PROJECT REPORT

H T Monitoring System

Our motto - A war against illegal mining in Rajasthan.

This Project is fully dedicated to complete the visions of Department of Mines and Geology Rajasthan.

Problem Statement-

Illegal mining in India including Rajasthan (**57% area of Rajasthan is under Regional Mineral Survey**) has become a menace not only to the people but also to the governments. Illegal mining robs the country of precious minerals and in return causes severe pollution and health hazards. The profit accrued is not or minimally shared with the government and the locals.

Abstract-

- It is defying to know the level of corruption in the mining sector. One of the pertinent problem lies in the loading and dislodging of the HT (Haul trucks) at the mining spot. There are several occasions and sightings when unauthorized vehicles enter the mining area and steal valuable ores of materials or other precious elements, selling the raw materials in the grey market at desire able price. To prevent such precarious activities in the mining sector "HT monitoring system" is designed. HT monitoring system is designed to check the Haul trucks at the entrance and exit of the mines. The system would be such designed so as to allow only the authorized vehicles to enter the arena, and only after verification it can exit from it.

- This project **is to introduce new technology for mineral conservation, zero tolerance against illegal mining this is one of future vision of Department of Mines and Geology of Rajasthan.**

- All the data of the HT's and the mined material would be uploaded to a government owned server as a written record **to achieve highest level of transparency in mining activities because it is first vision of Department of Mines and Geology Rajasthan.** Internet of things would play a major role in controlling the service of the application software. HT monitoring system will be useful in preventing corruption at the mining locations and would stop the drain of the country's money.

- One of the bigger achievement of this project is to move a step closer towards digital India, wherein encapsulating digitalization in the mining sector.

Solution of problem-

Main focus –Blockage of information (driver ID and details) between different associated functional members (driver and government employee) of mining sector and fully automated system at mining site. Entry and exit with no man interference

How we achieved it in our fully working project-

Some assumed real entities are:- Contractor, Driver, Higher level Employee of government, Lower level Employee of government

1. We have fully automated checking system at mining site entry only legal trucks are allowed to go inside with having special pass(it have no any id number but have secret id inside pass).
2. Truck weight measurement at entry time and exit time is automatically send threw message to lower level employee and he get only one secret id (which is actually driver id not known to driver because id is send threw pass provided him) so he cannot do any changes in coming data.
3. So, From above no any illegal activities can be done because different functional members cannot do interaction and system is automated (Automation detail described later).
4. Drivers have to do registration and get a pass only after confirmation with his contractor (under which he is going to work).
5. Only after confirmation with contractor pass has been send to driver provided address and providing of id is done by higher level employee because here they have to link up secret id pass with his details.
6. How much material is going out and threw which contractor is recorded at database and also its information is provided at website (detailed of website is described later) to maintain transparency.

IN SHORT- Driver do not know secret id of his pass and employee do not know driver detail associated with secret id come to him threw automated system so no illegal activities,and all the information of material in mines extracted will be shown on website with full detail.

Technical Description-

Hardware description –

- We used SIM 900 GSM Module, Arduino, Load cell, HX711 Module, RFID Transmitter and Receiver.
- SIM 900 GSM Module is used for sending information of weight of truck at entry and exit time to low level employee.
- Load cell and HX711 module is used to get weight of Truck.
- RFID Transmitter is used as pass here and RFID Transmitter is used to detect right pass.
- Audrino is used to do embedded programming which handles all process of hardware.

Software description-

- We made a web application with the help HTML, CSS, PHP, Botstrap, Mysql and we used MVC (Model View Controller) framework.
- This web application is used by all.
- Driver can register to work at mining site here.
- Particular section of this website is secured by password for government employees to do contractor registration, fill up information come from automated system at mining site and approval of driver after contacting his contractor.
- Transparency is maintained by providing all material extraction on this website with all the details.

Future possible improvement in this project(it must be in this project for real implementation)-

1. To increase security level we can use biometric system so that no one can steal any other pass and come at mining site.

2. Hide driver information also from high level employee by making a system to issue pass without having id outside the system. It can be made easily by linking database with embedded programming.

Using this project we can reduce 90% of illegal activities but if we want to get 99% of result we have to apply above both improvements.

Some Information about Rajasthan mining

IMPORTANT MINERAL DISCOVERIES IN RAJASTHAN-

The Mineral Resources of the State need to be explored and exploited on regular basis for usage of mineral for industrial and other usage, employment and revenue generation so the Department of Mines & Geology initiated systematic Mineral Survey and Prospecting activities in the year 1967. They are being continued and cover about 57% (2,00,000 sq.km.) area of Rajasthan under Regional Mineral Survey (RMS);22,000 sq.km. under Regional Geological Mapping (RGM); 4,500 sq.km. under Detailed Geological Mapping (DGM) and about 5,30,000 meterage of drilling. The planned efforts by the Department resulted in discovering a number of mineral deposits like:-

- Lead zinc deposit of Rampura-Agucha, Bhilwara district, with 58.8 million tonnes of reserves containing 1.9% Pb and 13.4% Zn. This is country's richest and largest single deposit of lead, zinc and silver and worked by open cast mining and now switched over to underground mining.
- Base metal deposit of Deri, Sirohi district, having 1 million tonnes resources containing 1.98% Cu, 5.4% Pb and 7.52% Zn.
- Base metal deposit of Basantgarh, Goliya, Sirohi district, with 3.5 million tonnes of resources containing 1.22-2.6% Cu and 3.6% Zn.
- Base metal deposit of Pipela, Sirohi district, with 1.2 million tonnes resources containing 1.2-2.2% Cu and 1.3-2.3 Zn.
- Copper deposit of Anjani, Udaipur district, with 1.0 million tonnes resources containing 1.19% Cu.
- Iron ore deposit of Chomu, Morija, Jaipur district, with 54.2 million tonnes resources containing 60%Fe.
- Iron ore deposit of Nathara-Ki-Pal, Udaipur district, with 14.2 million tonnes resources containing 50%Fe.
- Barytes deposit of Jagat-Relpatliya, Udaipur district, with 0.10 million tonnes resources.
- Fluorite deposit of Chowkri-Chapoli, Sikar district, with 70 million tonnes resources containing 15% CaF_2.
- Fluorite deposit of Kahila, Dungarpur district, with 0.3 million tonnes resources containing 15.20% CaF_2.
- Magnesite deposit of Sarupa-Gafa, Ajmer district, with 0.15 million tonnes resources.
- Rock phosphate deposits of Jhamarkotra, Udaipur district, with 74 million tonnes of resources having 16 to 38% P_2O_5.

- SMS grade Limestone deposits in Jaisalmer district, have been proved having resources of more than 1750 million tonnes.
- Cement grade limestone deposits in Jaisalmer, Nagaur, Pali, Banswara, Bundi, Bhilwara, Jhalawar, Udaipur, Chittaurgarh, Jhunjhunu, Sirohi, Pali, Kota, Ajmer districts etc. were having more than 10,000 million tonnesresources.
- Manganese deposit in Banswara district.
- Copper deposit in Dungarpur district.
- Minor mineral deposits like marble, granite, sandstone, quartz, feldspar, silicasand, siliceous earth, clays, soapstone etc. in various districts.

  Close, systematic and professional cooperation with Geological Survey of India and Mineral Exploration Corporation Ltd. resulted significantly in lignite exploration in Rajasthan. Lignite mineral resources of the order of 5720 million tones established at 78 localities in various districts of the state like Bikaner, Barmer, Nagaur, Jaisalmer and Jalore Details of depositin each district has been consolidated and compiled.

VISION FOR THE FUTURE OF MINING IN RAJASTHAN (BY DEPARTMENT OF MINES AND GEOLOGY)

The Department of Mines and Geology (DMG) has a mission & vision to continue to contribute in mineral development of the State and focused to:

- To achieve highest level of transparency in mineral concession and mining activities.
- e-auction of major mineral blocks and minor mineral plots.
- To introduce new technology for mineral conservation, zero tolerance against illegal mining.
- To work for the interest and benefit of person and areas affected by mining operations by creating new infrastructure.
- Customization of regulatory framework to make it user friendly and to suit local conditions for fulfillment of "Minimum Government, Maximum Governance" motto;
- Increase revenue of the State by promoting scientific and sustained mining;
- To make State economy stronger by increasing contribution of Mineral sector.
- Introduced e-portal to facilitate on - line filing of different applications, mining returns on line generation of rawanna together with weighment of mineral on real time basis and payment of royalty and other statutory payments.
- Increase "land under mining" from the current 0.54% to 1.5%;
- Increase the number of minerals under mining from 57 to 79 in short span of time;
- To make and grow mineral sector as reliable source of gainful employment especially in the rural and tribal areas where alternate/additional source of income is a necessity.
- Promote and motivate prospective stake holders for safe, systematic and efficient mining by adopting modern methods of mining which in turn shall also improve mineral conservation.
- Introduce modern technology in exploration to facilitate growth in the sector; and
- Ensure ecological balance through systematic scientific and eco- friendly mining
- Implementation of environment management tools and techniques for sustainable mining and extended social responsibility to protect the environment.

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