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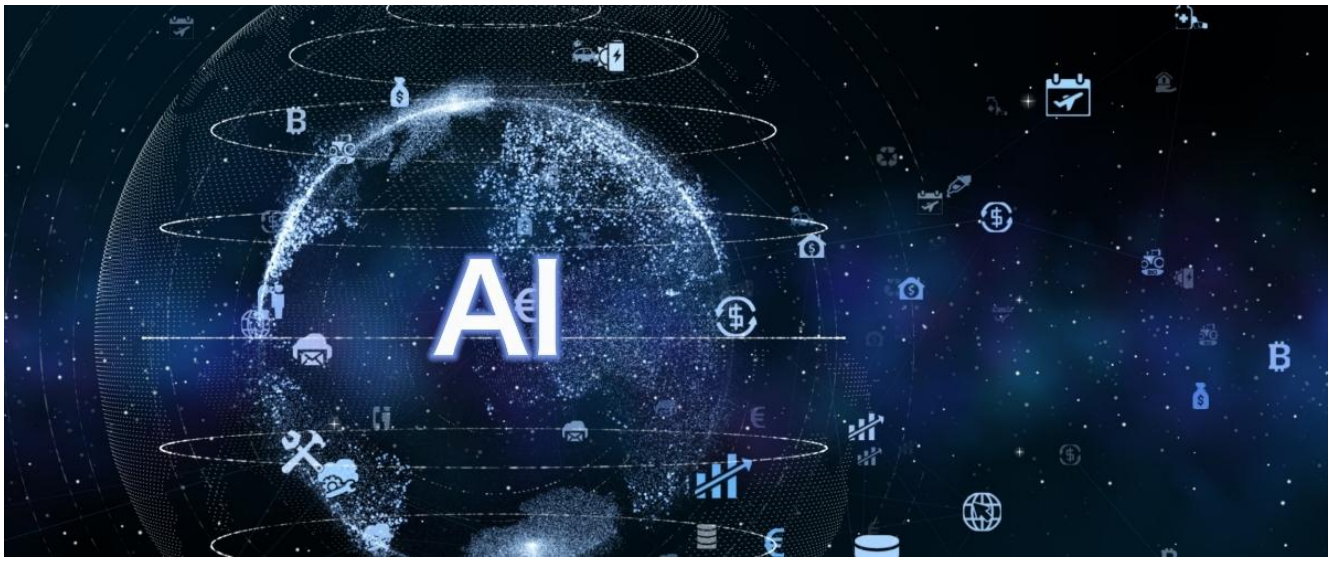
The Future of Governance, Agriculture, and Industry Through Emerging Technologies at CSM Tech

8th Jul,2025

At CSM Tech, we don’t just build technology. We engineer transformative solutions that change the way industries and governments operate. With a dynamic portfolio that spans sectors like agriculture, governance, mining, and industrial operations, CSM Tech is committed to delivering innovative solutions through **Artificial Intelligence (AI)**, **Machine Learning (ML), Geographic Information Systems (GIS), Internet of Things (IoT), and Data Analytics**. These technologies are at the core of what we do, driving operational efficiency, transparency, and sustainability.

Let's explore the breadth and depth of CSM Tech's expertise in emerging technologies and highlight the wide-ranging projects that demonstrate how we are redefining the digital landscape.

AI and ML: Leading the Charge in Smarter Governance and Industry



CSM Tech’s use of Artificial Intelligence and Machine Learning is transforming not just how operations are run, but how organizations make decisions. Below are some key projects that showcase the power of AI and ML in governance, agriculture, and industry.

1. Crop Analytics for Agricultural Transparency:

The **Crop One solution** for **Odisha’s Food Supplies and Consumer Welfare (FSCW) Department** is a prime example of AI and ML at work. Combining satellite imagery, GIS mapping, and machine learning, Crop One enables precise yield tracking and procurement pattern predictions. The system has already mapped **1.31 crore acres**, registering over 18 lakh farmers and detecting **9,237 suspect plots**. This transparency has saved the government **?4,067 crores**, ensuring a fair disbursement of **?37,000 crores** in Minimum Support Price (MSP) to eligible farmers.

2. AI in Grievance Redressal:

For the **Urban Development Department of Odisha**, CSM Tech has implemented an **AI-driven Grievance Detection Model** that automatically identifies, categorizes, and prioritizes complaints. By leveraging historical data and predictive analytics, this solution reduces response times and enhances citizen satisfaction, ensuring that grievances are addressed proactively.

3. e-Pravesh for Seamless Visitor Management:

The **e-Pravesh system** developed for the **Government of Odisha** is a fast, secure visitor management solution. Using facial recognition, the system verifies visitors in **just 2-3 seconds**, automating the entry process and reducing administrative workload, while enhancing transparency and security.

4. RPA-Driven eDespatch System:

CSM Tech's **eDespatch system** uses Robotic Process Automation (RPA) and Optical Character Recognition (OCR) to streamline government document management. This automation eliminates manual data entry, reduces errors, and ensures faster dispatch, making communication workflows more efficient and transparent.

5. Social Media Sentiment Analysis with Ama Sasana:

CSM's **social media sentiment analysis system** for the Odisha government integrates Natural Language Processing (NLP), OCR, and machine learning models to conduct real-time sentiment analysis on public feedback from social media. By detecting languages, extracting text from images, and classifying sentiment, the system helps track public opinion trends, enhance transparency, and strengthen citizen engagement through measurable feedback.

6. Generative AI Chatbots for Public Sector:

CSM Tech has implemented **AI-powered FAQ chatbots** for entities such as **ORERA, JIMMS, and FCI** to streamline public query resolution. These chatbots use advanced NLP, vector databases, and Retrieval-Augmented Generation (RAG) to provide accurate and instant responses, automating responses to high-volume queries, and ensuring 24/7 availability to enhance service efficiency.

7. Guardian Gender Identification Using AI in SPDP:

For the **Social Protection Digital Platform (SPDP) in Odisha**, CSM Tech has developed a name-based gender classification model using NLP and machine learning. This solution resolves ambiguities in identifying guardians, improving demographic data quality. Additionally, the AI-based transliteration system unifies village names across Odia and English datasets, enhancing data accuracy and multilingual governance.

8. AI-Based Stack Monitoring for Mineral Logistics:

CSM Tech's **AI-Based Stack Monitoring System** for the **i3MS (Integrated Mines and Minerals Management System)** in Odisha automates vehicle regulation and tracking in mineral stack areas. Using geo-fenced Regions of Interest (ROI) and AI-powered cameras, the system tracks truck and loader movements, ensuring compliance, improving operational

efficiency, and supporting cloud or edge deployment for secure operations.

IoT: Revolutionizing Industry and Operations

CSM Tech's IoT solutions have been designed to optimize operations in sectors such as mining, logistics, and manufacturing. By providing real-time insights and automated workflows, these systems are driving efficiency and accountability.

1. AI-Enhanced Weighbridge Automation:

The **Weighbridge Automation System** powered by AI, IoT, and Automatic Number Plate Recognition (ANPR) has transformed mineral dispatch operations for **JSW, OMC, NLC India, and GMDC**. By automating weighing and dispatch processes, this system has reduced dispatch turnaround times by 12%, decreased manpower **costs by 85%**, and provided real-time operational insights.

2. AR Sampling for Mineral Sampling:

CSM Tech's patented **AR Sampling solution** is the first of its kind in the world. This system, used by **16 miners and lessees**, integrates augmented reality to enhance mineral sampling efficiency, improving transparency and streamlining workflows. With over **17,000 samples** taken and **120 MMT of ore processed**, this system is setting new standards in the industry.

Data Analytics: Empowering Data-Driven Decisions

With powerful data analytics tools like **Tableau and SAS**, CSM Tech enables governments and businesses to make informed, data-driven decisions. By transforming complex data into actionable insights, we help organizations forecast trends, optimize resources, and improve outcomes.

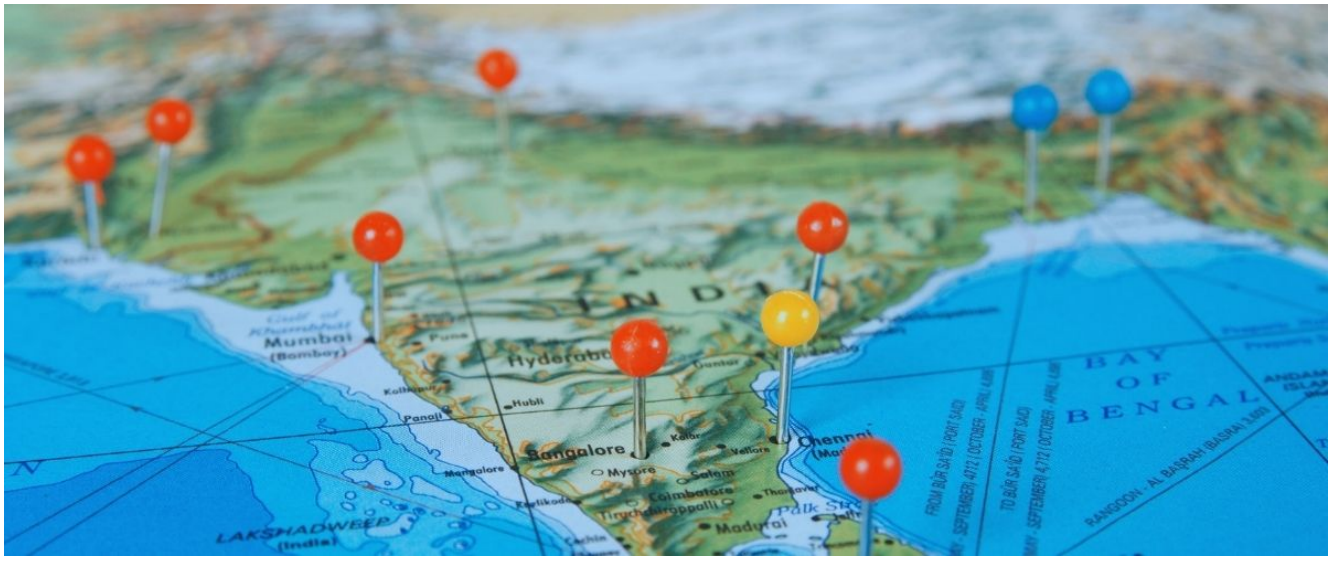
1. COVID-19 Dashboard for Government Response:

During the pandemic, CSM Tech's **COVID-19 Dashboard** for the Government of Odisha used SAS-powered data analytics to track infection trends, recovery rates, and healthcare infrastructure needs. This real-time tool helped the government make timely decisions regarding lockdowns and resource allocation, playing a crucial role in managing the crisis.

2. Mining Revenue Forecasting with Predictive Analytics:

CSM Tech's **Mining Revenue Forecasting solution** for **Odisha's Integrated Mines & Minerals Management System (i3MS)** uses SAS-based predictive analytics to accurately project mining revenues. By combining real-time data with machine learning, the system provides dynamic forecasting and supports smarter financial planning and resource management.

GIS: Transforming Land Management and Planning



Geographic Information Systems (GIS) have become an essential tool for land management, urban planning, and resource allocation. CSM Tech's GIS-based solutions are driving smarter decisions and enabling efficient planning in various sectors.

1. GIS School Mapping for Ethiopia:

CSM Tech implemented a **School Mapping solution** for **Ethiopia's Ministry of Education and the World Bank**, covering **40,000 schools across 10 regions**. The platform uses GIS to map infrastructure, identify underserved areas, and guide the construction of new schools, improving resource allocation and reducing dropout rates.

2. Shree Jagannath Temple Land Management System:

In Odisha, CSM Tech developed an **integrated Land Management Information System** for the **Shree Jagannath Temple Administration**. This system digitizes and maps over **3,000 villages**, enabling better tracking of temple land, preventing encroachment, and streamlining transactions with citizen self-registration and digital verification.

3. eLMS for Industrial Township Management:

CSM Tech's **eLMS** for the **DMIC - Maharashtra Industrial Township (AURIC) and DMIC - Greater Noida** is revolutionizing industrial land management. By enabling real-time visualization and automated workflows, this GIS-based system helps optimize land allocation, improves land utilization rates, and fosters industrial growth.

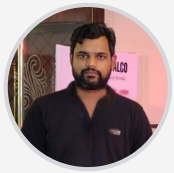
The Future: Leading the Way in Innovation

As technology evolves, CSM Tech continues to lead in the application of emerging technologies. We are constantly pushing the boundaries of AI, IoT, GIS, and data analytics, exploring new ways to improve governance, industry, and agriculture. Our commitment to innovation ensures that we are not only addressing current challenges but also anticipating future needs.

Looking ahead, CSM Tech plans to **enhance its use of AI and ML for predictive analytics**, leveraging more advanced algorithms to support smarter decision-making. Additionally, with the integration of more IoT devices and sensors, we will continue to provide real-time data that optimizes operations and boosts efficiency.

Conclusion: A Technological Vanguard Driving Change

From AI-driven governance solutions to IoT-powered industrial optimizations, CSM Tech is leading the way in digital transformation. With a focus on innovation, efficiency, and transparency, we continue to provide smart solutions that tackle some of the world’s most pressing challenges. As we move into the future, CSM Tech will remain at the forefront of emerging technologies, empowering organizations to operate more efficiently, make better decisions, and foster growth across industries.



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