Generic Components to Monitor and Measure Assets/Resources using Location Awareness.

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Abstract

Radio Frequency Identification (RFID) has emerged as a key technology for real time-assets tracking. This system is mainly concerned with the administration of resources at the best level.

This system is absolutely generic in actual meaning. Users of this system will be able to administrate critical assets. Tracking of the resources/assets will be done using new emerging technology **RFID**.*Assets will be administered against Time bound & space bound constraints as well.*

Index Terms – RFID, transducers, readers, active & passive tags.

Introduction

Ubiquitous computing systems should be able to perceive their periphery in order to apply the CALM technology concept discussed in (Weiser & Brown, 1997) where users move their attention from their central activity to the periphery as needed. Thus, location awareness becomes a key issue to be taken into account when focusing the attention. So, the more accurate the location perception is; the more reliable the decision to focus the attention it is.

One advantage of this System is the ability to work under harsh environmental conditions (for instance, ultrasound sensors have problems with noise and IrDA have problems with light).They also have a fast response time and the cost effectiveness, life time and low maintenance are some important benefits (using passive tags) because no batteries are needed. Some examples are given in Miller et al. (2006), Ni, Liu, Cho, and Patil (2003) Patil, Munson, Wood, and Cole (2005).These systems use RFID as a supporting or calibration system, secondary to main technology (radio frequency, INS, etc.). Instead, this system is completely based on passive RFID technology.

Problem Statement and Synopsis

All the levels of the organizations have to deal with the assets/resources related to their fields. Most of the organizations' "center of challenges" is how to administrate plethora of assets so precisely?

Here is the most feasible solution for all those organizers. RFID, a far better and emerging technology than barcode & any other tracking technology. In this system each and every assets that are needed to be tracked in a real time are attached with RFID tags. RFID readers are set over the coverage area. Now feel relax!! **The real time path of the assets and time spent at particular location will be tracked & compared with the ideal path & ideal time stored In to the database**. No of your assets are going to be off-tracked. Administration will be that precise.

This system will be accessible by,

1) MOBILE and
2) DESKTOP

As well.

Indoor Location System Based on RFID

The system I propose is capable of tracking autonomous robots within a closed environment based on passive RFID technology. Spaces to be sensed (i.e. rooms, halls, etc.) are composed of sensing surfaces.

Sensing surfaces are physical surfaces where autonomous entities can be located (i.e. floors, walls and even tables) within a space. A sensing surface is divided into a grid of small squared surfaces or location units. A location unit represents the minimum unit of location of the system defining the system resolution (as a pixel does in a screen). Location units have a unique identification code (ID) that provides the system with the capability of identifying spaces uniquely by Mapping this identifier to a small physical surface.

Components Used

- An antenna or coil
- A transceiver (with decoder)
- A transponder (RF tag) electronically programmed with unique information.

Components of an RFID system

- **RFID Tag**: consists of a microchip with data storage, limited logical functionality and an antenna which is tuned to receive radio frequency waves emitted by a reader or transceiver for allowing wireless transmission of data to the reader. For retail applications, the identifier takes the form of an Electronic Product Code (EPC).
- **RFID scanner/readers**: It usually consists of a radio frequency module, a control unit and a coupling element to interrogate the tags via radio frequency communication. Readers are usually connected through middleware to a back-end database.
- **RFID Middleware**: This refers to specialty software that sits between the reader network and the true application software to help process the significant amount of data generated by the reader network.

RFID in assets tracking

- RFID (Radio Frequency Identification) is a groundbreaking technology for tracking valuable assets.
- Now there is no need to store whole history and full description about them every time.
- RFID tags are the simpler way to track them.
- Every tagged asset can be tracked by interpreting the upcoming radio signals from each tag.

Working (modules)

- **Steps for Installation of Asset Tracking with RFID** Following are some simple steps to install an asset tracking system with RFID.
- **Connect the reader and dump the useful data into a database:** The first step is to design an create a database like MS access which contains the custom fields, like, cost of the asset, its owner, and serial number. This helps in the easy updation of records and retrieval of information when required.
- **Tag the Assets**: After the excel sheet has been made, the next step is to properly tag the owned assets. It is important to figure out the required types of RFID tags, as different assets need different tags.
- **Place Records on the Desired Asset Tracking System**: There are many brands of RFID asset tracking systems in the market, so one should be sure about his requirements and budget before deciding upon a particular brand. The speed of these systems is measured in tags per second. A greater speed ensures higher efficiency, which in turn is bound to be more expensive than others. The excel sheet is updated after every scan and it stores the last scan date and time. Missing data can be easily found out by looking the database.

Uses

Asset tracking can help businesses by:
- Reducing the loss of equipment and size of equipment inventory.
- Improving customer service by making it possible to locate the closest clerk when needed.
- Accelerating reaction time for an event needing a quick response.
- Enhancing patient care by helping staff quickly find the required device.

Requirements

Platform used: Java

Kit used: RFID Engineering kit

Possible Domains

- **Clinical trials on animals and humans to track their activities with controlled environment**
- Hospital : newborn tracking/general patient tracking
- Labs : specimen tracking
- **Garden Therapy**
- Attendance tracking in any industrial organization
- Pets tracking
- Retail store items tracking
- Amusement park : children tracking

Conclusion

Practical RFID systems are involved in real time tracking and monitoring of events.

- Our asset tracking products enable you to instantly determine the general location of tagged objects anywhere within a defined space.
- Asset tracking allows you to monitor location, status and availability from virtually any location in your extended operations; manage your assets on demand by knowing where they are and boost production by getting your assets where they need to be without delay.

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