

The background of the entire page is a dark, high-contrast photograph of a large pile of coal. The surface of the coal is covered in numerous circular and linear tire tracks, indicating heavy machinery activity. On the left side, a portion of a yellow industrial weighing scale is visible, extending from the top left towards the center. The scale's structure is complex, with various mechanical components and a large weighing platform. The overall scene is industrial and gritty.

# **UNMANNED WEIGHBRIDGE SYSTEM**





## Context

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The efficiency in transport of mineral ore from pit to port is a critical determinant of commercial impact and growth of the mining sector. Key parameters influencing efficiencies of mining value chain include **production throughput, speed of mineral evacuation and minimization of pilferages in the supply chain.**

Policy interventions by Central and State Governments have regulated mineral movement regime through the use of electronically generated trip sheets / transit passes. With the adoption of mechanization by the industry, production throughput has increased manifold over the years.

ICT based innovations such as mineral management systems have proved useful in introducing transparency and accountability in value chain. However, factoring the congestion in mining areas, there is a significant scope to improve upon the speed of mineral evacuation.

It is now time for the mining industry to step into the **era of digital transformation** and achieve greater degree of seamless user experience.

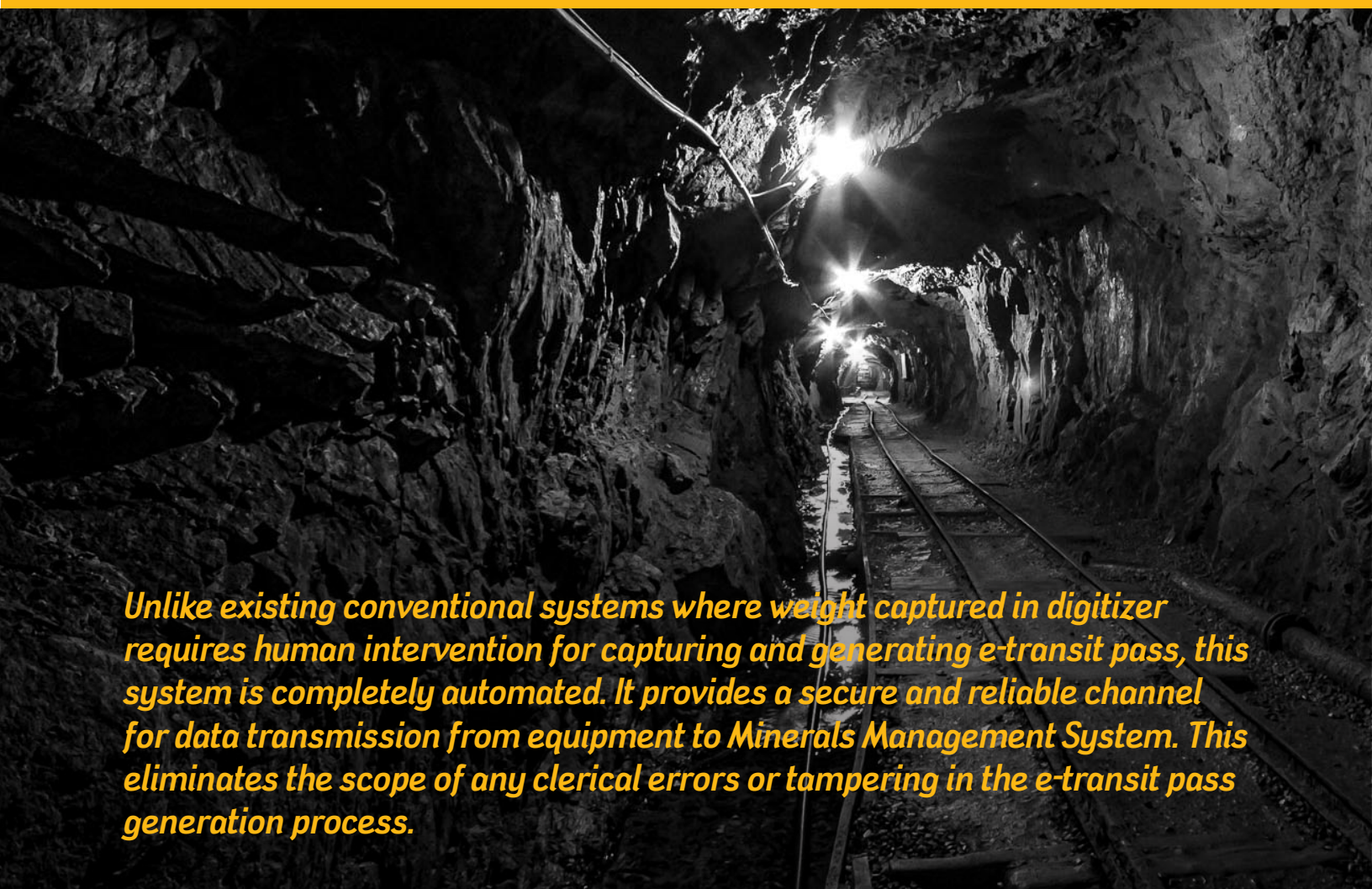
***Our Unmanned Weighbridge System is a plug-and-play system that automates the loading, weighment and dynamic route planning of mineral carrying vehicles. This is a controller based system which reduces the need to have dedicated manpower for carrying out weighbridge and other related operations.***



# Features

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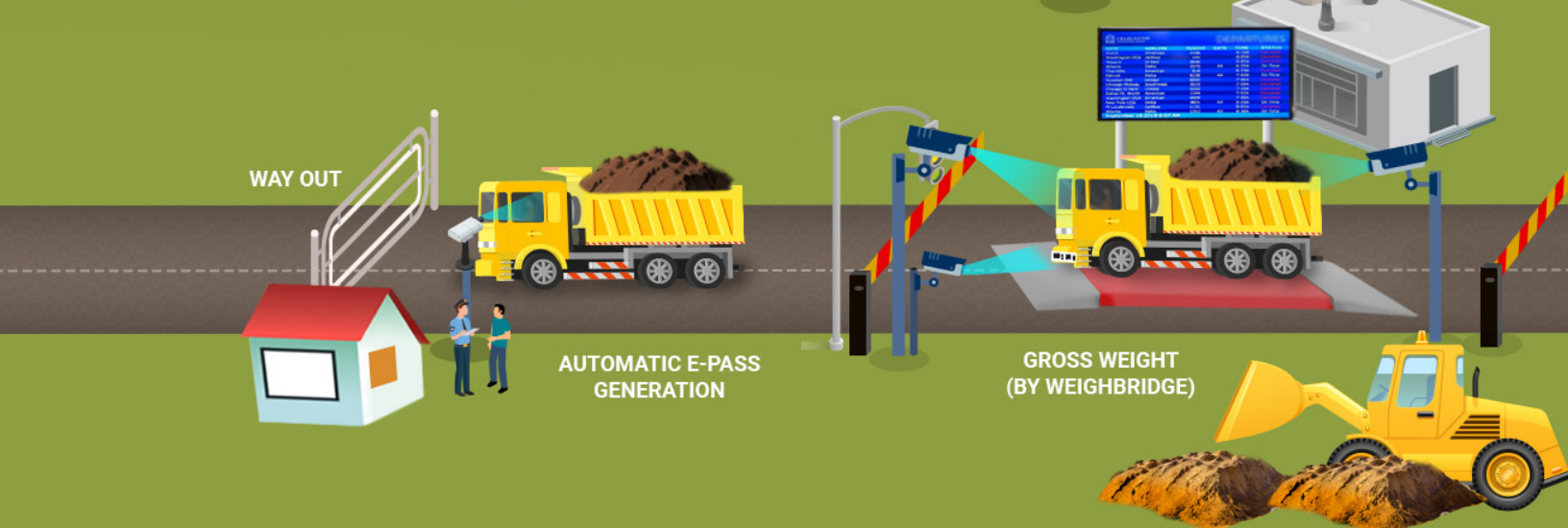
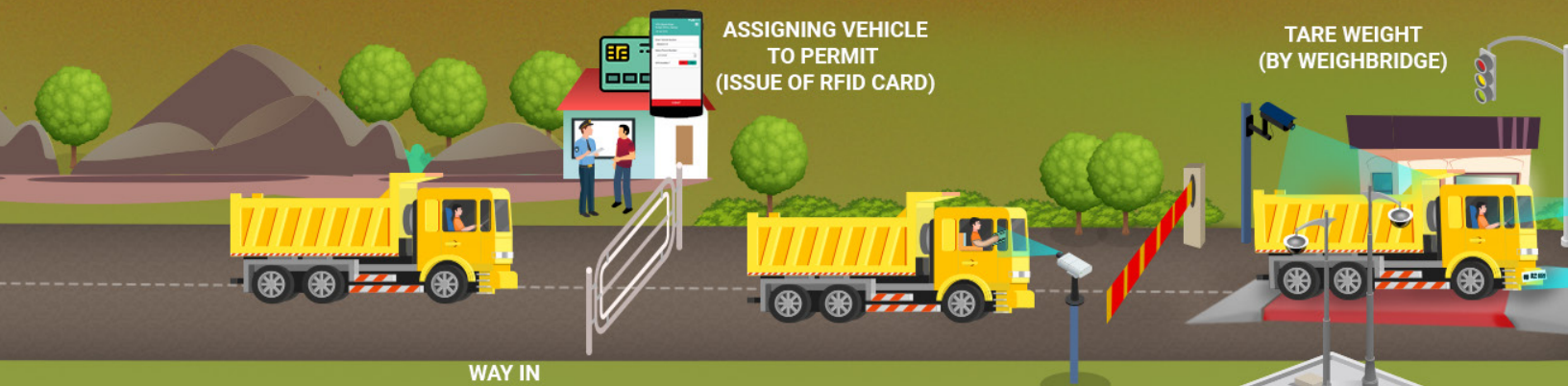
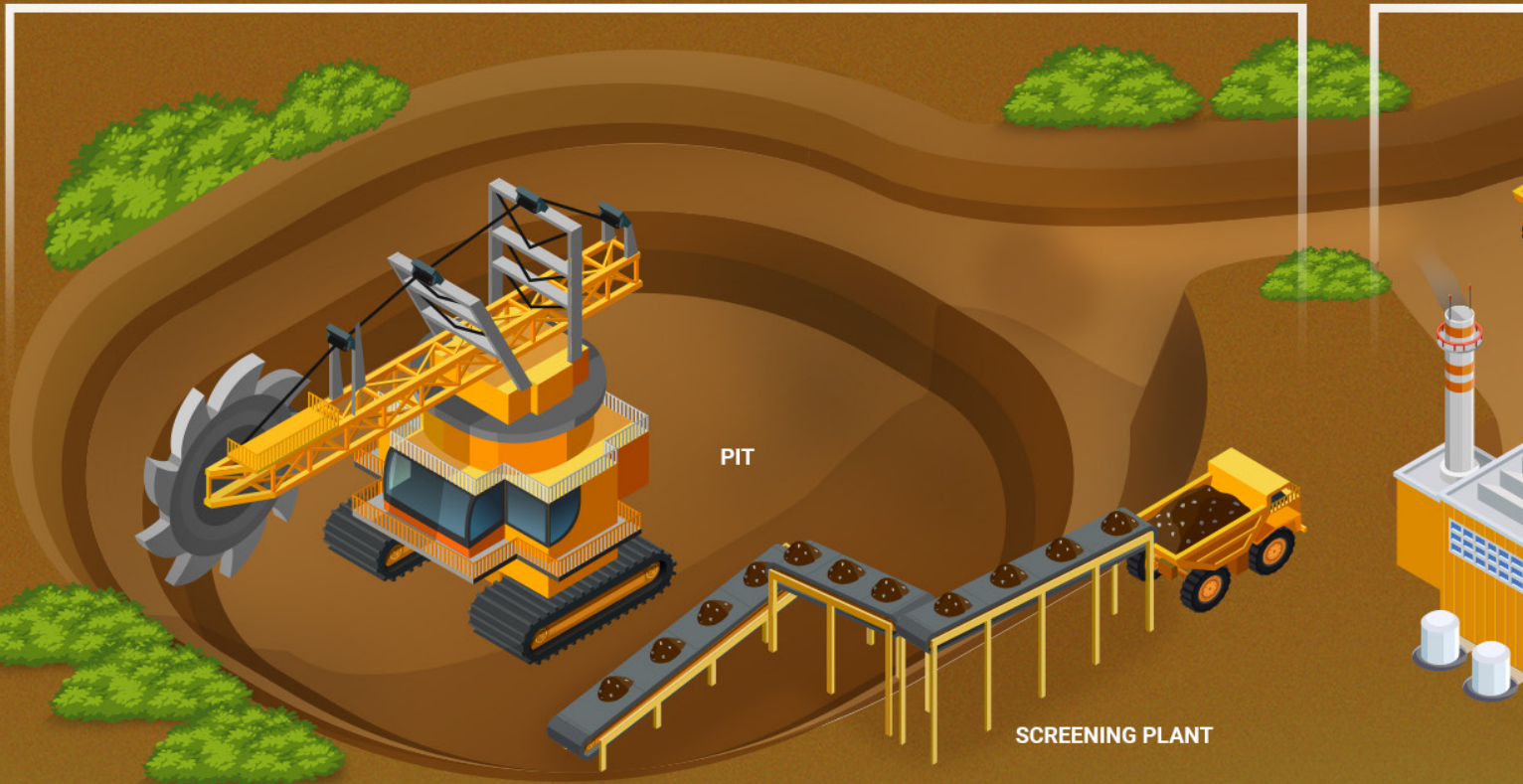
- Parking lot management and vehicle movement in and out of mining stockyard helps in avoiding congestion facilitating smooth movement
- Assigning vehicle to permit generated from Mineral Management System
- Collecting, processing & storing data of the vehicle, tare weight (without mineral) and gross weight (with mineral)
- Dynamic route planning and task allocation based on availability Of weighbridge
- Integration with vehicle guidance and positioning sensors on weighbridge along with active feedback Public Announcement (PA) system
- Visual information of weighment process on large LED screens
- Integration with GIS and GPS for tracking of vehicles within mining area (optional feature)



***Unlike existing conventional systems where weight captured in digitizer requires human intervention for capturing and generating e-transit pass, this system is completely automated. It provides a secure and reliable channel for data transmission from equipment to Minerals Management System. This eliminates the scope of any clerical errors or tampering in the e-transit pass generation process.***



# PRODUCTION





# STOCKYARD

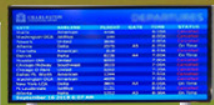


CRUSHER



SALEABLE STACK

DISPLAY UNIT



SALEABLE STOCKPILE



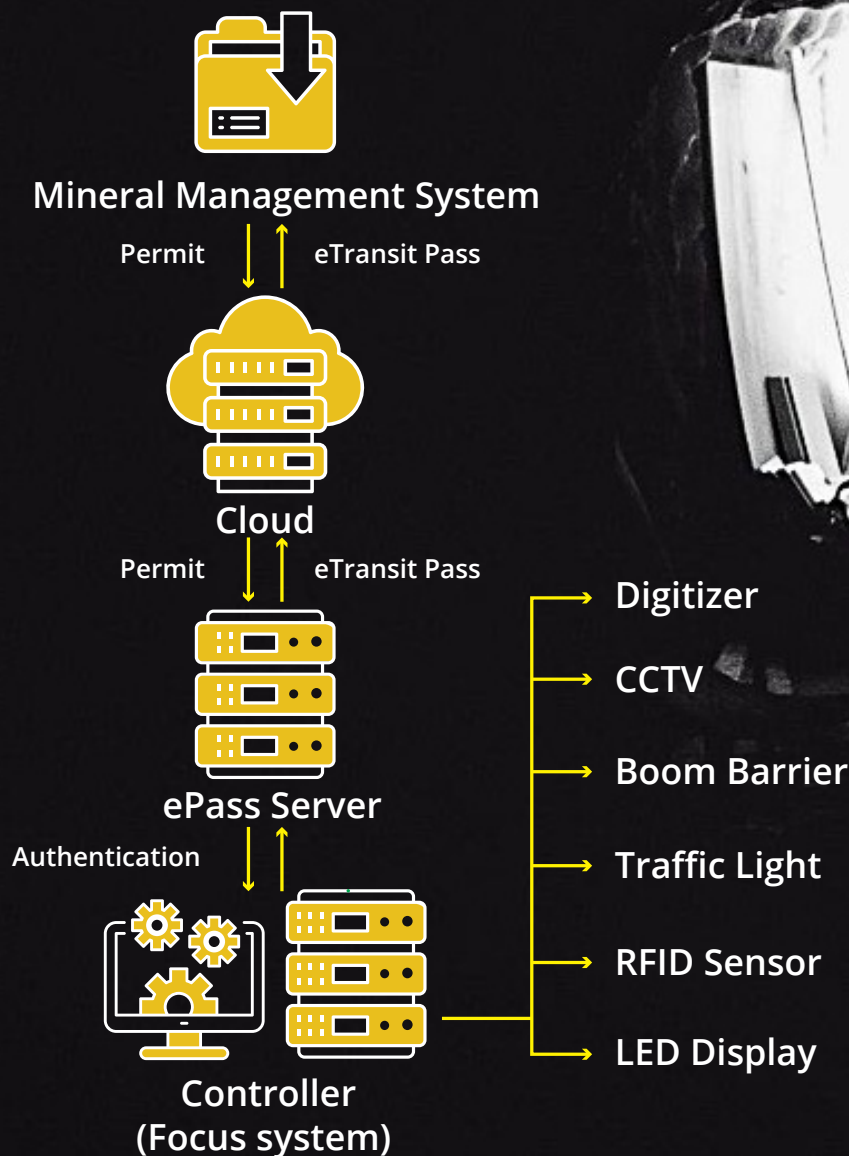
LOADING AREA  
(STOCKYARD)





# Integration with other systems

- RFID Readers, boom barriers, traffic lights and CCTV Cameras for improved facility control, enhanced security & effective management of inbound and outbound traffic
- Weighbridge digitizers for real-time weight capture
- Internal ERP for billing & inventory control
- Mineral Management System for e-transit pass generation



# Benefits

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- Faster throughput for optimal weighbridge utilization
- Better management of sales activity
- Automatic identification of mineral carrying vehicles
- Easy integration with ERP, Mines & Minerals Management System and ancillary units
- Easy scalability of application (without requiring extensive re-configuration or development)
- Reduction in operating costs through complete automated weighing operations
- Single view of all material inbound and outbound from stockyard

*A state of the art dashboard acts as a decision support system for mine owners enabling dynamic management of mineral movement and traffic flow across the value chain. Periodic reporting on production / sales figures enable the management to take strategic decision on resource allocation to reach production benchmarks.*

# Checks & Balances enabled by this system

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- Entry of only authorized vehicles for lifting mineral ore & weighment
- Completion of unloading of previous load at stockyard before taking the next fresh load from production area
- Flagging of halt of vehicles beyond acceptable time-frame
- Controlling any deviations from planned route of mineral carrying vehicle





## **CSM Technologies**

is a pioneering GovTech organization that harnesses the power of existing and emerging technologies to provide solutions with tangible impact on efficiency of governance and quality of citizens' lives.

Within the specific domain of mining, CSM Technologies has enabled automation of mines & minerals management for states such as Odisha, Jharkhand & Bihar. It is now investing in use cases of emerging tech such as robotics, drones, analytics & cyber security to transform mining value chains.

## **CSM Technologies**

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