



M Ahsan Mahboob Head of DigiMine

Digital Systems for 21st Century Mining

AMIHRP VISIT TO DIGIMINE



27 September 2021

SIX MULTI-DISCIPLINARY TWENTY-FIRST CENTURY INSTITUTES DOING APPLIED RESEARCH



The City Institute



The Evolutionary Studies Institute



Sydney Brenner Institute for Molecular Bioscience



Wits Mining Research Institute



The Institute for Wellbeing and Development



The Global Change and Sustainability Research Institute

Innovation
for 21st century mining

Wits Mining Institute (WMI)



Vision

Innovation in the extractive sectors through skills, modernization and sustainable development of Resource-Rich Africa

Mission

Doing research and growing talent for sustainable 21st century mining

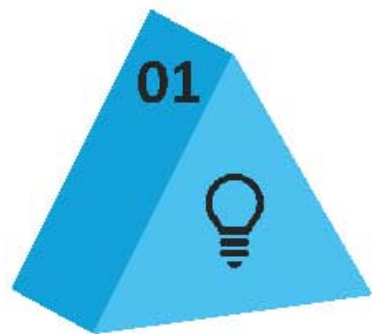
UNIVERSITY OF THE
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JOHANNESBURG



Digital Systems

- Digital hardware and software components (internal and external) used to **transform data** into a **digital solution**. When digital systems are connected, they form a network.
- The digital systems are the **glue** that joins all elements of the physical entity, the data, knowledge components and the people who envision, create, build, test and operate the facility.
- There is no other glue that can stick these **things together** and being integrated and working together is essential for success.

Digital Technologies and Mining



Efficiency, Cost,
Productivity



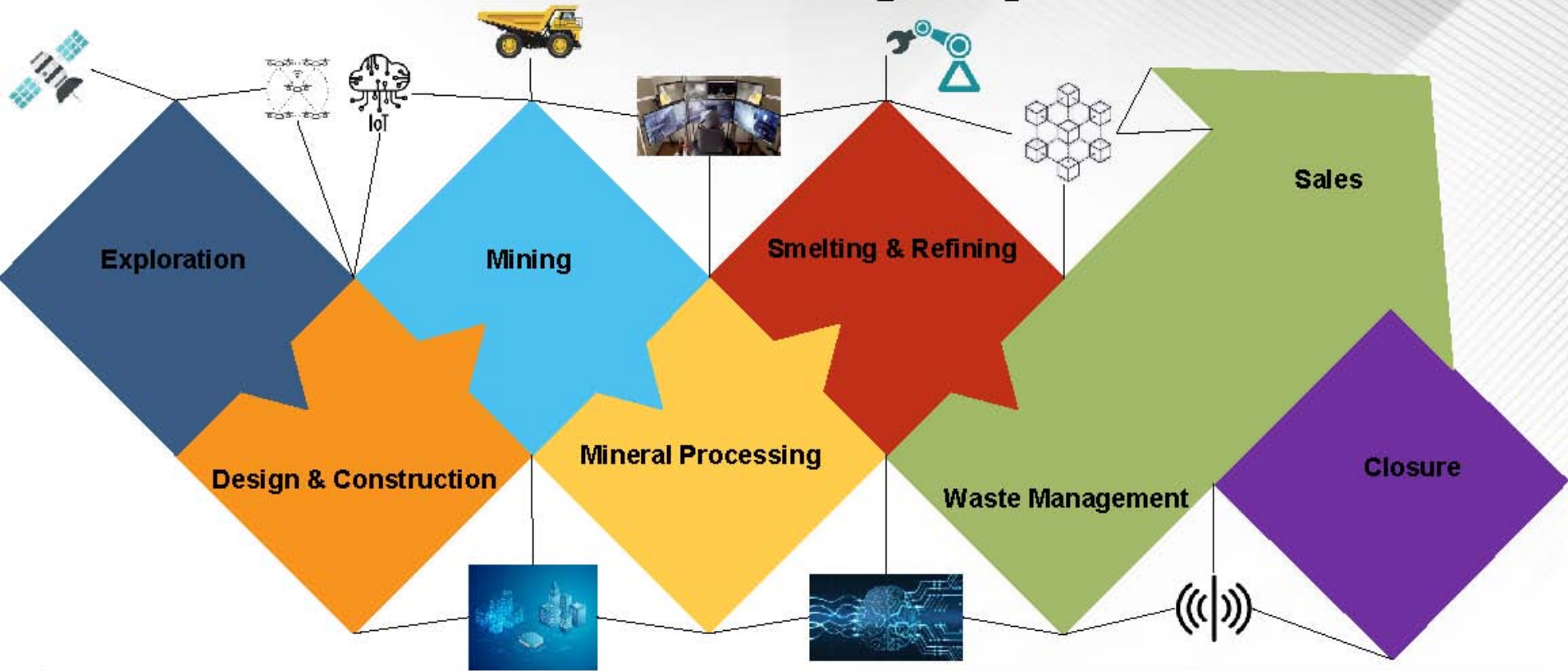
New more
complex
deposits



Social and
Environmental
Awareness



Connected Mining Operations



KEY TECHNOLOGIES OF 21ST CENTURY

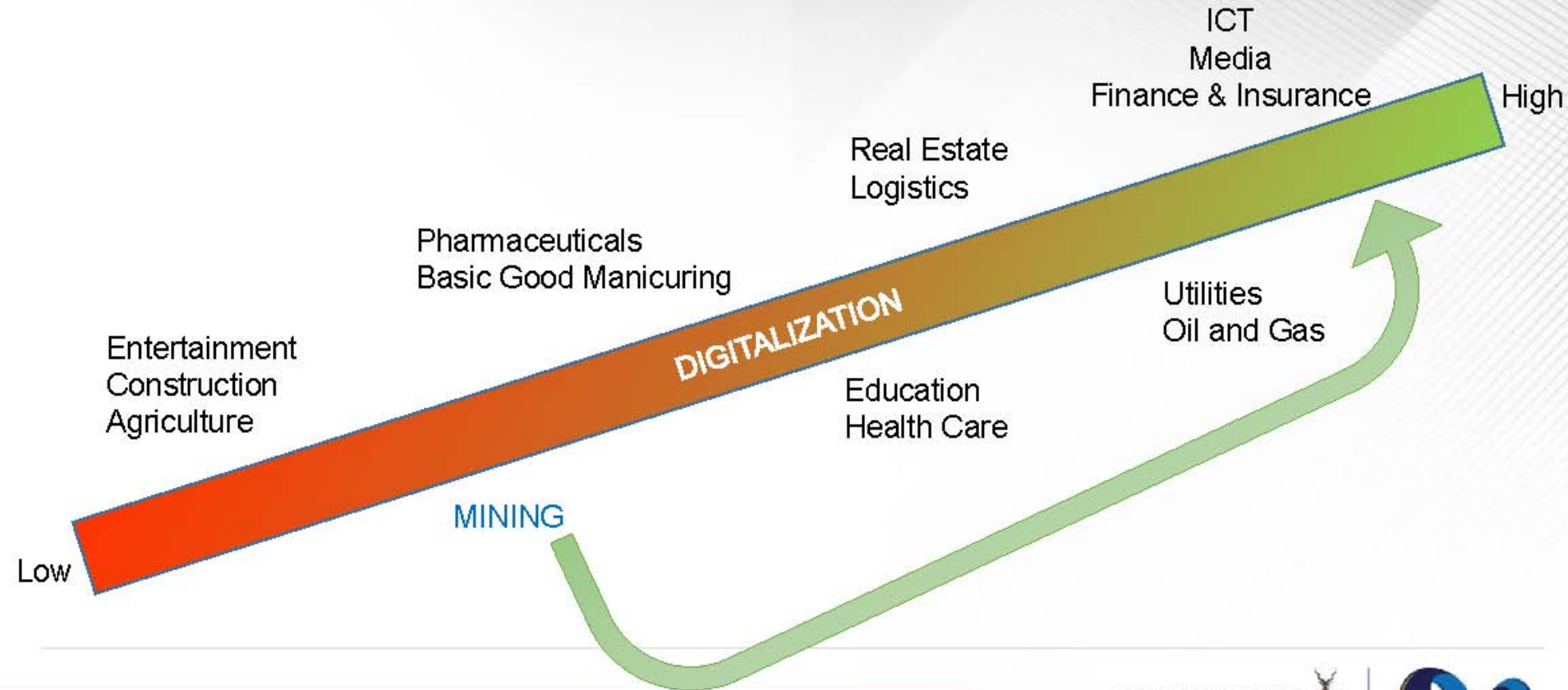


Connected Mining Operations

It will be a Complex World but at the End it's
all about Extracting Value and Efficiency
from Data Available to Us for Better and
Informed Decision Making



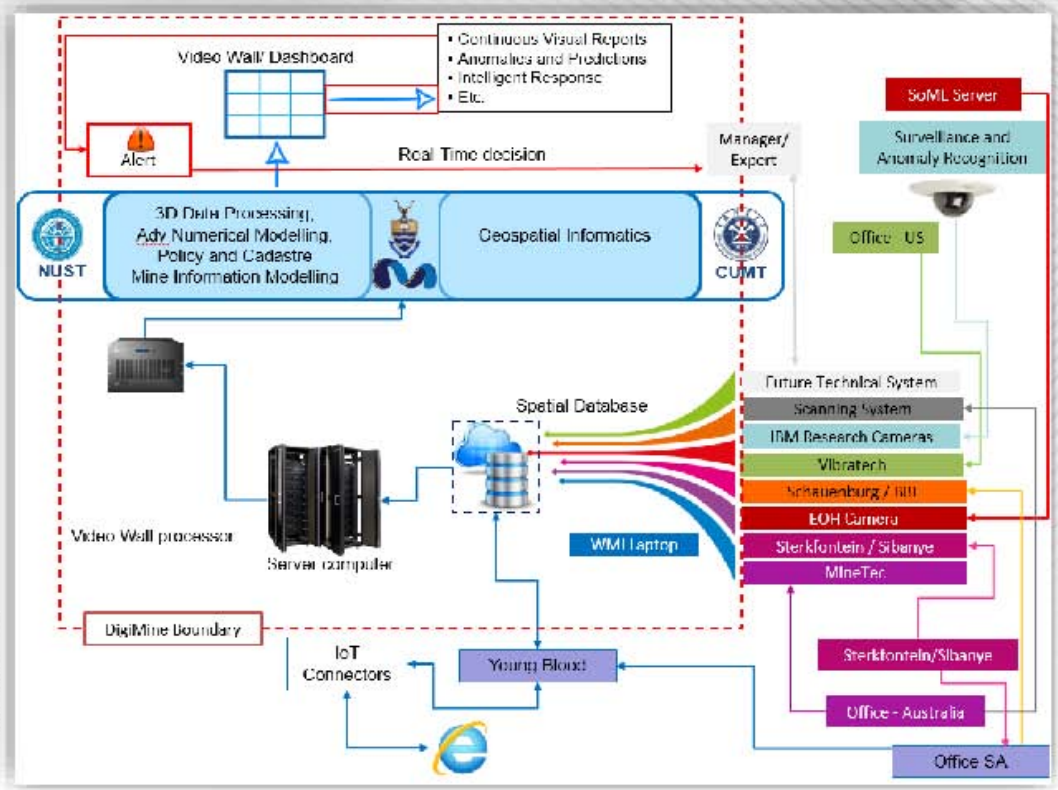
Digital Technologies Adoption



DIGIMINE RESEARCH AGENDA

- Anything Digital that can reduce risk
- Research, Install & Test Technologies
- Innovate through R&D, Improvement
- Technology development

Our aim is to give mine workers and management the right information to make the right decisions on mine health, safety and efficiency at the right time.



1 WIRELESS COMMUNICATION SYSTEMS
Reliable, multi-purpose underground communication systems

Technology development

Systems testing

Smart Surface applications underground

2 HEALTH, SAFETY AND SECURITY
Real-time, intelligent risk management

Remote visual inspections

ANSI Mine stream build-up

Miner's Health Assessment

Integrate DigiMine to track location, assess safety and take care for underground conditions

ANSYS modelling of air flow

2 SURVEYING, MAPPING & NAVIGATION
Making GPS and real-time mapping work below the ground

From fixed to network networks

From surface to underground

From 2D/3D to 4D

From 2D/3D to 4D

4 SYSTEM INTEGRATION FOR SMART MINING

Real-time system

Asset tracking

System integration

Optimizing density maps

Smart economics

Enabling research for the mine of the future

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Thank You

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