DETAILS

Build for Bharat Hackathon



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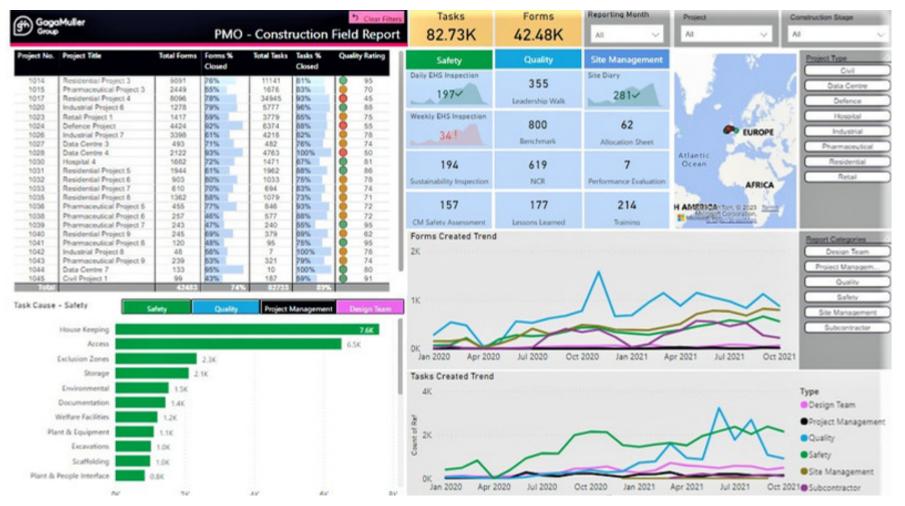
Institute Name: Jadavpur University

Theme Name: Logistics

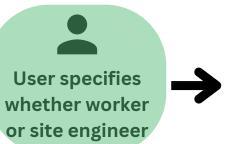
Idea Description

Prototype:

- 1. Data Collection: The IoT ChatBot acts as an interface for e-commerce management services(under the realm of infrastructure management), allowing both workers and site engineers to input critical information about safety and efficiency practices at construction sites. This information encompasses many factors, such as incident reports, equipment status, and workflow observations.
- 2. Data Recording: Once the data is provided through the ChatBot, it is meticulously recorded in a centralized database, via cloud-based network servers hosted in the ecommerce platform..
- 3. Machine Learning Integration: The collected data forms the basis for insights and improvements. Machine learning algorithms are employed to process and optimize this data.
- 4. **Dashboard Creation:** On a weekly basis, the processed data is harnessed to generate dynamic dashboards. These dashboards offer a comprehensive visual representation of the construction site's safety and efficiency metrics for instantaneous evaluation.



Flowchart:



ChatBot to ask questions in Hindi and English, via an e-commerce management services platform interface

Workers will be responsible to give attendance daily and record whether they felt safe in the working environment

Site engineers will be required to give attendance daily and record progress weekly to calculate efficiency upon some pre-defined metrics/parameters

Categorical features(columns) such as ['Project Title'],['Time taken'], ['Safety Rating'],['Quality

Rating'] given on the dataset

The data from the database is retrieved and organized into a dataset(Excel-sheet)



Feedback received per user is recorded in a database



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Filtering and cleaning of data performed through ML libraries and dependencies



After cleaning, the columns of ['Time taken'],['Safety Rating'], ['Quality Rating'] are selected as categorical features(train and test data)

ML models like LinearRegression, KNN, SVR, and RandomForest are applied to the training data to find the accuracy of how the efficiency and the safety are measured based on the mean and the weighted average of the training data

Finally, filtered and categorized data based on Construction work and Safety parameters is extracted onto an SQL database for the creation of a detailed visual dashboard of the Construction **Project Report**



Data is presented visually in the form of histograms and pie-charts, also the performance of different ML models



Technology stacks used:





















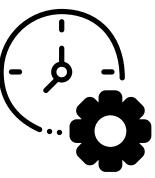
Deployment in Industrial Context

Revolutionizing Construction Project Management through E-commerce retail platform and SaaS model

- **1.Supervising Large-Scale Industrial Projects**: Overseeing and coordinating the execution of extensive industrial projects, ensuring seamless operations and successful completion.
- 2. Monitoring Progress of Highway and Railway Projects: Vigilantly tracking the development and milestones of highway and railway construction initiatives, ensuring they adhere to established timelines and quality standards.
- 3. Maintenance Monitoring: Consistently observing and documenting maintenance activities to guarantee equipment and infrastructure remain in optimal working condition, minimizing disruptions and operational downtime.
- 4. Adherence to ESH Guidelines: Strictly adhering to Environmental, Safety and Health (ESH) guidelines to guarantee the safety of workers, protection of the environment, and compliance with regulatory requirements.
- 5. Resource Optimization: Effectively managing and allocating resources, including manpower, materials, and equipment, to maximize efficiency and minimize waste in project execution.
- 6.Maintaining a High Standard of Work Environment: Creating and sustaining a safe, organized, and productive work environment for all team members, fostering a positive and conducive atmosphere for project success.



1. Real-time Construction safety oversight: Implementing a system that allows for constant vigilance and immediate action regarding safety measures on the construction site. This involves monitoring the adherence to safety protocols, identifying potential hazards, and ensuring the well-being of all workers in real-time.



2.Operational Efficiency Evaluation: Continuously assessing the effectiveness and efficiency of various construction processes and workflows as the project unfolds. This involves identifying areas where improvements can be made to optimize resource utilization and reduce unnecessary delays.



3.Resource Tracking and Management: Keeping a close eye on the allocation and utilization of resources such as materials, equipment, and labor throughout the construction project. This ensures that resources are used judiciously, minimizing waste and preventing shortages.



4.Ongoing Quality Assessment: Regularly evaluating the quality of workmanship and the adherence to established quality standards during all stages of construction. This includes identifying any deviations from quality requirements and taking corrective measures to maintain the desired level of excellence.