The Role of Artificial Intelligence in Shaping Future Construction Scenarios
Mapping the strategic environment

Necessity of developing Green projects
- Mega trends: Impact of:
  - Internet of Things/ Big Data/ Block chain
  - Artificial Intelligence
  - Sustainability and Carbon footprint
  - Climate Change on projects scope
- Application of 3D Printing in projects
- Future of Autonomous Vehicles
- Reduction in Project Portfolio
- Sustainable Developments Goals
- Government Policies and strategies (Science, Technology, and Innovation Policy, National Agenda, etc.)
- Collaborative governance in public polices
- Policies and legislation

Competitiveness

Private Sector (Mega developers/ consultants/ contractors/ suppliers)

Master plan of each emirate

Local Governments (Municipalities/Public works dept. etc..)

Federal entities (FEWA/TRA/ MOI/ MOJ/ MOE/ MOH)

Infrastructure

Contextual Environment (factors)

Construction Technologies and Automation

Consumption of natural resources in construction materials

Smart Cities

Etihad Rail

Transactional Environment (actors)
Organizing the uncertainties

- Future of Autonomous Vehicles
- Internet of Things/Big Data/Blockchain
- Reduction in Project Portfolio
- Artificial Intelligence
- Climate Change

Uncertainty of Outcome: Ignorance

- Etihad Rail
- Consumption of natural resources in construction materials
- Smart Cities
- Application of 3D Printing in projects
- Sustainable Developments Goals

Impact on Transactional Environment; Discomfort

- Construction Technologies and Automation
- Policies and legislation
  - Sustainability and Carbon footprint
  - Impact generated from buildings and construction
- Necessity of developing Green projects
- Collaborative governance in public policies

Government Policies and strategies
- Science, Technology, and Innovation Policy, National Agenda, etc.
Project Concept

Ministry of Infrastructure Development in UAE - started December 2017 to invent and design the first customized humanoid Robot. The Robot is an expert consultant Engineer using AI predictive analytics models and other Innovative technologies at four main stages:

- Project Planning,
- Design
- Execution and closing
- Operation and maintenance.
Project Concept

Robot is built to complement ministry’s

- BUILDING INFORMATION MODELING - BIM
- ROADS MODELING

to calculates complex models with powerful element and a comprehensive collection of design to help engineers and contractors achieve results in a smoother and collaborative ways according to MOID processes, forms and regulations using AI & digital transformation technologies
MAIN FEATURES

Stages of development
PROJECT PLANNING

STAGE 1

Generate customized reports for projects:

- Duration
- Cost assessment
- Risk assessment
- Preferred locations
- Recommended standards
- Benchmarking
- Needs and requirements
The Robot will be deeply evolving its abilities in MOID core businesses to:

- Validate recommended structural codes
- Compare best practices
- Select specifications
- Calculate BOQ
- Value Engineering
- Automate structural and MEP design
EXECUTION AND CLOSING

STAGE 3

Monitor projects to analyse execution through an automated drone controlled by the robot AI brain

- Compare execution results
- Track project milestones
- Send alerts & notifications
- Avoid unforeseen failure
Finally robot will use building facility management and asset management concepts to monitor and control:

- Infrastructure assets
- Receive, manage and detect patterns
- Take preventative actions
- Project life cycle
- Optimize project cost and time
BENEFITS
Outcomes and benefits
BENEFITES
Outcomes expectations

- Meets global infrastructure demands
- Present MOID Future vision
- New delivery model expectations
- Ability to deliver information faster
- Reduce project time & cost
- Create better best management

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BENEFITS

Project benefits

Better Decision making  
Greater duration predictability  
Prevent errors

Optimized project design  
Improve schedule  
Better understanding

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