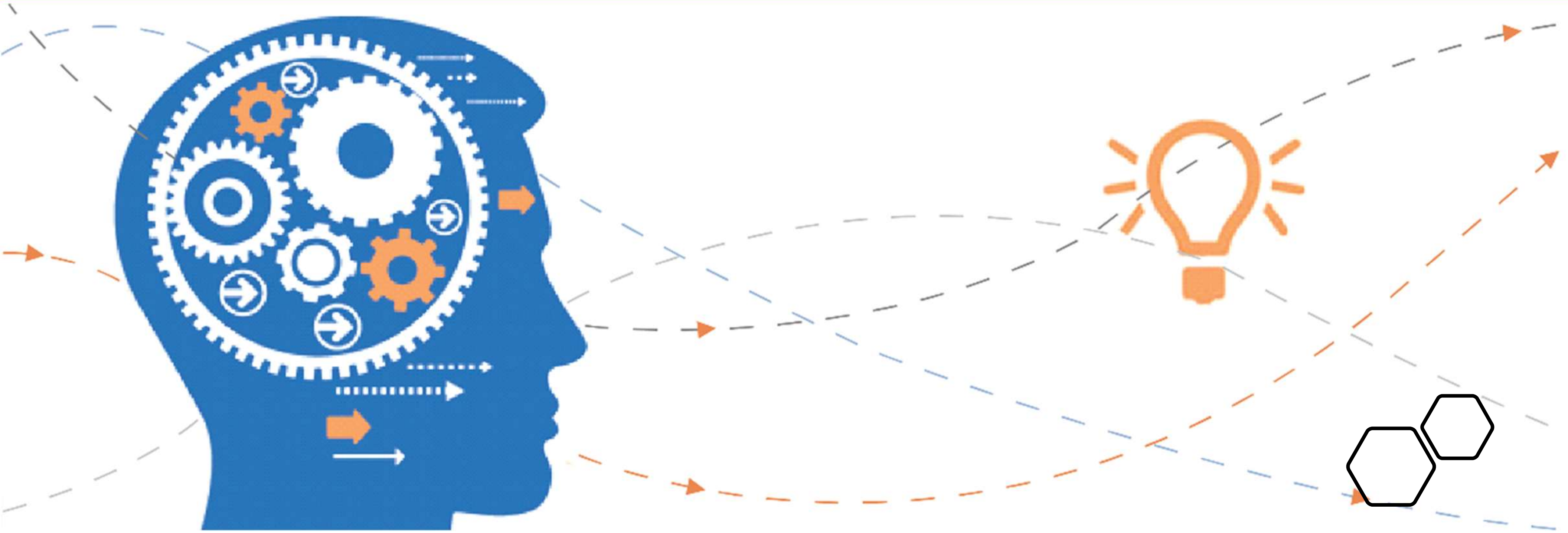
IND Submission 46
Recv'd 09 Sept 2020

Predictive Technologies Using Artificial Intelligence

Federation of Indian Associations of Western Australia
FIAWA
United WA Indians Building Better Future



Presented by: Bimal Kaul

Objective: Create 150,000 New Jobs by 2024

GOVERNMENT OF WESTERN AUSTRALIA

Diversify WA

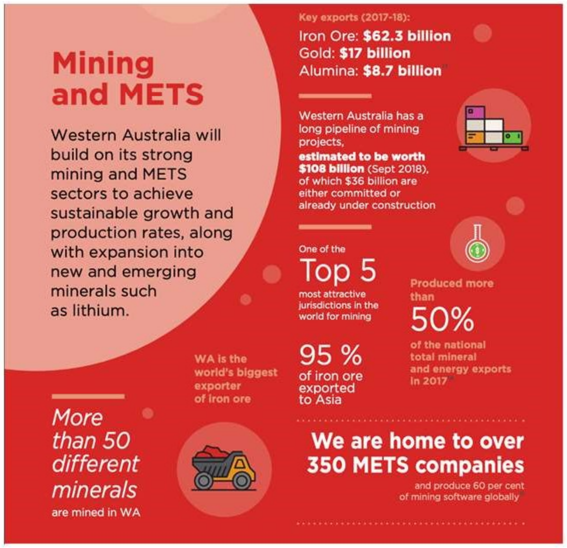
Strong Economy
Creating Jobs
Diverse Industries

July 2019

Priority Sectors

- Mining & METS
- Energy
- Tourism & Events
- International Education
- Technology & Manufacturing
- Primary Industries

I believe that Western Australia can contribute to achieving its goal of a strong resilient economy by partnering with India-based Artificial Intelligence (AI) Companies



Mining and METS

Western Australia will build on its strong mining and METS sectors to achieve sustainable growth and production rates, along with expansion into new and emerging minerals such as lithium.

Key exports (2017-18):
Iron Ore: **$62.3 billion**
Gold: **$17 billion**
Alumina: **$8.7 billion**

Western Australia has a long pipeline of mining projects, **estimated to be worth $108 billion** (Sept 2018), of which $36 billion are either committed or already under construction

One of the Top 5 most attractive jurisdictions in the world for mining

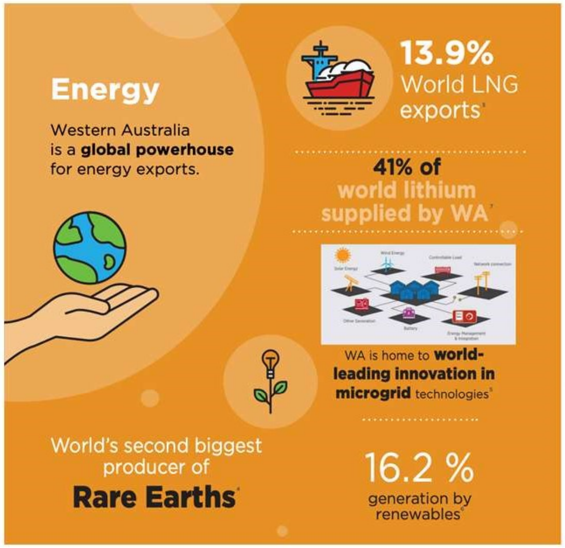
Produced more than 50% of the national total mineral and energy exports in 2017

WA is the world's biggest exporter of iron ore

95 % of iron ore exported to Asia

More than 50 different minerals are mined in WA

We are home to over 350 METS companies and produce 60 per cent of mining software globally



Energy

Western Australia is a **global powerhouse** for energy exports.

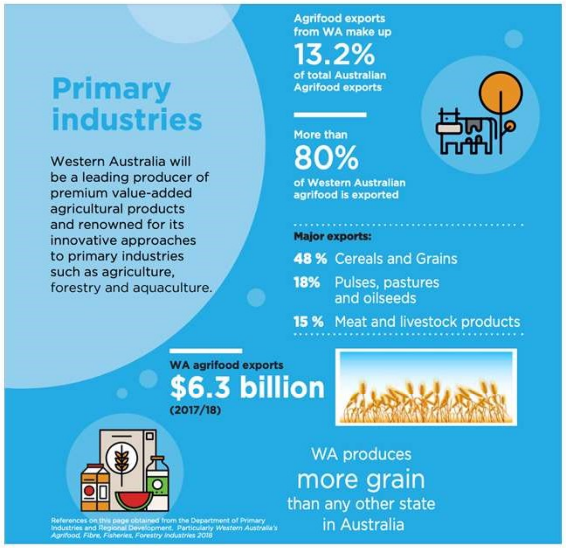
13.9% World LNG exports

41% of world lithium supplied by WA

WA is home to **world-leading innovation in microgrid** technologies

World's second biggest producer of **Rare Earths**

16.2 % generation by renewables



Primary industries

Western Australia will be a leading producer of premium value-added agricultural products and renowned for its innovative approaches to primary industries such as agriculture, forestry and aquaculture.

Agrifood exports from WA make up 13.2% of total Australian Agrifood exports

More than 80% of Western Australian agrifood is exported

Major exports:

48 %	Cereals and Grains
18%	Pulses, pastures and oilseeds
15 %	Meat and livestock products

WA agrifood exports **$6.3 billion** (2017/18)

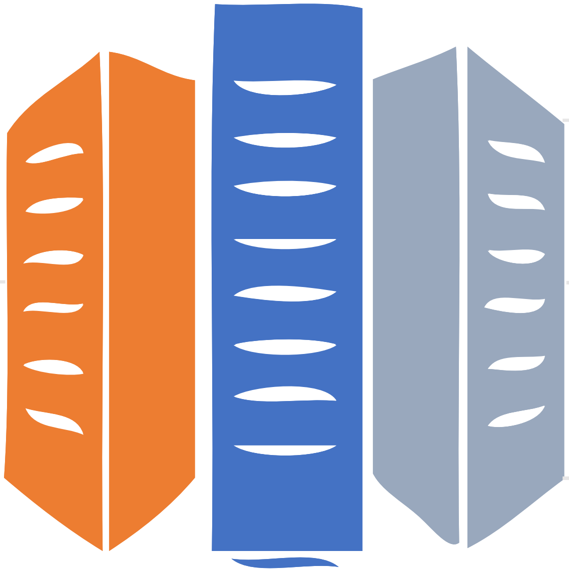
WA produces more grain than any other state in Australia

References on this page obtained from the Department of Primary Industries and Regional Development. Particularly *Western Australia's Agrifood, Fibre, Fisheries, Forestry Industries 2018*

Industry Benefits

Benefits	Mining & Mets	Energy	Primary Industries
Cost Savings	• Optimize Haul Cycle Time - $50 M • Process optimization – 10% increase in production	• Predictive Machinery Maintenance • Detect signs of corrosion	Detect plant disease, pests & poor plant nutrition through image recognition
Faster Decisions	Detect potential failure planes on rock surfaces 3x faster	• Assistance with chat bots for field operators	Seasonal forecasting to adjust water & fertilizer usage
Improved Health & Safety	Identifying gaps in operator capabilities	Monitor PPE usage 24x7	“see & spray” for pest & weed control
Smaller Environmental Footprint	Optimize energy usage – 3% reduction	Reduce methane flaring by accurate production forecasting	Precision sowing
Quality Improvement	Identifying metal grade through image recognition	Utilize real time telemetry to predict product mix	Field inspection using drones Identify farm produce output through image recognition

India is a leading country for AI talent & capabilities



Strong existing IT sector has been focused on developing strong AI capabilities

3rd largest number of AI engineers & startups (after US & China)

Leading US companies such as Google, Facebook, Amazon & Microsoft are already leveraging India as a base for AI development

Fluent English-speaking qualified workforce

Indian Government committed to developing AI as a national capability

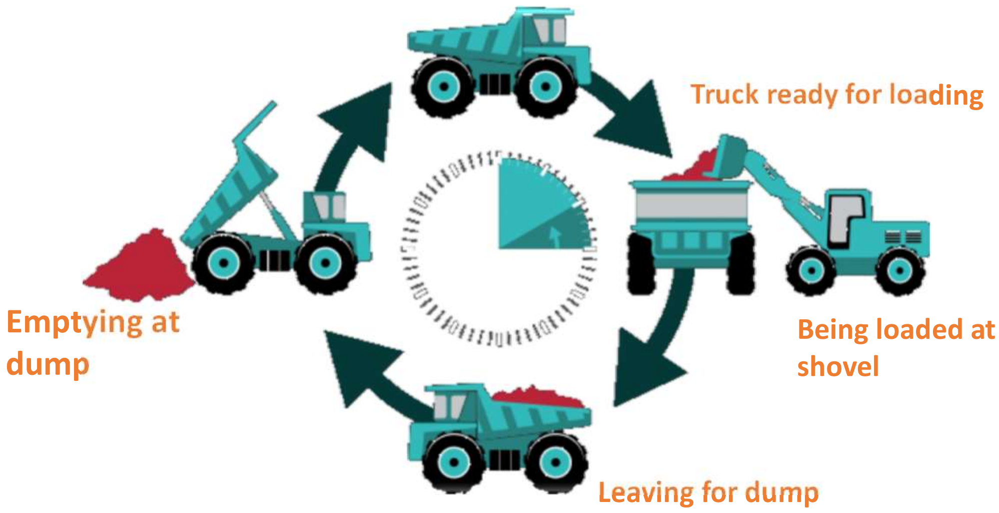
India is 2:30 hours behind of **WA**. The most convenient **time** to accommodate Co-working on Projects

A Case Of Big Data Implementation

CATERPILLAR
CAT
777G
CAT

Client has 250 such sensors on every truck emitting almost 100 GB of data every year

Example 1 – Optimization Haul Cycle For An Open Pit Mine


Truck ready for loading
Emptying at dump
Being loaded at shovel
Leaving for dump

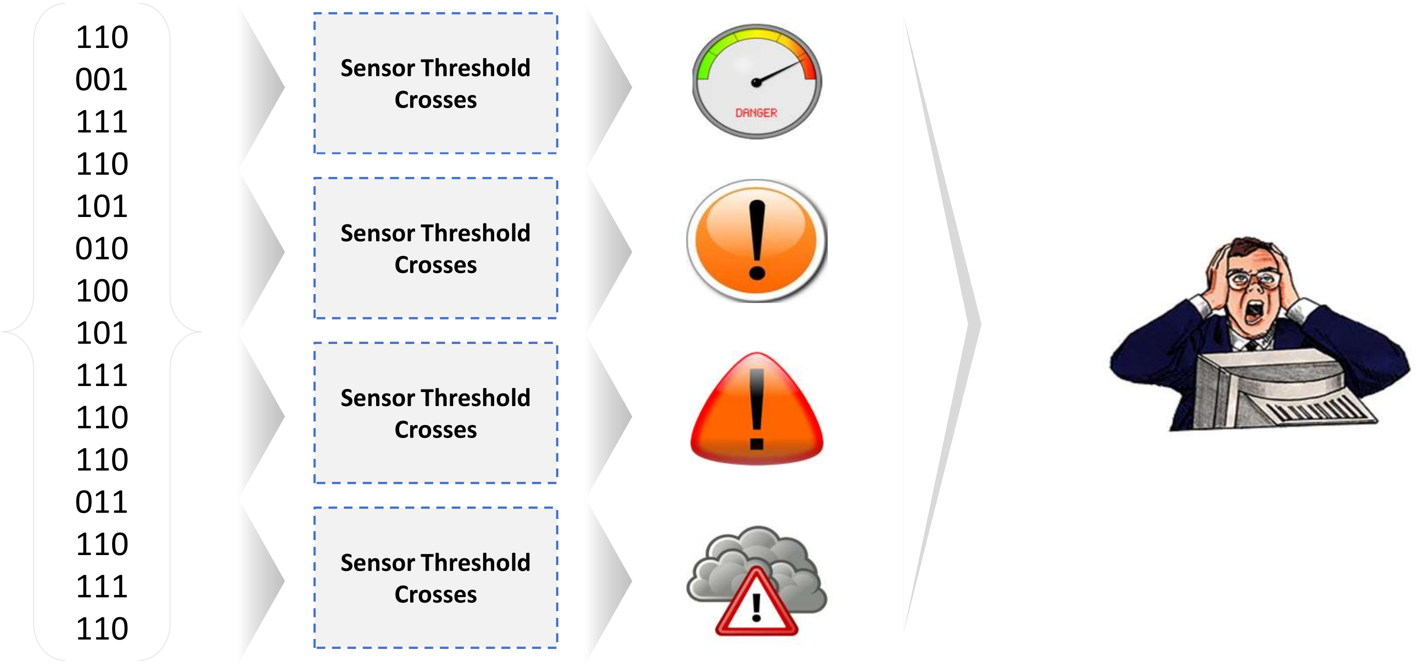
Haul Cycle Optimization

- Improving the efficiency of a haul (from shovel to dump) cycle is of utmost importance for the mining business
- Identifying root causes of inefficiency in haul cycle could help in:
  - Optimizing Fleet Utilization
  - Pre-emptive road maintenance
  - Defining best Operator’s practices / Best route utlisation

FROM INFORMATION TO INSIGHTS...
CONNECT THE DOTS.

Alerts!! - Lots Of Them

- **More than 1000 kinds of alerts**
- **With over 250 trucks, there can be more than 20 alerts generated per minute**



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Sensor Threshold Crosses

Sensor Threshold Crosses

Sensor Threshold Crosses

Sensor Threshold Crosses

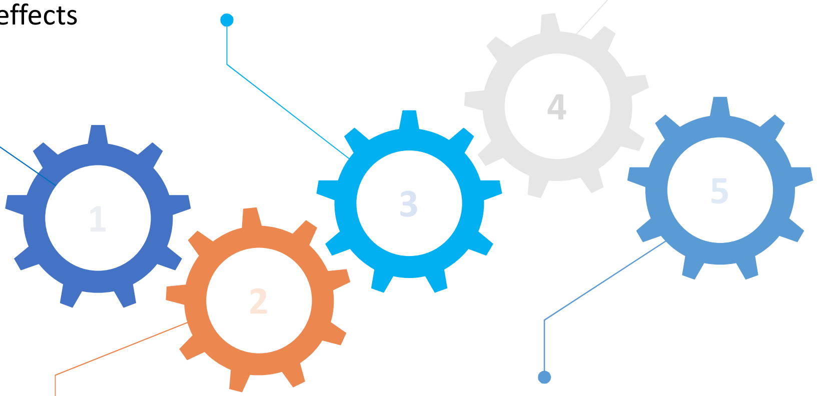
Sensor Data

Millions of Un-prioritised Alerts

Difficult to handle

Prioritization Of Alerts – How Is It Done?

Millions of Uncategorized Alerts



Data: Effect of the alert
Identify what happens in the aftermath of the alert

Unsupervised Learning
Run various unsupervised learning techniques

Identification of Clusters
Identify clusters of alarms with similar effects

Profiling and defining priorities
Profile similar alarms according to profiling parameters

Final Priorities
Give out final priorities

In a current M2M data project, the number of alarms which had to be taken care of immediately was 3% of the total alarms

AI Companies in India

• Absolutdata	www.absolutdata.com
• Intello Labs	www.intellolabs.com
• Attentive AI	www.attentive.ai
• Flutura	www.flutura.com
• Aganitha Cognitive Solutions	www.aganitha.ai