Banking Security System Using PSoC

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Abstract: Automation is the need of Twenty first century. New technology innovations give the better solutions to our everyday life. Banking system is one of the important social systems. So it needs more advanced security system. Programmable System on Chip is one of the advanced technological innovations. This technology is used here for implementation. Two phase detection algorithm is developed for implementation. Motion detection sensor will detect an unwanted motion in bank locker room. IR proximity sensor will detect further motion and differ it to the human motion or robotic motion. This will come in second phase detection. PSoC chip will detect this input signals and according to that it will send message via GSM module to the respective person. Other system activations also will take place such as door locking system, poisonous gas release mechanism etc. We can implement such kind of output via relay module. This system is tested with output as buzzer and GSM message and found working properly.

Keywords: PSoC, IR Proximity, GSM, Two phase detection.

I. INTRODUCTION

New technology gives the new and better solutions. Using new technology lead to high accuracy, quick response etc. Banking is one of the important social organizations. So we have to make sure that it is safe because it deals with financial relations. Following some of the examples will give the week security systems.

Vincent Van Gogh's "Poppy Flowers" also known as "Vase with Flowers" was stolen in October 2010 from Khalil museum Cairo, Egypt. After investigation it found that the security cameras and alarms were not working. None of the alarms at Khalil museum and only seven out of 43 security cameras was working [1]. On Monday, August 21, 1911 the world's most famous work of art Leonardo da Vincis Mona Lisa was stolen from the Louvre museum in Paris. That painting was stolen by Italian man named Vincenzo Perugia. He spends whole Sunday night in museum. This happened due to the low security system. Same condition is there in banking security systems. By 2001, 98 percent of robbed branches had both cameras and alarm system. As we can see Hollywood films that how they crack banks and other security systems. This is some drawbacks of various systems.

II. LITERATURE REVIEW

If we see the previous security systems, we can notice that these systems were based on different parameters. Camera detection, biometric authentication etc. Different processors were used for implementation.

A. Security Camera Based System

Many of the security systems consist of security camera. One person need to monitor continuously these cameras. This system is based on ARM processors or MATLAB based image processing based etc. It is having some of the drawbacks as follows:

- Need to monitor continuously.
- High maintenance cost.
- No quick response.

B. Biometric Authentication Based System

Biometric authentication systems were also good enough when it was invented. Based on fingerprint authentication, speech recognition, iris recognition etc. This system needs highly complex task executer processors such as ARM, FPGA etc. But later on this system also vanished from market. Still this system is implemented with other security system integration. Biometric security systems have some drawbacks as high maintenance cost, high hardware cost. Due to this the biometric authentication system implementation rate decreased. We can see the total usage of biometric security systems in overall security systems.

	Biometric Trait		
	2002	2003	2004
Iris	5.8 %	7.3 %	9 %
Fingerprint	52.1 %	52 %	48 %
Face	12.4 %	11.4 %	12 %
Other	29.7 %	29.5 %	31 %

Table 1. Biometric Authentication System Review

III. PROPOSED SYSTEM

The proposed system works on two phase detection algorithm. PIR motion detection sensor works in first phase detection. IR Proximity detection works in second phase detection.

A. Hardware Setup

PIR Motion detection sensor and IR Proximity detection works as input to the system. PSoC 4 CPU receives the input from these sources. Next to that is the output

processing. SIM 900 GSM module is used to send message. Relay circuit is interfaced with PSoC 4 IC. This is the basic structure of proposed system block diagram. Following figure shows the block diagram.
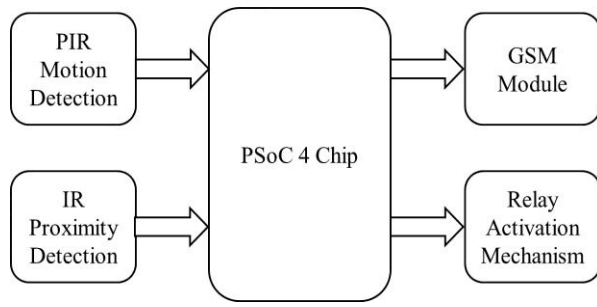

Fig. 1 Block diagram of proposed system

B. Software Development

The PSoC Creator IDE is used to develop our code. The advantage of PSoC Creator is that we can use predefined functions with different blocks. We used Cap Sense block for IR Proximity detection. PWM block is also used which pre-defined. Next to that UART module is used to interface it with GSM module. Let's discuss the execution flow. First system initialization takes place. Next to that all input will get set to its initial configurations. Now the system continuously checks for input signals. If PIR motion detection sensor detects any motion then it trigger the input signal and send it to the PSoC 4 IC. Then a message will send to authorized person via GSM module. Next the same procedure will be for second phase execution. If IR Proximity detection occurs then it will trigger input signal. Then PSoC 4 IC will send message to authorized person. Relay circuit gets activated. We can interface the different mechanisms as per our application such as door locking mechanism, poisonous gas release mechanism etc. Our aim was to activate the relay module. The below figure shows the block representation of our code. There are different codes implemented at the back side of this block. We can see different blocks implemented over there in diagram. The separate C code is developed to create relationship between them and to give the proper system output.
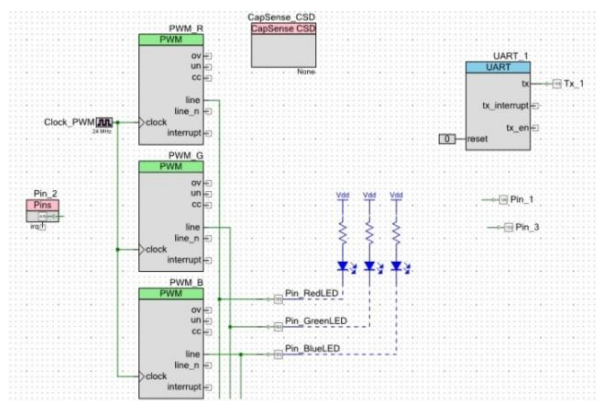
IV.RESULTS AND CONCLUSION

When we tested our system it gave the proper results. The first motion detection occurs and then IR Proximity detection takes place. Both detection works independently for intruder detection. Message received properly after detection. Relay circuit activation triggered. The primary output current measured was 5.5 mA for relay activation. Voltage supply was 5V. According to that power consumption was 27.5 mW. We can conclude that proposed system works properly with two phase input blocks. It sends automatic notifications. The proposed system works at different working environments.

V. FUTURE WORK

Proposed system describes different processing modules for security. We can define our system for particular application. The extreme development in IR antenna will lead to large range of IR Proximity detection. Relay activation system can be interfaced with different mechanisms for different applications.

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Fig. 2 Programming representation