**Development of IoT based Smart Security and Monitoring Devices for Agriculture**

**ABSTRACT**

Agriculture sector being the backbone of the Indianeconomy deserves security. Security not in terms of resources only but also agricultural products needs security and protection at very initial stage, like protection from attacks of rodents or insects, in fields or grain stores. Such challenges should also be taken into consideration. Security systems which are being used now a days are not smart enough to provide real time notification after sensing the problem. The integration of traditional methodology with latest technologies as Internet of Things and Wireless Sensor Networks can lead to agricultural modernization. Keeping this scenario in our mind we have designed, tested and analyzed an ’Internet of Things’ based device which is capable of analyzing the sensed information and then transmitting it to the user. This device can be controlled and monitored from remote location and it can be implemented in agricultural fields, grain stores and cold stores for security purpose. This paper is oriented to accentuate the methods to solve such problems like identification of rodents, threats to crops and delivering real time notification based on information analysis and processing without human intervention. In this device, mentioned sensors and electronic devices are integrated using Python scripts. Based on attempted test cases, we were able to achieve success in 84.8% test cases.

**INTRODUCTION**

Over the past years information and communication tech-nologies have been introduced in agriculture, improving food production and transportation[1]. However the integration of these technologies are not yet used for security puposes. The significant challenge facing the security in agriculture is the interaction between security devices and to provide them intelligence to control other electronic devices such as cameras, repellers etc to enhance security in various fields. For example, a basic CCTV camera installed in a grain store cannot be of use until recorded media is accessed and it also cannot process the information about what is happening at particular location. In implementation and adoption of information and communication technologies, cost is also a major factor. It is not easy to achieve exchange of information among devices and upgrading their functionality while keeping their cost to a reasonable level [2]. So, the natural conclusion is that the security and monitoring systems must be responsible for transmitting data over network, analyzing the information and notify the user with real time information of surroundings

REFERENCES

1. Nikkila, R., Seilonen, I., Koskinen, K. 2010. ‘‘*Software Architecture* *for Farm Management Information Systems in Precision Agriculture.*’’Comput. Electron. Agric. 70 (2), 328-336.
2. Alexandros Kaloxylos, J Wolfert, Tim Verwaart, Carlos Maestre Terol, Christopher Brewster, Robbert Robbemond and Harald Sundmaker. ‘‘*The Use of Future Internet Technologies in the Agriculture and Food* *Sectors: Integrating the Supply Chain*’’ in 6th International Conferenceon Information and Communication Technologies in Agriculture, Food and Environment. pp. 51-60
3. Kevin Ashton, ‘‘*That Internet of Things thing*’’ RFID Journal, It can be accessed at : *http://www.rfidjournal.com/articles/view?4986*
4. D. Singh, G. Tripathi, A.J. Jara, ‘‘*A survey of Internet-of Things: Future* *Vision, Architecture, Challenges and Services* in Internet of Things (WF-IoT), 2014
5. ‘‘*Gartner, Inc.* ’’ It can be accessed at: *http://www.gartner.com/newsroom/id/2905717*.
6. Malik Tubaishat, Sanjay Kumar Madria ‘‘*Sensor networks: An* *Overview*’’, IEEE Potentials 05/2003.