

Vyomchara

Revolutionizing Mining with Integrated Technology

Harsh & Somu

IITB BharatGEN

2026 年 1 月 20 日

- ① The Problem: An Industry Ripe for Disruption
- ② Our Solution: The Vyomchara Mining 4.0 Platform
- ③ The Technology
 - The Hardware: "Voxel" - Precision Mineral Analysis
 - The Software: AI-Powered Insights & Dashboard
- ④ Business Model & Go-to-Market Strategy
- ⑤ Competitive Landscape
- ⑥ The Team
- ⑦ Conclusion

① The Problem: An Industry Ripe for Disruption

② Our Solution: The Vyomchara Mining 4.0 Platform

③ The Technology

④ Business Model & Go-to-Market Strategy

⑤ Competitive Landscape

⑥ The Team

⑦ Conclusion

The Indian Mining Sector: A Foundation of the Economy Facing Foundational Cracks

- **Technological Stagnation:** High resistance to new tech due to entrenched practices and workforce concerns.

[Placeholder: A diagram showing the fragmented and inefficient mining value chain]

The Indian Mining Sector: A Foundation of the Economy Facing Foundational Cracks

- **Technological Stagnation:** High resistance to new tech due to entrenched practices and workforce concerns.
- **Fragmented Solutions:** Lack of a single, end-to-end platform for the entire mining lifecycle (Auction -> Exploration -> Production -> Delivery).

[Placeholder: A diagram showing the fragmented and inefficient mining value chain]

The Indian Mining Sector: A Foundation of the Economy Facing Foundational Cracks

- **Technological Stagnation:** High resistance to new tech due to entrenched practices and workforce concerns.
- **Fragmented Solutions:** Lack of a single, end-to-end platform for the entire mining lifecycle (Auction -> Exploration -> Production -> Delivery).
- **Operational Inefficiency:** Challenges in key areas like ventilation, geological surveying, and resource management.

[Placeholder: A diagram showing the fragmented and inefficient mining value chain]

The Indian Mining Sector: A Foundation of the Economy Facing Foundational Cracks

- **Technological Stagnation:** High resistance to new tech due to entrenched practices and workforce concerns.
- **Fragmented Solutions:** Lack of a single, end-to-end platform for the entire mining lifecycle (Auction -> Exploration -> Production -> Delivery).
- **Operational Inefficiency:** Challenges in key areas like ventilation, geological surveying, and resource management.
- **High Costs & Remote Infra:** Expensive equipment and limited infrastructure in key mining regions.

[Placeholder: A diagram showing the fragmented and inefficient mining value chain]

1 The Problem: An Industry Ripe for Disruption

2 Our Solution: The Vyomchara Mining 4.0 Platform

3 The Technology

4 Business Model & Go-to-Market Strategy

5 Competitive Landscape

6 The Team

7 Conclusion

Integrating the Physical and Digital to Build the Mine of the Future

- **Core Concept:** A unified platform combining proprietary hardware and intelligent software to optimize the entire mining process.
- **Three Pillars:**
 - ① **Acquire:** Gather high-quality data using advanced sensors.
 - ② **Analyze:** Use AI/ML to derive actionable insights from data.
 - ③ **Act:** Provide tools for automation, management, and reporting.

[Placeholder: A high-level diagram showing Acquire -> Analyze -> Act loop with Vyomchara at the center]

① The Problem: An Industry Ripe for Disruption

② Our Solution: The Vyomchara Mining 4.0 Platform

③ The Technology

The Hardware: "Voxel" - Precision Mineral Analysis

The Software: AI-Powered Insights & Dashboard

④ Business Model & Go-to-Market Strategy

⑤ Competitive Landscape

⑥ The Team

⑦ Conclusion

① The Problem: An Industry Ripe for Disruption

② Our Solution: The Vyomchara Mining 4.0 Platform

③ The Technology

The Hardware: "Voxel" - Precision Mineral Analysis

The Software: AI-Powered Insights & Dashboard

④ Business Model & Go-to-Market Strategy

⑤ Competitive Landscape

⑥ The Team

⑦ Conclusion

Voxel: Lab-Grade Hyperspectral Analysis, Anywhere.

- **Description:** A portable, drone-mountable sensor for real-time, non-destructive mineral analysis.
- **Key Features:**
 - **Functionality:** Iron ore grade detection, mineral mapping.
 - **Technology:** CNC body, advanced outsourced camera, ESP32 for control.
 - **Advantage:** A cost-effective and portable alternative to massive, stationary systems (like Boxscan).

[Placeholder: A 3D render or concept design of the "Voxel" device, possibly mounted on a drone]

① The Problem: An Industry Ripe for Disruption

② Our Solution: The Vyomchara Mining 4.0 Platform

③ The Technology

The Hardware: "Voxel" - Precision Mineral Analysis

The Software: AI-Powered Insights & Dashboard

④ Business Model & Go-to-Market Strategy

⑤ Competitive Landscape

⑥ The Team

⑦ Conclusion

Turning Raw Data into Actionable Intelligence

- **AI Models:**

- **SAM (Spectral Angle Mapper):** Identifies specific minerals.
- **CNN (Convolutional Neural Network):** Identifies mineral block size and location.
- **Fusion Model:** Combines SAM+CNN for precise deposit mapping.

- **Mining 4.0 Dashboard:**

- **Features:** Fleet & Fuel Management, Asset Maintenance, Production Scheduling, Compliance Reporting (DGMS).
- **Benefit:** Centralized control, operational visibility, and data-driven decision making.

[Placeholder: A mockup of the "Mining 4.0 Dashboard" UI, showing key metrics and modules]

- 1 The Problem: An Industry Ripe for Disruption
- 2 Our Solution: The Vyomchara Mining 4.0 Platform
- 3 The Technology
- 4 Business Model & Go-to-Market Strategy
- 5 Competitive Landscape
- 6 The Team
- 7 Conclusion

Flexible Models for a Diverse Market

- **Dual Approach:**

- **B2B Consultancy:** Partner with private firms (e.g., Vedanta, Adani) to provide bespoke optimization solutions.
- **B2G Tenders:** Bid for government contracts to implement our platform at a larger scale (e.g., with Coal India, OMC).

- **Go-to-Market:**

- **Multi-Stakeholder Engagement:** Proactively work with all parties to ease tech adoption.
- **Partnership Ecosystem:** Collaborate to reduce costs and offer a complete solution.
- **Focus on ROI:** Use clear metrics to prove the value and justify investment.

[Placeholder: A diagram showing the B2B and B2G funnels]

- 1 The Problem: An Industry Ripe for Disruption
- 2 Our Solution: The Vyomchara Mining 4.0 Platform
- 3 The Technology
- 4 Business Model & Go-to-Market Strategy
- 5 Competitive Landscape
- 6 The Team
- 7 Conclusion

What Sets Us Apart

- **Existing Solutions:** Mostly fragmented, non-integrated, or extremely expensive (e.g., Geotek's Boxscan).
- **Our Advantage:** We are a system integrator. Our core IP is the seamless combination of portable hardware, advanced AI, and a unified software platform. We are more affordable and flexible.

[Placeholder: A table comparing Vyomchara to competitors on factors like cost, portability, integration, and AI capabilities]

- 1 The Problem: An Industry Ripe for Disruption
- 2 Our Solution: The Vyomchara Mining 4.0 Platform
- 3 The Technology
- 4 Business Model & Go-to-Market Strategy
- 5 Competitive Landscape
- 6 The Team
- 7 Conclusion

The Team

- **Team:** Harsh & Somu
- **Advisors:** Profs, advisors at ministry levels
- **Expertise:** Engineering, AI/ML, Business Strategy

- 1 The Problem: An Industry Ripe for Disruption
- 2 Our Solution: The Vyomchara Mining 4.0 Platform
- 3 The Technology
- 4 Business Model & Go-to-Market Strategy
- 5 Competitive Landscape
- 6 The Team
- 7 Conclusion

Call to Action

- **Ask:** Looking for strategic partnerships and pilot project opportunities.
- **Contact:** somupra9@gmail.com

Thanks!