beings have attempted to predict the weather informally for millennia, and formally since the nineteenth century. Weather forecasts are made by collecting quantitative data about the current state of the atmosphere at a given place and using scientific understanding of atmospheric processes to project how the atmosphere will change.

The proposed model plays a vital role, now-a-days, in agriculture. As it announces all the information regarding the weather conditions going to be happen in next few hours. And for this different components are used such as, microcontroller, sensors (like humidity sensor, temperature sensor), LCD, Voice module and speakers.

The Voice Announcement Module (VAM) is a printed circuit module contained in a standard Ascom housing. It provides voice announcement which identifies the selected channel in the teleCARE M system with entertainment. The VAM contains voice recorder chip, which is capable of storing the recorded voice message of up to 10 seconds duration. The recording can be repeated as many times as required.

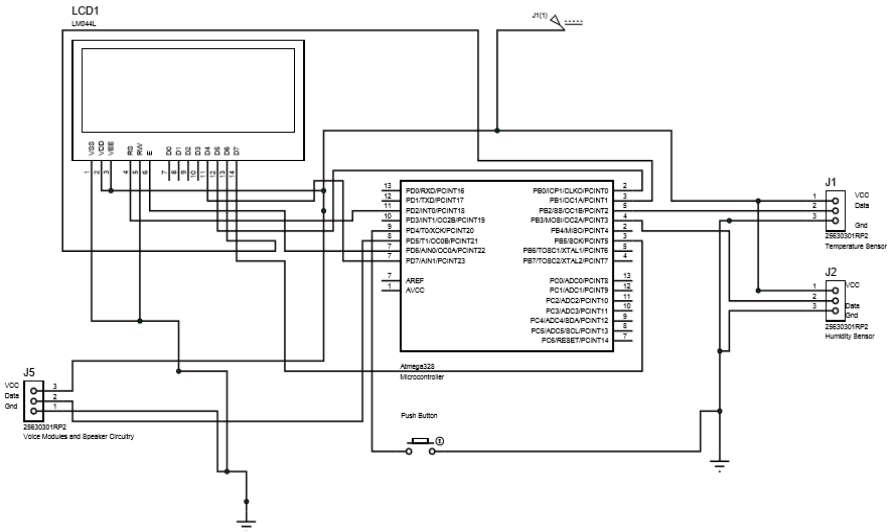

Fig 1.2: Circuit diagram

From the block diagram we can see that with the help of sensors the input is provided to the microcontroller. The sensors senses the weather conditions from the surroundings which are changing frequently. As microcontroller is interfaced with the sensors, the information gathered by the sensors will be matched with the stored database in the microcontroller. The database is made manually according to the last 10 years data of weather conditions. On the basis of the input received from the two sensors (which are humidity and temperature sensors) microcontroller provides the output to LCD

and voice module which use that information in different ways. LCD will directly display the received information. And voice module which has pre-recorded messages, according to the condition send the message to the speaker, which will announce it in Hindi.

3. Literature Review

Krishnappa et al. in [1] evaluated a new real-time application, known as CloudCast for short term weather forecasts which is location-based. CloudCast is based on the Nowcasting Algorithm and a new architecture that supports the execution of this Algorithm. The CloudCast architecture has two components: (i) Meteorological command and control (MC&C) [2] - controls radar scanning and cloud instances. (ii) Nowcasting Algorithm [3], [4] for short-term weather forecasting.

Barbhuiya and Liang in [5] implemented a multithreaded programming strategy in order to forecast the weather in parallel. Weather2 Ltd used a serial weather forecast model (WFM) where in the sequential programming was done. This problem was solved by evaluation of a new parallel WFM model with the multithreading. The performance after using multi-core systems having Hyper-Threaded technology was better and execution time was reduced providing weather forecast data in lesser time.

Pfaff et al. 1999; Goddard et al. 2001; Ziervogel et al. 2004; Lemos and Dilling 2007 highlight that forecasts have not been extensively embraced and their effective utilization has lagged behind, particularly among marginal groups. While the majority of farmers did not have access to timely weather forecasting and early warning information, this information is very important. The farmers need timely advance information in terms of the number of days it will rain, the rainfall amount during the cropping season, and the likely quality of the upcoming season.

Ziervogel et al.2004; In the present research, fewer respondents indicated that the information they received was reliable, rather the majority of respondents indicated that the information was only 'reliable at times'. It is vital to point out that the reliability of forecasts is dependent on both the skills of the forecast and the credibility of the source.

4. Comparison

Existing model	Proposed model
1. Weather forecasting done using GSM module.	1. Weather is forecasting with the help of sensors.
2. No announcement facility.	2. System announces the information in Hindi.
3. The system is costly.	3. The system is cost effective.
4. Internet access required.	4. Internet access is not needed.
5. System is time consuming.	5. Real-time system.
6. Design implementation is complex.	6. Design implementation is simple.

5. Applications

The proposed model has various applications. Some of them are:-

1. Agriculture field monitoring.
2. Home automation.
3. Industrial purpose.
4. Used in power plant generation.

6. Conclusion

This paper demonstrates the design and implementation of Weather forecasting announcement and display system used for announcing the information in Hindi as well as displaying it. This project is basically for rural areas, where major part is agriculture, and it is so much beneficial for local people. Embedded controlled sensor networks have proven themselves to be a reliable solution in sensing environmental conditions. The sensors have been integrated with the system to monitor and compute the level of existence of temperature and humidity in atmosphere using information and communication technologies. The sensors then proceed the information for further processing, and then the required information is received at output in the form of announcement and display.

7. Future Scope

Adding of more sensors to monitor other environmental parameters such as Soil PH Sensor, CO2 and oxygen Sensor while allowing the replacing of current sensors if a wider range of measurements is desired. And also Integration of additional monitoring devices such as a Wi-Fi camera to monitor growth of agricultural product. And also the data can be uploaded to web server continuously.

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