VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY

ELECTRONICS AND TELECOMMUNICATION BRANCH

TECHTRONIX

HACKSPHERE PROBLEM STATEMENTS

S.NO.	THEMES	PROBLEM STATEMENT	Description	HARDWARE/ SOFTWARE
1.	Smart Education	**Comprehensive Educational Empowerment System For Rural Areas**: Design and develop a Comprehensive Educational Empowerment System for Rural Areas.	Create a user-friendly software system that should include features like interactive digital lessons, teacher training modules, and a communication platform to connect teachers, students, and parents. Ideate and implement a system to enhance the quality of education in rural areas. The aim of the system should not only focus on increasing the literacy rate but also should assist to elevate the communication skills and knowledge of the targeted society. The system should offer : * Study materials and mentor access. * Monitoring skill progress * Bridge the digital divide * Provide information about grants, loans and incentives. * Offer connectivity to financially disadvantage patrons. * Help individuals with employment opportunities. * Research and development * Access to material resources	Software
2.	Smart Automation	**Water and Electricity Tracking App:** Develop a user-friendly mobile application/website that allows individuals to easily track and monitor their water and electricity consumption. This app/website should provide real-time insights, set consumption goals, and offer tips on resource conservation.	A mobile application that helps you limit your water and electricity usage to a predetermined goal by outlining the behavioural change that would be required to meet those targets. Behavioural nudges ought to be embedded in the user experience based on deep research about the best practices of efficient water and electricity usage from around the world.	Software

3.	Clean & Green Technology	**Domestic Waste Management**: Create a simple and user-friendly application or system that helps households manage their domestic waste effectively.	Create an intuitive mobile application/website that empowers individuals to effortlessly monitor and manage their water and electricity usage. This solution should offer real-time insights into consumption patterns, enable users to set personalized consumption goals, and provide practical tips for resource conservation. By fostering awareness and responsible consumption, the application/web platform aims to contribute to sustainable living and environmental conservation.	Software
4.	Smart Automation	**E-Waste Facility Locator**: Create a simple app/website that helps people find the closest place to recycle their electronic waste.	Website that tells you the location of the nearest e-waste collection and recycling facility. Offers educational pop-ups on the harmful components of your e-waste and their effects on the environment and human health if not disposed correctly. There could be an option to input the model of your old device and earn credit points relative to the amount of precious metals recovered from the device if disposed correctly.	Software
5.	Disaster Management	A mobile app that crowd sources water-related problems from around a community, open sources data, etc. and display them on a map.	Create a user-friendly mobile app/website designed to crowdsource and map water-related issues within a community. By encouraging citizens to report problems and integrating open-source data, the platform dynamically displays these concerns on an interactive map. This solution enhances community engagement, facilitates transparent information sharing, and empowers both residents and authorities in collectively addressing and resolving local water-related challenges.	Software
6.	Smart Automation	Develop specialized network slices for healthcare services, supporting applications like remote patient monitoring, telemedicine, and healthcare IoT devices with stringent requirements for reliability and security.	Develop specialized network slices dedicated to healthcare services, catering to applications such as remote patient monitoring, telemedicine, and healthcare IoT devices. This initiative focuses on ensuring stringent reliability and security requirements unique to the healthcare sector, fostering an ecosystem where data is transmitted efficiently and securely, ultimately improving the quality and accessibility of healthcare services.	Software

7.	Smart Automation	Chatbot to respond to text queries pertaining to various Acts, Rules, and Regulations applicable to Mining industries	A Chatbot is a computer program that uses Artificial Intelligence (AI) and Natural Language Processing (NLP) to understand customer questions and automate responses to them, imitating human conversation. As of now, various Acts, Rules and Regulations, DGMS Circulars, CoI Proceedings, etc. are applicable to Mining industries. These are some of the Acts and Rules: The Coal Mines Act, 1952 Indian Explosives Act, 1884 Colliery Control Order, 2000 Colliery Control Rules, 2004 The Coal Mines Regulations, 2017 The Payment of Wages (Mines) Rules, 1956 Additionally, land-related laws i.e. CBA, LA, RandR related queries can also be incorporated to develop Robust Management Information System. Hence it is proposed to make a chatbot available 24/7 for stakeholders and customers which can answer all their queries regarding the rules, acts, and circulars.	Software
8.	Blockchain & Cybersecurity	**Cybersecurity Fortification for Critical Infrastructure**: Implement cybersecurity solutions to protect critical infrastructure sectors such as energy, transportation, and healthcare, safeguarding against cyber threats that could have significant real-world consequences.	Develop robust cybersecurity solutions tailored for the protection of critical infrastructure sectors, including energy, transportation, and healthcare. The focus is on implementing measures to defend against cyber threats that pose potential real-world consequences, ensuring the resilience and integrity of essential services. The goal is to create advanced security frameworks that safeguard critical infrastructure from evolving cyber risks, thereby minimizing the potential impact on public safety and well-being.	Software
9.	Agriculture	App-Based Solution to identify and solve disease in plants/crops	Farmers lack a quick and accessible solution for identifying and resolving plant diseases, leading to significant crop losses. Create an app that allows farmers to upload photos of affected crops for expert analysis is needed to provide timely and effective solutions, ultimately enhancing agricultural productivity and securing food supplies.	Software

10.	Agriculture	Integration and Utilization of data-based being maintained by various Ministries/Departments for better utilization of raw materials and production capacity.	(i) Data of raw materials availability in India is maintained by various Ministries. (ii)Data of items imported by various countries are also available. (iii) Lot of Food grain Vegetables /Fruits are wasted in India. (iv) A software solution can be developed by utilizing all the data to advice the manufacturers/farmers to reduce the wastage and improve the exports/economy.	Software
11.	Transportation & Logistics	Dashboard for real-time monitoring of construction projects.	Designing of dashboards for Real-time monitoring of Construction projects using IOT devices and backend Artificial intelligence/ML tools to track Resources in the form of equipment/manpower, monitor their efficiency and safety in all situations	Software
12.	Transportation & Logistics	Dredging Analysis and Decision Support System.	Develop a Dredging Analysis and Decision Support System for Cochin Port to address the challenges posed by siltation, ensuring optimal utilization of resources. The system should provide real-time monitoring of draft levels in port channels and berths while integrating historical draft and meteorological data to predict future siltation, ultimately enabling proactive and cost-effective dredging strategies.	Software
13.	Renewable / Sustainable Energy	Student Innovation	Innovative ideas that help manage and generate renewable /sustainable sources more efficiently.	Software