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"AUTOBOOK" The Messaging Machines (Using GSM and Arduino)
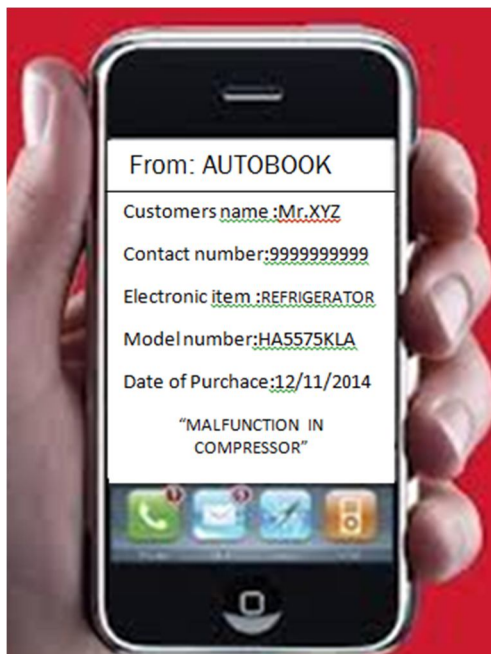
Vidya Sneha.V[1], Sadhve.V[2], Swathi.J[3]

Department of Electronics and Instrumentation Engineering Easwari Engineering College, Chennai.

Abstract: In a world that is advancing towards technological development in every second, 'time' has become very expensive. Incorporating automation in an existing complaint registering mechanism through networking is our main idea. The focus is mainly on handling malfunctioning of a device in a more optimized manner in terms of time, cost, service and transparency by making complaint booking user friendly.
The malfunction is detected by a sensing element which is placed at different ends of the system where errors are prone to occur. The output of this sensing element is given to Arduino board. This in turn controls the Global System for mobile communication (GSM). The GSM sends a message to the owner and service station regarding the malfunctioning of the machine.

I. INTRODUCTION

The need for service of any machine or electronic gadget is never ending. Booking a complaint for rectifying the machine is yet another problem. For illiterate people, it is quite difficult to undergo the steps in complaint booking through IVRS (Interactive Voice Response System) that is currently used. Another task is finding out where exactly the fault is. This takes time for a service man, as he ought to examine the machine completely to locate the problem and then rectify it.

"AUTOBOOK" overcomes the above problems. The system automatically detects the malfunctioning of a machine and sends a message to the service centre about the details of the owner, purchase, specifications of the machine and where exactly the fault occurred. Thus, it reduces the labour and time required to locate the fault. Another message is sent to the owner regarding failure of the machine.

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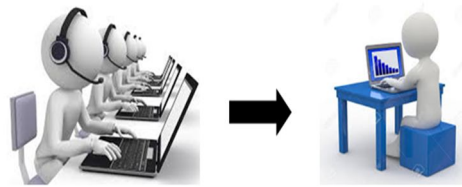

Fig 1.1 Reduction in labour of complaint booking

Installing this system while manufacturing the machine will be cost effective, as it would create more demand for the product in consumer market. Managing multiple calls at the customer care centre require many employees and increases the complexity of the network. Whereas in this mechanism, only the received messages are monitored and services are done as per their needs and convenience, thus reducing the time consumption, labour and electricity that is required for the whole process.

II. COMPONENTS OF AUTOBOOK

There are three main blocks for "Autobook". They are:
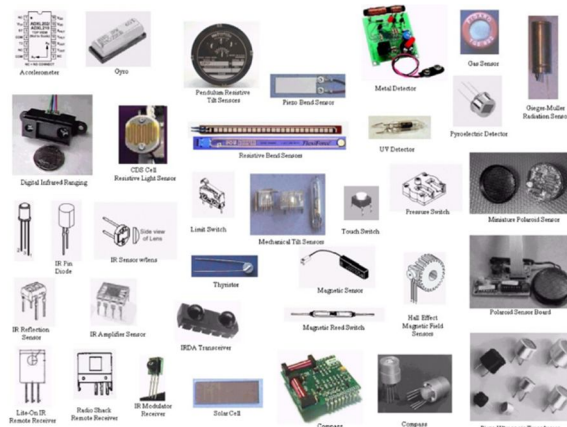
A. Flaw sensing element

Fig 2.1 various sensors that can be used

The flaw detecting element is a sensor that is used to monitor any parameter like temperature, pressure, voltage, current or anything that is of our concern depending on our requirement [1]. Based on this, the appropriate sensor is chosen. Since the measure of these parameters is unnecessary, precise sensors need not be used thereby making it cost effective.

B. Arduino Board

Arduino is a simple microcontroller board and open source development environment that allows you to make computers that drive both functional and creative projects [2]. The Arduino board is the control unit of Autobook and brain of the system.

C. Global system for mobile communication

A GSM modem is a specialized type of modem that accepts a SIM card [3]. A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves

It helps in networking of our system by short message service(SMS).

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III.   WORKING

The parameter to be sensed is given as the input to the appropriate sensor. Output of the sensor is generally in voltage. This is fed into the Arduino board which is designed using Arduino software to identify whether anything has gone wrong in its functioning, based on its input. If the result is positive, it will activate GSM and send message about the component that is faulty and other details about the machine and owner to the customer care centre. A message is also sent to the owner about the problem.
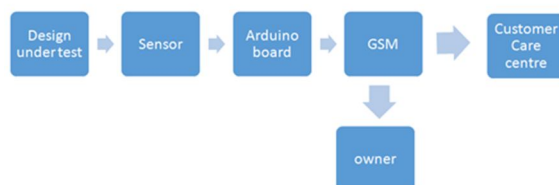

Fig 3.1 Working of the AUTOBOOK

The above block diagram depicts the flow of control across the total system. Design under test is the machine whose fault is to be detected. The sensor is employed to detect or identify whether that particular component is working or not[6]. The output is fed into Arduino board which has a fixed reference value for proper working of machine. The Arduino checks whether the machine is working in proper condition, based on the   pre-defined code and the input. The Arduino instructs the GSM[5] to send the message only when the input deviates from this reference value. The GSM then sends a message to the programmed mobile numbers given to it. If the input satisfies the conditions for proper working of the component, nothing is done.

IV.   PREREQUISITES

A.   Power supply must be given separately to Arduino board and GSM [4].
B.   This is necessary, since the automated message sending system must operate without any hindrance even when there is some problem with the working of the machine where it is installed.
C.   SIM card from an existing provider is also necessary to send SMS.
D.   Complete analysis of the Device under Test (DUT), to decide the type of sensor and its specifications.
E.   Arduino software to program and design the system based on the device and requirements.

V.   ILLUSTRATION

Fig 5.1 Simple Illustration

The above picture shows a simple connection of motion sensor to Arduino board, which is designed to activate GSM when the motion of some foreign element is detected by the sensor and gets reflected in its output. It is assumed that motion of elements in the vicinity of the sensor is undesirable and will spoil the working of the system. Hence, GSM gets activated accordingly and sends relevant message to the loaded numbers

39

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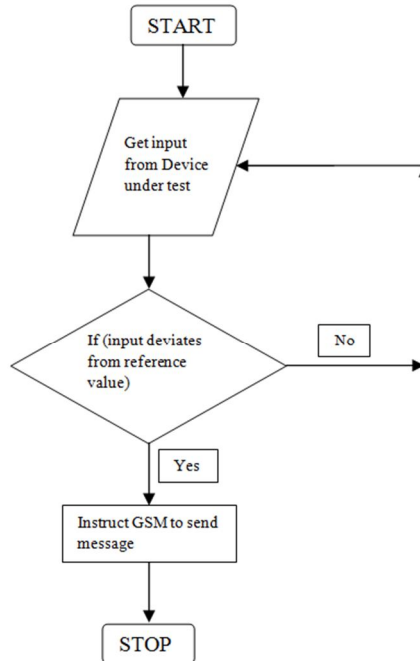

Fig.5.2 Flowchart

For practical utilisation of Autobook, the motion sensor is replaced by required sensors. The output of these sensors are given to the Arduino board. This will instruct the GSM according to the inputs received from the sensor.

VI. CONCLUSION

A. *Advantages*

1) Time consumption is less compared to the present system (IVRS).
2) Cost effective.
3) Optimized use of electricity as low voltages is sufficient to trigger the system.
4) Reduced complexity in networking.
5) Labour requirement gets reduced.
6) More users friendly.
7) Transparency in service
8) Beneficial for illiterate users.
9) Flexibility to change the software alone and reuse the setup elsewhere.
10) Accuracy and efficiency of service increases.

B. *Drawbacks*

1) Initial installation of the system for every machine would be quite costly
2) Sensor to be used varies for different machines and circumstances.
3) Requirement of separate supply connection to Arduino board.
4) A separate sim is to be provided for the working of GSM.

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"Automation" is exploited in every domain of application to reduce labour and increase efficiency of work. We strongly believe that, when it is combined with "Networking", it becomes more advantageous and beneficial. Registering a complaint is a hectic process as one must spend answering vague questions regarding the machine and the failure, which is not comprehensible for an illiterate. There are many instances where one does not even know what is wrong with the machine, but just end up saying "Machine needs to be serviced. Something is wrong!". The whole scenario changes if "AUTOBOOK" gets implemented. It is universal and hence can be used by anyone. Reliability of service also increases. Service would be offered at the doorstep avoiding these intermediate troublesome processes. Let us pave way for "Messaging Machines" of the age!
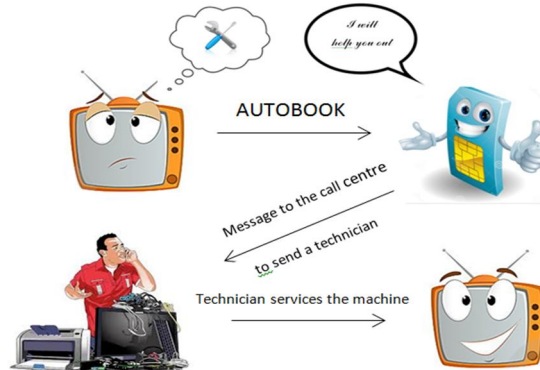

Fig 6.1.Automated Complaint Booking by AUTOBOOK

VI.   ACKNOWLEDGEMENT

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