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Discussion-Opinion-Editorial



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Most SAMOG and MOGI Companies are either Clueless or Failing to Leverage the Startup Synergies. There are Many Good Examples, though.... Do Not be Obsessed with the Fear of Failure and Experience. Take a risk and keep reducing it

SAMOG: Stand Alone Minerals Oil & Gas

MOGI: Minerals Oil & Gas Integrated

Abstract

SAMOG and MOGI companies are slow to adopt a startup culture. Within the archetypal systems, that most of these companies are bound to, it is difficult to adopt a new and challenging culture of aligning with startups and the cultural change they demand from the companies and the demand they present to the companies. But things are changing. Major SAMOG and MOGI companies, particularly in North America, Asia-Pacific, and South America are taking the lead in adopting startups and ecosystems to leverage their reach and control. Companies have begun to understand that many of the past mining practices are no longer socially, environmentally, or economically viable in today's world. That previously amorphous concept called 'social license to operate for example is very much alive and well, and empowering people in communities affected by mining to take a lot more interest in what's going on in their back yard. Then there is the very real shortage of qualified mining professionals, which is, in part, a legacy of the industry's history of boom and bust hiring and firing habits. Combine these and you have a situation ripe for start-ups who want to develop technologies that can assist the industry in addressing these and other issues.

Keywords: *Funding, Startup, Strategy, Technology Acquisition, Venture Capital*

1.0 Introduction

A startup is loosely defined as a new company or business. However, many new companies wouldn't necessarily consider themselves start-ups so it begs the question. What makes a start-up intrinsically different from other newly established businesses? One answer comes from Natalie Robehmed via a 2013 Forbes article. She mentioned

that a start-up is typically distinguished by its 'ability to grow' rapidly and by the way it's 'designed to scale very quickly. For established companies, a startup can provide new technology, new markets, and new customers with opportunities of growth. Increased collaboration between established corporates and startups has created win-win situations. Many large Indian conglomerates have set up startup accelerators or venture funds. For instance, Reliance Industries' JioGenNext has supported over 170 startups. The acquisition of online pharmacy 1mg by Tata Digital in 2021, illustrates the potential of such collaborations.

Globally, startups are coming up with excellent solutions for finding grants, benefits, exploration funding, and other necessary access to opportunities. They're even helping management handle company image and shape reputation through platforms that can enhance customer and stakeholder sentiment.

SAMOG and MOGI companies are slow to adopt a startup culture. Within the archetypal systems, that most of these companies are bound to, it is difficult to adopt a new and challenging culture of aligning with startups and the cultural change they demand from the companies and the demand they present to the companies.

2.0 Recent Funding Rounds in Mining Tech

In the year 2024, till November 2024, Mining Tech companies have raised $745M in equity funding across 19 rounds. In the same period last year (i.e., till November 2023), Mining Tech companies had raised $642M across 29 rounds. So, 2024 has seen a 16.09% rise in funding in Mining Tech companies as compared to 2023 (Table 1).

3.0 Some Countries Progressed Ahead of Others

At the start of 2018, there were some 200 start-ups globally working on mining-related projects. Many of them are located in the mining powerhouse economies of the world

Table 1. Recent important funding rounds in mining tech

Company	Round Raised	Amount Raised	Funding Date	Investors
Summit Nanotech	Series A	$5M	Nov 12, 2024	-
Teleo	Series A	$7M	Oct 18, 2024	UP Partners and 3 more
KoBold Metals	Series D	$491M	Sep 20, 2024	-
Muon Vision	Seed	$2M	Aug 05, 2024	-
ILiAd Technologies	Seed	Undisclosed	Jul 31, 2024	Schlumberger
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with Australia and the US not surprisingly topping the list for sheer numbers of start-ups. However, when it comes to the most popular cities for start-ups there are a few surprises. Santiago in Chile for example has more start-ups involved in mining than any city. The other surprise is that the city most often associated with Australia's mining industry is not where most of the start-ups are located. That honour goes to Brisbane, possibly because that state government has actively sought to implement programs for mining start-ups on the proviso that they're located in the state. That puts the country's major mining city Perth firmly in second place. Ironically, this is where start-up accelerators like METS Ignited are based. Melbourne and Sydney round out the top 5 cities for mining start-ups globally.

4.0 Some Examples of Mining Tech Startups in India

There are 26 Mining Tech startups in India as on 3rd December,2024 which include Cognecto, Einsite, Tecknotrove, Bidaal, Radiant Integrity Tech[1].

Here is the list of top 5 Mining Tech startups in India.

4.1 Cognecto

Objective: Smart fleet management solutions for the construction sector. Its platform offers features like location tracking, fuel monitoring, and maintenance management integrated with AI and sensors. It caters to mining, construction, material handling, and logistics sectors.

Key facts about Cognecto
Founded Year: 2019
Location: Bengaluru (India)
Stage: Seed
Total Funding till date: $487K
Investors: Inflection Point Ventures, First Port Capital and 3 Others
Latest Funding Round: Seed, Mar 28, 2023, $487KLogo of Einsite

4.2 Einsite

Objective: Use of AI to make industrial machines smarter. Einsite builds computer vision and IoT technology that makes industrial machines smarter and helps site managers make better decisions. Primary target markets are construction and mining, and Einsite's technology has been deployed to projects worth $2B across India and the US.

Key facts about Einsite
Founded Year: 2015
Location: Hyderabad (India)
Stage: Acquired
Investors: KPCB Edge, Alchemist Accelerator and 3 Others
Latest Funding Round: Seed, Jan 24, 2020

4.3 Tecknotrove

Objective: VR-based training simulators. It develops interactive game-based training systems for various applications. It mainly caters to automotive, mining, aviation, defense, and nuclear industries.

Key facts about Tecknotrove
Founded Year: 2002
Location: Mumbai (India)
Stage: Unfunded

4.4 Bidaal

Objective: Cloud-based suite solutions for the mining industry. It offers tools for surveying and planning, detection, and signaling, blind spot coverage, etc. It provides an IoT platform for analyzing mining operations. It provides software tools for collecting, storing, and managing data digitally. It also offers AI-interfaced cameras for workplace safety monitoring, automated traffic surveillance, etc.

Key facts about Bidaal
Founded Year: 2020
Location: Faridabad (India)
Stage: Seed
Total Funding till date: $66.9K
Investors: TEXMiN, IIT ISM and 2 Others
Latest Funding Round: Seed, Feb 19, 2022, $66.9K

4.5 Radiant Integrity Tech

Objective: Radiant Integrity Tech is a provider of ERP and business process management software solutions.

They have customized solutions for the following mining industries like base metals, granite, precious metals (Gold, Cooper), iron, uranium, coal, diamonds, limestone, oil shale, rock salt, and potash. Some of the features of the software include a Single point of accountability, flexibility, scalability, and others. The solution is SAAS-based software.

Key facts about Radiant Integrity Tech
Founded Year: 2000
Location: Chennai (India)
Stage: Funding Raised
Investors: Ascent Capital and 1 Other

5.0 Prominent Global Examples and Startup Trends

5.1 Mining Automation

The integration of automation, robotics, and drones enhances operational efficiency, safety, and accuracy in exploration and extraction processes. Automated machinery and drones minimize human exposure to hazardous mining environments and revolutionize data collection.

5.2 Mining Equipment Electrification

Electrification of mining equipment, from haul trucks to diggers, reduces reliance on fossil fuels, cutting greenhouse gas emissions and operational costs. Meanwhile, integrating renewable energy sources such as solar and wind into mining operations further diminishes the carbon footprint and aligns with global sustainability goals.

5.3 Connected Mining

Connected Mining encapsulates the deployment of IoT and advanced connectivity solutions, fostering integration between equipment, personnel, and operational systems, creating a synchronized, data-rich mining environment. Real-time data analysis and communication enhance decision-making, optimize production, and predict maintenance needs, minimizing downtime.

5.4 Sustainable Mining Practices

The focus on ESG emphasizes the adoption of practices that minimize environmental impact, from water conservation and eco-friendly extraction methods to rehabilitation of mined areas. It also involves transparent, community-engaged operations that contribute positively to local development.

5.5 Tailings and Waste Management

Innovative strategies for tailings management include dewatering technologies that reduce the volume of waste and advanced containment systems preventing leaks and contamination. Furthermore, the industry explores the reuse and recycling of tailings and other mining wastes, transforming them into valuable materials for construction and other industries.

5.6 A Mining Problem a Startup is Solving

Take the case of Endolith[2]. Endolith is a division of Cemvita, focused on sustainable mining practices to deliver the critical minerals essential for a cleaner energy future (Figure 1). Current product lines deliver enhanced recovery of copper, nickel, and lithium. With continuous innovation and strong industry partnerships, Endolith is leading the transition to low-impact, highly efficient mineral extraction processes.

Endolith is trying to revolutionize lithium extraction through advanced microbial technology. Geological surveys in the southwest U.S. have revealed substantial lithium-rich clay deposits essential for renewable energy.



Figure 1. The collaboration brings out innovation.

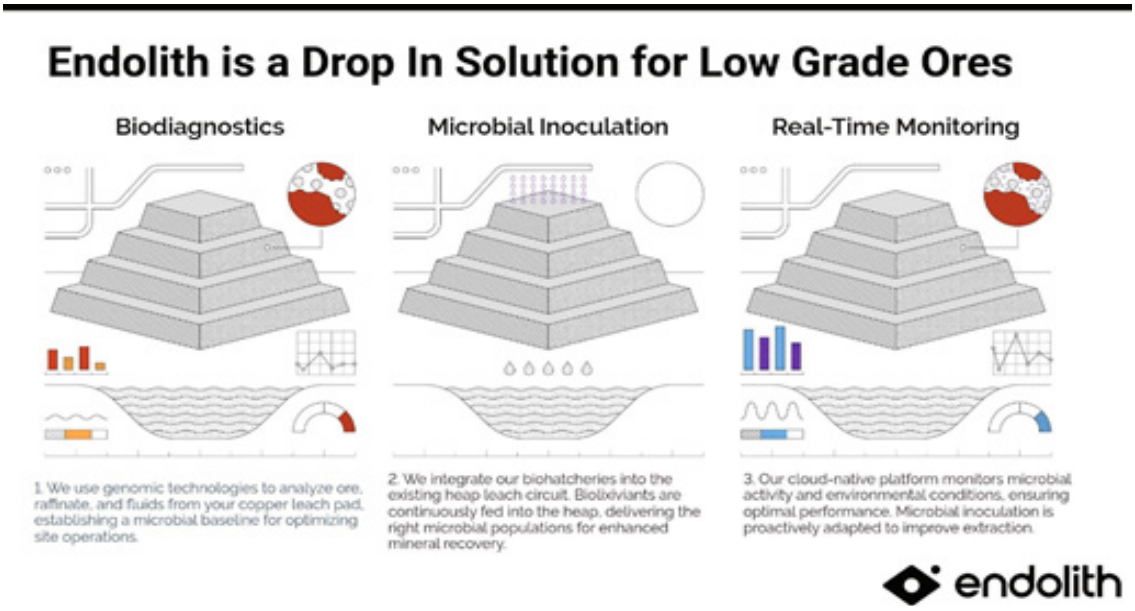


Figure 2. How microbiology and mining are coming together.

However, the high carbonate content in these deposits hinders the development of these resources. One of our solutions selectively removes carbonates before leaching, reducing sulfuric acid use and improving throughput and production. As per the grant in year one, the focus will be on optimization, targeting minimal feedstock input, maximal lithium leaching, and minimal leaching of gangue, or unwanted, materials. Year two will focus on the constructing and validating a pilot-scale bioprocess operation reactor in collaboration with one of Endolith's industry partners. The ambitious end-goal is to operate this reactor serially, processing multiple one-ton charges of lithium-bearing clay, and showcasing economic recovery of lithium (Figures 2 and 3).



Figure 3. The Endolith team carrying on the lithium research.

6.0 The State and Federal Governments Stepping in

Endolith, secured a $1.1 million grant from the Department of Energy (DOE) to harness microbes for sustainable mining. This funding will be directed towards the optimization and expansion of sustainable lithium extraction with an eye towards field deployment alongside industry partner Arizona Lithium, and supporting companies, Lithium Americas and Ioneer.

The Australian Renewable Energy Agency (ARENA) has announced a $10 million grant to Fortescue to develop, build, and demonstrate first of a kind fast chargers for heavy mine site vehicles. Fortescue's $35.3 million 'Fast Charger for Heavy Battery Electric Vehicles' project will develop 6 MW fast chargers, capable of charging 240 tonne battery electric trucks in under 30 minutes. ARENA CEO Darren Miller said the project would help reduce emissions in one of Australia's most carbon-intensive industries. "ARENA is working to reduce emissions from Australia's heavy industry, with heavy haulage high on the priority list for the mining sector." "Heavy haulage for remote mine sites contributes around a quarter of the mining industry's emission and is

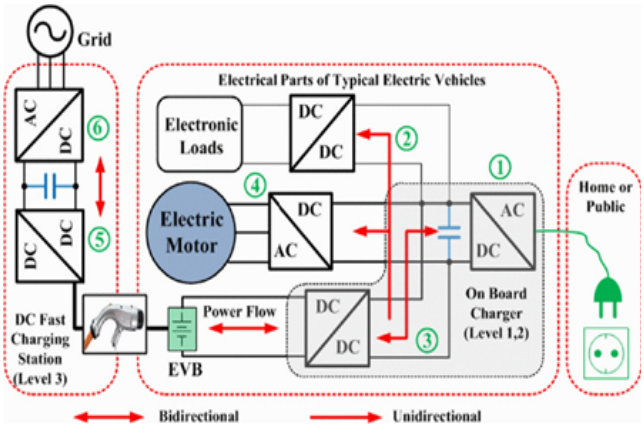


Figure 4. Electric Vehicles charging technology review.

considered a hard to abate sector, so we're investing in the technologies that will be part of the solution," Mr Miller said. The funding has been awarded under the Australian Government's Industrial Transformation Stream, part of the Powering the Regions Fund. This $400 million program aims to support emissions reduction at existing industrial facilities in regional Australia[3].

The project is the next stage of fast charger development for Fortescue, building on an existing 3 MW prototype. Once developed, the fast charger will be installed, demonstrated, and tested at Fortescue's Hazelmere and Christmas Creek mine sites. Typical fast charging technology has the architecture as in Figure 4.

Fortescue Zero CEO, Ellie Coates said, "Leveraging our world-class capability in battery and charging solutions from motorsport, the fast chargers have been developed for the challenging conditions of the Pilbara. Equipped with robotic connection options, they will be able to power Fortescue's future 240-tonne Liebherr T 264 battery electric trucks in just 30 minutes."

The current status of fast electric vehicle charging is as follows:

1. Lucid Air – 350 kW, 15 minutes. Lucid Air takes the lead with its remarkable 350 kW charging capacity.
2. Tesla Supercharger – 250 kW, 20 minutes. ...
3. Porsche Turbo Charging – 270 kW, 22 minutes.

7.0 Some Leading Global Startups in the SAMOG and MOGI sectors[4]

Advance note: Signal Strength gauges how much a company's influence has permeated the global ecosystem of startups, scaleups, and emerging companies. It is an IPR-protected service.

7.1 Impossible Metals

- **Founding Year**: 2020
- **Employee Range**: 11-50
- **Location**: USA
- **Signal Strength**: Very Strong
- **What they do**: Impossible Metals is a mining company that develops a fleet of autonomous underwater vehicles (AUVs) to harvest polymetallic nodules while preserving marine ecosystems. This mining company's pick and place manipulator technology, combined with advanced image-sensing, ensures minimal environmental impact. Further, its patented bacterial respiration method eliminates the need for harmful chemicals, reducing energy consumption, tailings, and environmental pollutants while ensuring rapid metal extraction, producing only neutral pH wastewater.

7.2 Airth.io

- **Founding Year**: 2021
- **Employee Range**: 11-50
- **Location**: USA
- **Signal Strength**: Medium Strong
- **What they do**: Airth.io offers AI-driven solutions that optimize the mining value chain, enhancing efficiency, safety, and profitability. Through strategic mine scheduling, comprehensive data platforms, advanced analytics, and financial tools, airth.io delivers actionable insights for smarter mining operations. Its ecosystem, including *Airth Plan*, *Connect*, *Act*, *Finance*, *Manage*, and *Aether*, integrates to provide a holistic view of operations, from heap leach production to stockpile management.

7.3 Reverse Carbon Mining Project

- **Founding Year**: 2022
- **Employee Range**: 2-10
- **Location**: Austria
- **Signal Strength**: Very strong

- **What they do**: Reverse Carbon Mining Project introduces a carbon sequestration approach that repurposes biogenic waste into char via pyrolysis and securely storing it underground, akin to coal. This initiative removes CO_2 from the atmosphere and revisits the essence of mining by "mining" carbon back into the earth, thereby reversing the carbon cycle.

8.0 Rio Tinto Initiative

A 10th April 2024 communique by Rio Tinto says the following[5]:

Rio Tinto has teamed up with a leading global venture studio and start-up investor to back the development and commercialisation of breakthrough technologies in the mining industry, supporting the company's efforts to find better ways to provide the materials the world needs. Rio Tinto will partner with Founders Factory and invest A$14.4 million in global pre-seed and seed stage start-ups over the next three years. The focus will be on technologies in the fields of safe mine operations, decarbonisation, exploration processing and automation.

Each start-up will receive a cash investment and participate in a four-month accelerator program run by Founders Factory to support product development and commercialisation. The Western Australian Government has also partnered with Founders Factory to invest in nature-tech start-ups that preserve and restore nature and biodiversity.

The partnerships with Rio Tinto and the Western Australian Government will support the first Australian hub of Founders Factory in Perth, Western Australia, boosting the state's innovation credentials. Founders Factory successfully operates in London, Johannesburg, Milan, Berlin, Bratislava, New York and Singapore.

Rio Tinto Iron Ore Chief Executive Simon Trott said, "Technology has always been at the forefront of our industry and Western Australia can be the Silicon Valley of the global mining industry. "Our iron ore operations in the Pilbara are among the most technologically advanced in the world. This exciting new partnership gives us the opportunity to build on our innovative legacy to unlock new technologies and help our business find better ways to provide the materials the world needs. "With the backing of industry and the State Government, local and international start-ups will receive investment opportunities and access to real-world testing and scaling support, helping Western Australia's innovation economy to grow."

8.1 Rio Tinto's Recent Acquisition

As of Oct 17, 2024 communique Mining giant Rio Tinto made global headlines with its recent acquisition of Arcadium Lithium for $6.7 billion, making it one of the top three lithium miners in the world. This move aligns with Rio Tinto's focus on the green economy, as lithium is a crucial component in electric car batteries[2]. But Rio Tinto is going a step further with the launch of an inaugural climate and deep tech accelerator for transforming and decarbonizing mining operations. The miner teamed up with Founders Factory to invest $14.4 million in global pre-seed and seed stage start-ups over the next three years. Investment will target technologies related to safe mine operations, decarbonization, exploration processing and automation. The mining industry flies under-the-radar in discussions on decarbonization, but it could account for as much as 5-7 % of global CO_2 emissions. It's a tough-to-disrupt sector that faces unique challenges on the decarbonization journey: the sector must dramatically reduce emissions while increasing production to match growing demand for critical minerals needed for cleantech. Production of metals like copper and nickel will need to be ramped up by 200-300% to support the energy transition, meanwhile emissions from mining will need to be cut by 90% by 2050.

However, decarbonizing mining presents unique challenges, including high energy consumption and operating in remote, harsh environments. Henry Lane Fox, CEO and Co-founder of Founders Factory, highlights three main challenges in decarbonizing mining: "First, there's no established blueprint for decarbonizing the mining industry. Unlike other sectors, no one has figured out a comprehensive approach. The energy consumption in mining is enormous, and many mining sites are in remote, harsh environments. For example, some mining locations in Western Australia are so isolated, that it's like operating on the moon. This makes it difficult to implement technologies that are resilient and long-lasting."

9.0 Western Australian Government Stepping Up

Western Australian Premier Roger Cook said, "Securing the internationally renowned Founders Factory for Perth is a major coup for our State.This is the first time the tech accelerator has operated in Australia, providing a springboard for innovative local businesses to reach an international audience and maximise their chances of success. My Government is committed to decarbonising our economy by 2050 and we must support local startups developing the technology to reach this goal."

"This 3-year partnership will further cement WA's position as a global leader in research and the development, helping to diversify the economy and create the jobs of the future."

Founders Factory CEO Henry Lane said, "We are excited to be partnering with Rio Tinto and launching operations in Western Australia. Startups can drive further productivity, safety and automation in the mining sector, whilst accelerating the industry's transition to Net Zero.

"This program can help international and local founders test their technologies with the global leader in the sector and find pathways to commercial scale and impact."

10.0 Why the Mining Industry is Embracing Startups

The global mining industry is a world leader when it comes to certain types of innovation, notably in the areas of automation and water use. However, much of this innovation wouldn't have been possible without start-ups.

A start-up is loosely defined as a new company or business. However, many new companies wouldn't necessarily consider themselves start-ups so it begs the question. What makes a start-up intrinsically different from other newly established businesses? One answer comes from Natalie Robehmed via a 2013 Forbes article. She mentioned that a start-up is typically distinguished by its 'ability to grow' rapidly and by the way it's 'designed to scale very quickly.

Some of the most successful businesses today started out as start-ups. Take WhatsApp, the mobile messaging app that Facebook paid a cool $19.4 billion for in 2014 because, in Zuck's words, it had at the time 'more engagement and a higher percentage of daily users than Facebook'. And who hasn't heard of Buzzfeed, also another start-up based on an idea that happened back in 2001. That idea has since morphed into a large conglomeration of platforms and well over half a billion viewers every month.

Various analysts have defined 5 things that make the difference between success and failure for a start-up. The biggest is the correlation with success is timing. If you get this right, you're off to a great start. Second is the quality of the team behind the start-up and their ability to put a plan of action in place and then execute it successfully. The idea surprisingly is only 3rd in importance for success or failure. Clearly, a good idea isn't going to get very far if it isn't the right time for it, or the team behind it doesn't plan and execute that plan well! Fourth in importance is the business model, and fifth is funding.

These factors make the world of mining start-ups very exciting. Timing for example. The next mining boom is now happening so the time is absolutely right for start-ups involved in technologies that can be utilised by the mining industry. Secondly, mining companies have begun to understand that many of the mining practices of the past are no longer socially, environmentally, or economically viable in today's world. That previously amorphous concept called 'social license to operate for example is very much alive and well, and empowering people in communities affected by mining to take a lot more interest in what's going on in their back yard. Then there is the very real shortage of qualified mining professionals, in part a legacy of the industry's history of boom and bust hiring and firing habits. Combine these and you have a situation ripe for start-ups who want to develop technologies that can assist the mining industry in addressing these and other issues.

10.1 Top 5 startups to watch in 2022[6]

a. Canadian startup KorrAI offers mining site digital twins through its cloud-based platform. The platform uses spectral images to create 3D representations of mining operations and provide insights into surficial mineral signatures. It reduces risks to infrastructure and the local environment by monitoring mass movement and surface deformation. Further, the platform enables

users to simulate site risk scenarios and interact with the 3D environment. Thus, KorrAI allows mining professionals to focus their field efforts on higher-value targets and train themselves better for on-site mining operations.

b. Spanish startup GeoKinesia builds a web-based geotechnical platform that leverages InSAR. It is a remote sensing technology that detects and measures displacements of land surfaces and structures. The platform provides historical analysis, synoptic view, and continuous measurements without any in situ presence. Once a user selects an area of interest, period, and types of analysis, the platform sends a report using an advanced class of InSAR processing technique — persistent scatterer interferometric chain of geomatics (PSIG). This way, GeoKinesia allows mine managers to remotely monitor sites along with early warnings and risk predictions.
c. VerAI is a US-based startup that streamlines AI-based mineral asset generation. The startup's proprietary platform uses machine learning to detect concealed mineral deposits in underexplored covered terrains. VerAI partners with explorers to build its platform's asset portfolios. It then utilizes these datasets to dentify the location of economic mineral deposits, addressing the challenge of undercover exploration. Thus, by increasing the probability of success in mineral discovery, VerAI enables mining companies to significantly shorten targeting time and reduce operational costs.
d. Opaxe is an Australian startup that provides a mining company database for the mining and minerals industry. The startup's software platform, myopaxe, collects, collates, and republishes company announcements by resource companies listed on the world's major stock exchanges. These announcements cover all aspects of the mining life cycle from initial exploration to production, enabling quick access to required information. The platform also produces business insights that allow mining professionals and investors to make informed decisions.
e. German startup TheiaX uses mineral spectroscopy to advance raw material discovery and characterization. The startup's solution, TheiaX CORE, identifies spectrally diagnostic minerals and their composition. It then maps their relative distribution, allowing the delineation of alteration domains. The startup's other solutions, TheiaX PIT and TheiaX MAP, enable semi-quantitative mineral abundance estimation and photogeological interpretation. This mineralogical data allows mine geologists to track ore types and take informed decisions on ore-waste separation (Figure 5).



Figure 5. The top 5 Mining Startups to watch in 2022.

Popular areas for start-ups that want to attract the interest of the mining industry are:

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Technology – currently over a third of start-ups in the mining industry are involved in developing technology that either provides solutions to existing problems or helps streamline various processes and procedures.

Automation and Remote Operation- It's also an area with huge almost unlimited potential in the industry, particularly with the growing focus on automation and remote operation. Start-ups involved in developing the wireless sensor networks needed to collect machine-to-machine data for example are attracting interest from mining companies. Likewise, the development of applications that utilise cloud networking to facilitate things like machine intelligence and learning, and automated mine site operations, are increasing of interest as is the development of machine learning itself.

Exploration data management systems to are moving online with web-based applications that allow users in multiple locations to access and work on the same data. In some cases, this data is also captured remotely via web-based applications. The technologies that make all this happen are increasingly being provided by start-ups who are in turn receiving funding from the industry.

Drones AKA Unmanned Aerial Vehicles or UAVs are another technology mining companies are increasingly interested in. The majors like Rio Tinto and BHP already use drones to carry out a range of tasks. Amongst other things, they're used to survey, inspect, and map areas considered unsafe work environments, including the tops of buildings, large pieces of machinery, and toxic waste dumps. One company is using drones to conduct inspections of vessels out at sea, and their use in underground operations is increasing.

Other areas of technology in which start-ups are providing considerable value to mining companies include:

Robotics such as autonomous field robots that can replace humans in dangerous work environments, deliver first-rate results and provide value for mining companies. Robots can also deliver autonomous services such as tree planting in rehabilitation programs.

Artificial Intelligence and machine learning that delivers increased exploration efficiency

Software development

3D printing and 3D imaging

Data collection and management, and big data solutions

Safer, more effective and accurate geological mapping

Advanced analytics and report analytics that ensure companies are compliant with respect to reporting requirements, and are equipped with up to the minute tools for analysing data, producing critical and accurate documents, and other necessary reporting functionality

App development

CAD applications

Mining relevant social network platforms that can provide crucial support systems and help networks for mining employees

Infrastructure solutions increasingly being provided by start-ups can be found in areas such as civil construction, FIFO, accommodation rentals, and catering and food services. This may include the development of spatial communication platforms that allow workers to build intelligent 360° virtual work sites before committing to the real deal. It may also include delivering operational systems that simplify and improve efficiency and sustainability in infrastructure construction and project management.

When it comes to operational considerations, start-ups are increasingly providing solutions that help mining companies:

Streamline and improve their extraction and processing systems by designing and implementing advanced process controls

Plan more effective maintenance schedules for equipment. This includes the use of automated technology within the equipment that monitors performance and provides advance notice of impending faults before they become expensive repairs

Optimise operational costs Human resources is a big target market for start-ups and an increasingly important one too. Here start-ups have been able to provide the industry with solutions to help with:

Better, more effective shift and roster planning, an important consideration for FIFO work forces

Recruitment processes

Implementation and delivery of comprehensive and tailored online staff training and education programs that ensure all team members receive standardised training / on boarding / orientation as required

Improved implementation and training around health and safety as well as identification of potential problems

The environment is another area where the mining industry is finding itself increasingly at odds with the community and also local authorities. Many companies are already doing something about it with the help of start-ups, including:

a. Remote monitoring of water resources including water quality, waste water treatment, water usage etc
b. Better management of waste generally including waste water, tailings, chemicals, campsite waste etc
c. Identification of wasted energy and implementation of more effective energy saving solutions

Start-ups are coming up with excellent solutions for finding exploration funding and other necessary funds.

And they're even helping management handle company image and shape reputation through platforms that can leverage market sentiment!

11.0 Acquisitions in Mining Tech

A "startup acquisition" refers to when a larger, established company buys a smaller, younger company (a startup), essentially taking ownership of the startup by purchasing its assets and intellectual property, often seen as a way for startups to exit the market and generate a return for investors; this transaction can involve payment in cash or company stock depending on the deal structure.

11.1 Key Points About Startup Acquisition[7,8]

- Buyer and seller

A larger company (the acquirer) purchases a smaller startup (the target company).

- Exit strategy

For startups, an acquisition is often considered a successful exit strategy, allowing founders and investors to realize a return on their investment.

- Reasons for acquisition

Larger companies may acquire startups to gain access to innovative technology, talented teams, new market segments, or to eliminate potential competition.

- Payment methods

The acquiring company may pay the startup founders and investors with cash, shares of their own company stock, or a combination of both.

In the year 2024, till November 2024, 5 acquisitions happened in Mining Tech sector. Last year, in 2023, a total of 3 acquisitions happened in Mining Tech sector[7,10] (Tables 2 and 3).

12.0 Last words

To cultivate a "startup promotion and acquisition culture" within a company, focus on embedding a mindset of agility, risk-taking, innovation, and a strong emphasis

Table 2. Here are some recent, important acquisitions in Mining Tech[7]

Company	Acquisition Type	Acquisition Date	Acquirers
indurad	Business Acquisition	Nov 21, 2024	Hexagon
Maintenance Experts	Business Acquisition	Oct 30, 2024	TMA Systems
INX Software	Business Acquisition	Jun 25, 2024	Accel-KKR
3GSM	Business Acquisition	Mar 13, 2024	Rocscience and 1 more
PeopleTray	Business Acquisition	Jan 23, 2024	Datamine

Table 3. Top Investors in Mining Tech European union is the top investor in mining tech companies based on number of companies invested

Investor	Location	Top Portfolio Companies
European Union	Brussels, Belgium	Sphera Solutions, Dassault Systems, Leica Geosystems, Worldsensing
Breakthrough Energy	Kirkland, United States	KoBold Metals, Mangrove Lithium, Lilac Solutions, GeologicAI
Prospect Innovation	Singapore, Singapore	Cemvita, SafeAI, talpasolutions, Phoenix Tailings
Chrysalix Venture Capital	Vancouver, Canada	MineSense, Rithmik
Y Combinator	Mountain View, United States	EARTH AI, Teleo, Stratum AI, KorrAI

on customer acquisition through clear communication of company goals, empowering employees to identify and pursue new opportunities, rewarding and fostering initiative, and co-creating a collaborative environment where everyone feels invested in growth and expansion[9,10].

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12.1 Key Strategies to Implement

a. Leadership and Mindset:
Define clear company goals and vision:
b. Articulate a strong vision that prioritizes growth, market penetration, and new customer acquisition, ensuring all employees understand the company's direction.
c. Promote a "growth mindset":
Encourage leadership to actively champion a culture where taking calculated risks, experimenting with new ideas, and learning from failures are valued.
d. Empower employees:
Delegate decision-making authority to teams and individuals, allowing them to take ownership of projects and drive initiatives.
e. Recruitment and Talent Management:
f. Hire for potential:
Look for individuals with a strong entrepreneurial spirit, adaptability, and a passion for driving growth.
Develop talent through training:
g. Provide ongoing training and development opportunities focused on sales, marketing, and customer acquisition strategies.
Performance-based incentives:
h. Implement a robust incentive structure that rewards employees directly for achieving acquisition and growth targets.
i. Collaboration and Communication:
j. Cross-functional teams:
Create teams that bring together individuals from different departments to work on acquisition initiatives, fostering collaboration and idea sharing.
k. Open communication channels:

Foster transparent communication across all levels of the organization, enabling quick feedback loops and idea generation.

l. Celebrate successes:
Publicly recognize and reward individuals and teams that contribute significantly to customer acquisition and growth.

m. Process and Innovation:

n. Agile methodology:
Adopt agile project management practices to quickly adapt to market changes and test new acquisition strategies.

o. Customer-centric approach:
Prioritize customer needs and feedback, using data to inform acquisition strategies and product development.

p. Experimentation and testing:
Encourage a culture of experimentation, where new ideas and approaches are tested and iterated upon regularly.

q. Key aspects of a startup acquisition culture:
Customer focus:
Deep understanding of customer needs and a relentless drive to acquire new customers.

r. Data-driven decision-making:
Utilizing data analytics to identify effective acquisition strategies and optimize campaigns.

s. Rapid iteration:
Continuously refining acquisition tactics based on results and market feedback.

t. Teamwork and collaboration:
A shared responsibility across teams to achieve acquisition goals.

13.0 References

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