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Department of Electronics and Communication Engineering

HX8001 - PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

SMART SOLUTIONS FOR RAILWAYS

Domain of the Project :Internet Of Things
Batch ID : B12-6A2E
Team ID :
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Objectives

- The main objective of the project is to provide a increased efficiency and passengers experience in railways.
- IOT technologies help railways successfully manage passengers safety, operational efficiency, and the passengers experience.
- Smart sensors are used to track the important assets , manage passenger flow, and enable predictive maintenance.

Abstract

- Railways have been an essential mode of transportation to people all over the world for centuries.
- Today, railways are more important than ever as country and city governments are being asked to find innovative ways to safely get back to business post-COVID.
- There are many types of smart devices that enable IOT in railways, such as vibration and temperature sensors, vehicle and station cameras, digital signage, machine learning libraries, security systems, and more.

Introduction

- Railway operators around the globe are implementing IT-enabled solutions to create intelligent, connected railways today.
- Safety sensors can be added to critical components of the train, such as breaks and wheels, to help alert operators of any issues.
- Computer vision solutions can help enable automated and safe platform and train screen door systems or help detect when passengers slip and fall.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Research and Analysis on the Top Design of Smart Railway	Shaofu Lin & 2017	International journals of Electrical and Computer Engineering (IJECE)	The top-level design is a macro-plan that affects the subsequent development of the smart railway. In the future, it should be updated and improved in real time according to the development of the smart railway, providing powerful guidance for the information development of the railway.
Smart railway automation system using IOT- a literature survey	Dr. A. Benjamin Joseph & 2018	International journal of current engineering and scientific research (IJCESR)	By using this vehicle for the purpose of Railway track inspection and crack detection and automated SMS will be sent to pre-defined phone number whenever the vehicle sensors detect any crack or deformation.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Internet of Things for Smart Railway: Feasibility and Applications	Yong-Kyu Kim & 2018	Institute of Electrical and Electronics Engineers (IEEE)	To deduce the potential and feasibility, the network architecture of IoT solution and evaluate the performance of the candidate radio access technologies for delivering IoT data in the aspects of power consumption.
Smart Railway Maintenance – Challenges and Research Directions	Marilia Curado & 2020	International journals of Electrical and Computer Engineering (IJECE)	This paper identified and described the key requirements and approaches to SRM, from the points of view of infrastructure maintenance,railway vehicles maintenance, and global system maintenance.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Application of smart computing in Indian railway system	Asokh Nath & 2017	International Journal of Scientific Research and Management Studies (IJSRMS)	The smart model approach for passenger reservation system depends on some pre-requisites, without which the benefits would not be fully enjoyed. This includes the comprehensive UID registration of all passengers who needs to travel.
Smart Railway solutions	Ekaterina KOZYREVA & 2021	Indonesia Journals of Innovative and Research in Science	In this paper, the authors have explored different issues of implementing smart computing in railway systems pertaining to reservation models besides pointing out some future scopes of advancement.

Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
5G Key Technologies for Smart Railways	Markus Rupp & 2020	Institute of Electrical and Electronics Engineers (IEEE)	This paper explored a potential solution by leveraging emerging 5G technologies to provide a plethora of services in HSRs, both control and data services. More specifically, we first briefly described the current trend of wireless communications for smart railway.
Internet Of Things for Smart Railways	Arghya Biswas & 2019	Institute of Electrical and Electronics Engineers (IEEE)	The IOT is the key enabling solution to the CBM to enhance the efficiency of the maintenance. In some railway area already start to use the GSM-R technology for communication. But they are also faraway from lOT solution.

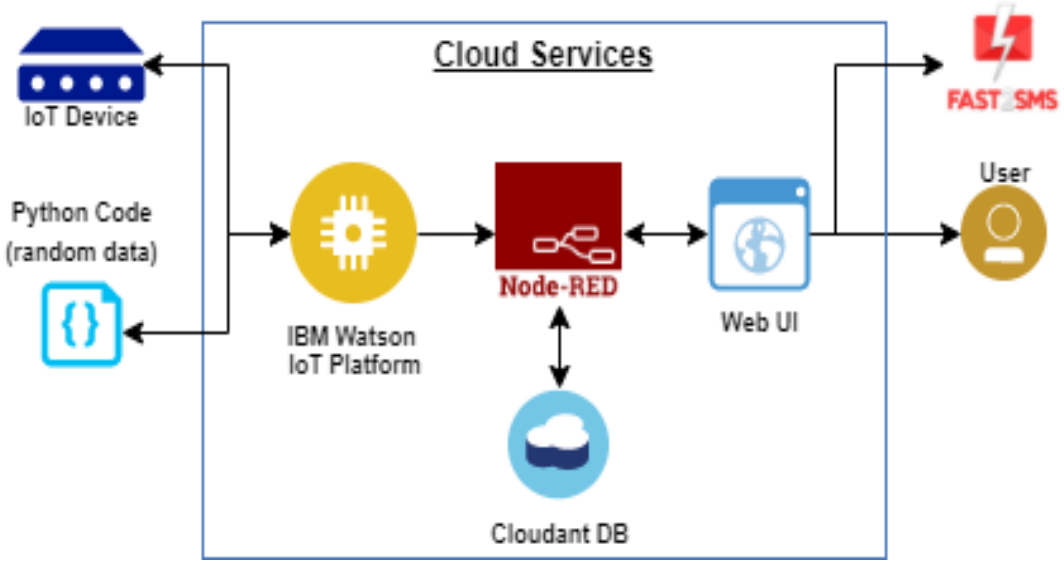
Literature Survey

TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
A Novel Design of Smart Train	Abishek Gupta & 2018	Institute of Electrical and Electronics Engineers (IEEE)	This includes the comprehensive UID registration of all passengers who needs to travel. IoT data in the aspects of power consumption.
Internet Of Things(IOT) and Indian Railways	Rajnish Kumar & 2016	International Journal of Scientific Research & Management Studies	The role of purchase department can be limited just to give the purchase order, the balance work can be handled by intelligent systems. When the network has information on consignments, stock position etc.

Problem Identification

- We examined the connection between railway - as critical infrastructure - and intelligent systems. Our article provides guidelines for the development of a smart network from both theoretical and practical point of view.
- In this project sensors are used to find the distance with the help of microcontroller all the data are collected and provide the required information to the user here the transmitting and receiving antennas are used for arrival and departure detection of train.

Block Diagram



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9. Abishek Gupta. “A Novel design of Smart Train.” Institute of Electrical and Electronics Engineers(IEEE),2018.
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Questions & Discussion

THANK YOU