Technology Convergence, Mega Trends and Social Innovation

Social Innovation

“The deployment of technology and new business models to bring about real positive change to the lives of individuals and societies, creating shared value.”

Mega Trends

Technology Convergence

Source: Frost & Sullivan
The Mega Challenges

CITIES
Making Growing Cities Liveable

MINING
Getting More from Less

MOBILITY
Reducing Transport Inefficiencies

AGRICULTURE
Feeding a Growing Planet

Image Source: Pexels, Freepik; Source: Frost & Sullivan
CITIES: Making Growing Cities Liveable

Global Infrastructure Need versus Spending, 2017–2040

- Global Infrastructure Need versus Spending, 2017–2040

Source: Frost & Sullivan
CITIES: Making Growing Cities Liveable

Smart Cities Success Factors, Global, 2017

<table>
<thead>
<tr>
<th>Success Factors</th>
<th>Description</th>
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<tbody>
<tr>
<td>Staying citizen-centric</td>
<td>While technology enables Smart City, strategies should be focused on citizens, and citizens should be involved in decision making. Technology is only beneficial when it improves people’s lives and creates for them a sustainable urban environment.</td>
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<tr>
<td>Centralizing strategy implementation with dedicated Smart City leadership</td>
<td>Without a centralized team to ensure that city agencies and initiatives are aligned with Smart City vision and strategy, the city risks investing in a portfolio of one–off projects that fail to truly forward the city’s core goals.</td>
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<td>Draw funding from a diverse range</td>
<td>Funding initiatives is a top barrier to Smart City development. However, resourceful cities are looking to a wide range of supporters, including philanthropic agencies and private entities, to drive initiatives.</td>
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<td>Aggregation data across city agencies</td>
<td>Cities achieve synergistic value in aggregating data across all agencies, including finding latent patterns only exposed through data examination and the ability to run ‘what if’ predictive scenarios for better city governance.</td>
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<td>Centralized systems to open up green spaces</td>
<td>Smart parking and traffic management, centralized security, district cooling and energy management.</td>
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Source: Frost & Sullivan
MOBILITY: Reducing Transport Inefficiencies

- Need to reduce congestion
- Rising tourism-driven demand
- Continued demand from the resources sector
- Need for safer and healthier transport
- Freight sector growth
- Integrated mobility / multi-modal models

Source: Frost & Sullivan
MOBILITY: Reducing Transport Inefficiencies

Operation-wide Improvements

Asset Management

- Traffic Management
- Safety Systems
- New Aftermarket business models
- Big-data-driven new products and services

Manufacturing

- Predictive maintenance analytics
- Performance forecasting to
- Advanced Manufacturing
- Lightweight materials
- Advanced Propulsion
- Emissions Reduction

Source: Frost & Sullivan
MINING: Getting More from Less

1. **Smarter Exploration:** Need to identify physical properties, chemical properties for minerals directly in the field and address challenges from the early stages of exploration.

2. **Efficient Mining Methods:** Need for real-time monitoring of the rock flows and ore through the processing plants and mines.

3. **Safer Working Conditions:** Need to increase sophistication in transportation and underground mining.

4. **Minimising Environmental Impact:** Need to identify a solution to deal with acid mine drainage.

5. **Minimizing Airborne Emissions:** Need to reduce emissions from the combustion of fuels used in stationary equipment and vehicles.

6. **Reduction in Noise:** Need to simplify processes because vibrations and shocks can lead to noise and collapse of a structure.

7. **Digitisation:** Mines have lacked technological support, there is a need to effectively bridge the gap between business operations and end-user demands.

Image Source: Pexels; Source: Frost & Sullivan
## MINING: Getting More from Less

<table>
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<th>Benefits</th>
<th>Technologies</th>
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<tr>
<td>Flexibility to adapt to market needs</td>
<td>Smart Sensors, Drone Technologies, Autonomous Vehicles, Robotics</td>
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<td>Quick access to knowledge experts and documents</td>
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<td>Integrated value chain</td>
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<td>Building customer relationships</td>
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<td>Environmental standards</td>
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<td>Global footprint – better control</td>
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<td>Track and trace</td>
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<td>Equipment failure and maintenance</td>
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<td>Easy access to data</td>
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<td>Economic uncertainty</td>
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<td>Focus on customisation</td>
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<td>Production efficiency</td>
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<td>Product innovation – Remain competitive</td>
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Well over 1 million IoT sensors and devices in fixed plant in Australia’s mining sector

Source: University of Sydney and Frost & Sullivan
AGRICULTURE: Feeding a Growing Planet

Dietary shifts and economic development driving increased per capita food consumption

Population growth driving overall demand for agri-food

Decline in global arable land

Climate change threat to food security

Increased food safety concerns

Productivity losses and supply chain inefficiencies

Demographic shifts in farming communities

New and growing feedstock demand from the bioenergy industry

Source: Frost & Sullivan
AGRICULTURE: Feeding a Growing Planet

Potential Impact of Digital Transformation on Agricultural Gross Value of Production (GVP)

$7.4 billion
Automation and labour savings
(e.g. machinery, animal handling and product processing)

$2.9 billion
Genetic gains through objective data
(e.g. animal and variety selection)

$2.3 billion
Tailoring inputs to need
(e.g. fertiliser, seed and water)

$1 billion
Market access and biosecurity
(e.g. pest and disease control)

Source: CSIRO, CRDC, Frost & Sullivan
Making it happen

1. It's not about the device or technology
2. Identify and explore adjacent benefits of technologies to widen use cases and benefits for improved ROI
3. Open protocols, vendor-agnostic platforms, synergistic partnerships
4. Partner with an end-to-end Solutions Provider with a proven track record, who understands your business and thinks long term

Source: Frost & Sullivan
Frost & Sullivan, the Growth Partnership Company, works in collaboration with clients to leverage visionary innovation that addresses the global challenges and related growth opportunities that will make or break today’s market participants.

For more than 50 years, we have been developing growth strategies for the Global 1000, emerging businesses, the public sector and the investment community.

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