An Improved Algorithm for data cleaning of RFID and WSN Integration: A Review

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Abstract— **In recent year , RFID technology, by of rights of its features such as flexibility , speediness and wireless identification gradually attracts the people attention and have a wide variety of application in current and future system .Both RFID & WSN systems give better infrastructure for data acquisition , distribution and processing . therefore RFID and WSN system represents two complementary technologies . A five layer system architecture has been proposed to give the synergistic performance .In this paper, there are multiple sensor and RFID node are placed so changes of data redundancy to overcome this difficulty data cleaning is achieved by using customized data cleaning algorithm**.

IndexTerms—**Wireless sensor network, Radio frequency identification, integration system, data cleaning.**

I. INTRODUCTION

Radio Frequency Identification (RFID) is a technology for identifying objects or humans automatically with the use of radio waves. The main components of RFID are the tag and reader .The improved cross-redundant data cleaning algorithm that will be given to eliminate redundancy data effectively and to improve the efficiency of data communication. The next revolution in computing technology is the widespread use of small wireless computing and communication devices that will integrate seamlessly into our daily life. Therefore, in the near future we can expect the use of lots of devices such as tags, sensors, and readers etc. to grow by many orders of magnitude. From a technology perspective, RFID and sensor networks are important components of this paradigm, since both technologies can be used for coupling the physical and virtual worlds, usually known as pervasive computing .WSNs are networks of small, cost effective devices with sensing, data processing, and communication ability. WSN are being used for several applications ranging from military surveillance to habitat monitoring.

In these applications, WSN are just sensing the environment and sending data to a base station. Therefore, they are not providing any contextual information. However, integrating the WSN with RFID provides context to the sensed data. This integration has facilitated our lives in many areas such as supply chain management, health care, tracking and monitoring of objects and humans. RFID technology was developed to replace traditional barcode systems. It consists of reader, tags, and applications. Readers read the tags attached on objects, store data in their memory, and the applications access it. Existing RFID technology does not support multi-hop communication from reader to reader. By integrating it with WSN, we can route RFID data from readers to base stations/servers/applications by using existing sensor network protocols. For this, nodes can have both functionalities: sensing and reading.

II. LITERATURE SURVEY

The objective of the research by authors is to develop a seamlessly integrated information management framework that can provide logistics information to project stakeholders for their decision making. The pilot test of the framework developed in this research showed that it can improve time efficiency by about 32% compared to the traditional supply chain management. The result of this research is expected to be utilized effectively as a basic framework to manage information in RFID/WSN based construction supply chain management (CSCM) environments [1].

The data from RFID is generally unreliable by nature; the rate of the acquired data is around 60%−70%. To obtain sufficient data, readers in the WSN interrogate tags periodically. While the issue of reading rate can be addressed, it leads to a new issue of duplicated readings; it can be a severe issue when the sensor nodes are densely distributed to ensure no area is missed between neighboring nodes. Transmitting duplicated data to data server causes the waste of energy, time delay, and other network resources[2] .

Authors developed algorithms to address the problem of unreliability of RFID data caused by data leakage and repeated readings; the problem of data redundancy has not been tackled. discussed the problem of redundant data; he suggested cleaning data by keeping inspection and silence of redundant readers. However, the proposed algorithm for detecting the device of redundant readers cannot avoid the fact that many readers have to work together at the same time.[3]

RFID and WSNs represent two complementary technologies. RFID is widely used to identify, detect, or monitor objects. In comparison with other types of sensors, the low cost is the superior advantage of RFID; however, RFID is incapable of providing the detailed information about the conditions of objects. On other hand, a WSN can integrate logics into RFID nodes and allows an RFID system to operate in a multi-hop fashion and with the detailed information about the nodal conditions [4]

T. S. Lopez et.al , D. Kim et.al , G. H. Canepa et.al, and K. Koumad et.al Proposed a method to integrate RFID and WSN as an infrastructure for telecommunication. The tasks involved in the integration of WSNs and RFIDs are to design or select: RFID tag memory; WSN association protocols; routing and addressing schemes; RFID sensor-actuator data integration and management; service definition and delivery; context and service matching; and distributed middleware.[5]

III. PROPOSED WORK

Radio-frequency Identification (RFID) is the small electronic wireless device which use electromagnetic fields to transfer the data and for automatic identification of objects with a unique ID number which is stored in attached tag. It consist of reader and tag i)Reader: It the two way communication device for reading and writing in the tag ii)Tag: It has two component one is antenna and other one is microchip; Antenna determines the reading range of RFID and transfer the data to the reader and microchip use to store the incoming data.

Fig.: Working principle of RFID

Wireless sensor network (WSN) consist of number of nodes .a sensor nodes communicate among themselves using radio signals. It is the network to sense the and monitor the physical ,chemical and biological environment through sensing temperature ,light and sound a sensor node has ability to collect sensed environmental condition. RFID and WSN both are the important component use in wireless technology. Usually sensing and monitoring the environments are performed by the WSN's and in other hand RFID commonly used to track the objects where tag is attached. RFID technology has some disadvantages is that low tolerance to fluid or metal environment. The advantages of WSN over RFID is that a sensor enable RFID to push reader into nodes to enable readers or tags.Data cleaning is the process of removing corrupt or inaccurate data from data list or table. The main process of data cleaning is to removing errors or validating and correcting data against a known list of entities. The nature and rate of RFID data is not so good it means to unsatisfied or make error by nature. To obtain sufficient data, readers in the WSN interrogate tags periodically. . It is desirable to clean data at the level of sensors and data warehousing to eliminate the redundant or unreliable data. To overcome this problem, Integration of RFID and WSN using improved cross-redundant data cleaning algorithm (ICRDC) for the performance factors such as compressibility and accuracy on the basis of no. of readers and no. of tags. In a RFID system, a reader can scan multiple tags simultaneously. In WSN, as there are multiple sensors and RFID node are placed so there is more chances of data redundancy .the redundant data will be taken into consideration to improve the efficiency of data communication hence we have to improved the data cleaning algorithm. and also to overcome this difficulty data filtering is required. To achieved this aim by using customized ICRDC algorithm. To improved   the compressibility and accuracy with the help of factors affiliation ,signal intensity and Euclidean distance from ICRDC algorithm. So, a comprehensive and efficient improved cross-redundant data cleaning algorithm using the correlations of time and space among readers and tags is proposed.

Here, the issue related to redundant data will be specially taken into consideration to improve the efficiency of data communication. A new data cleaning algorithm is presented.
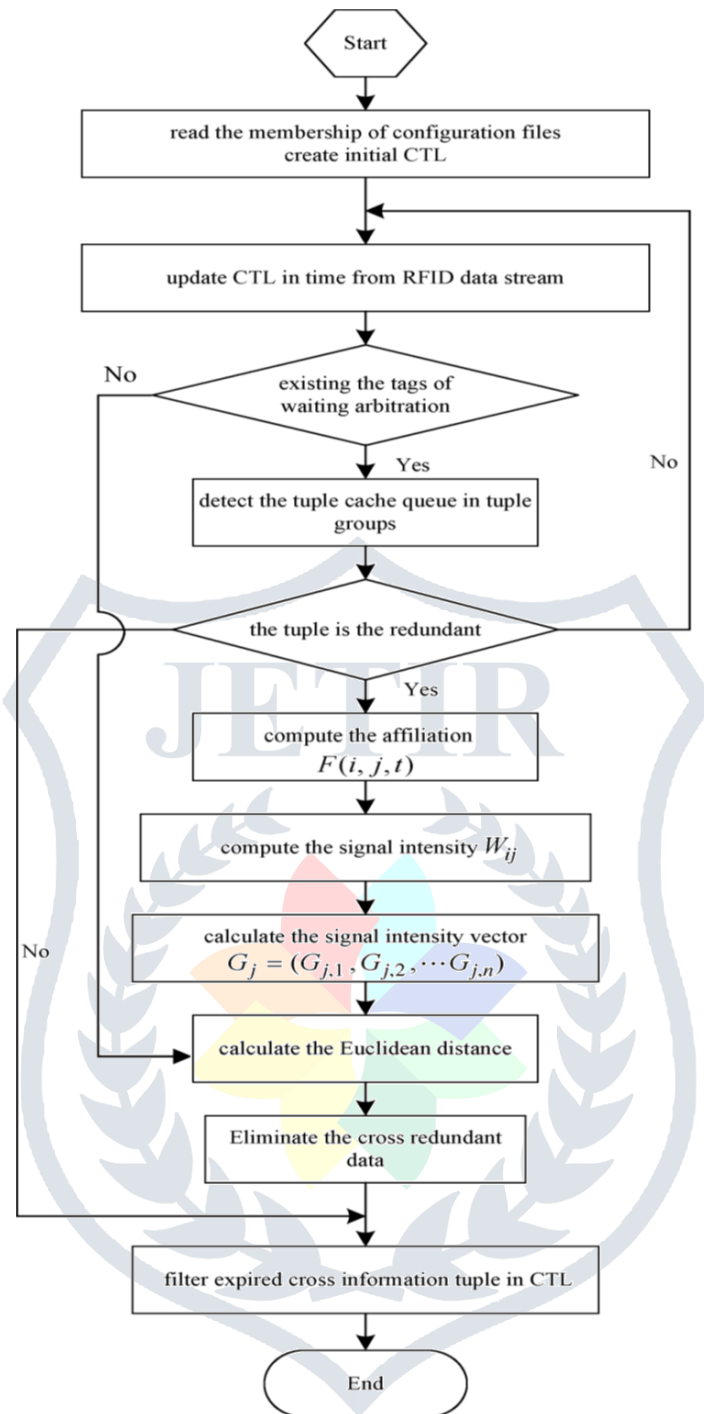
Fig. Flowchart of ICRDC

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