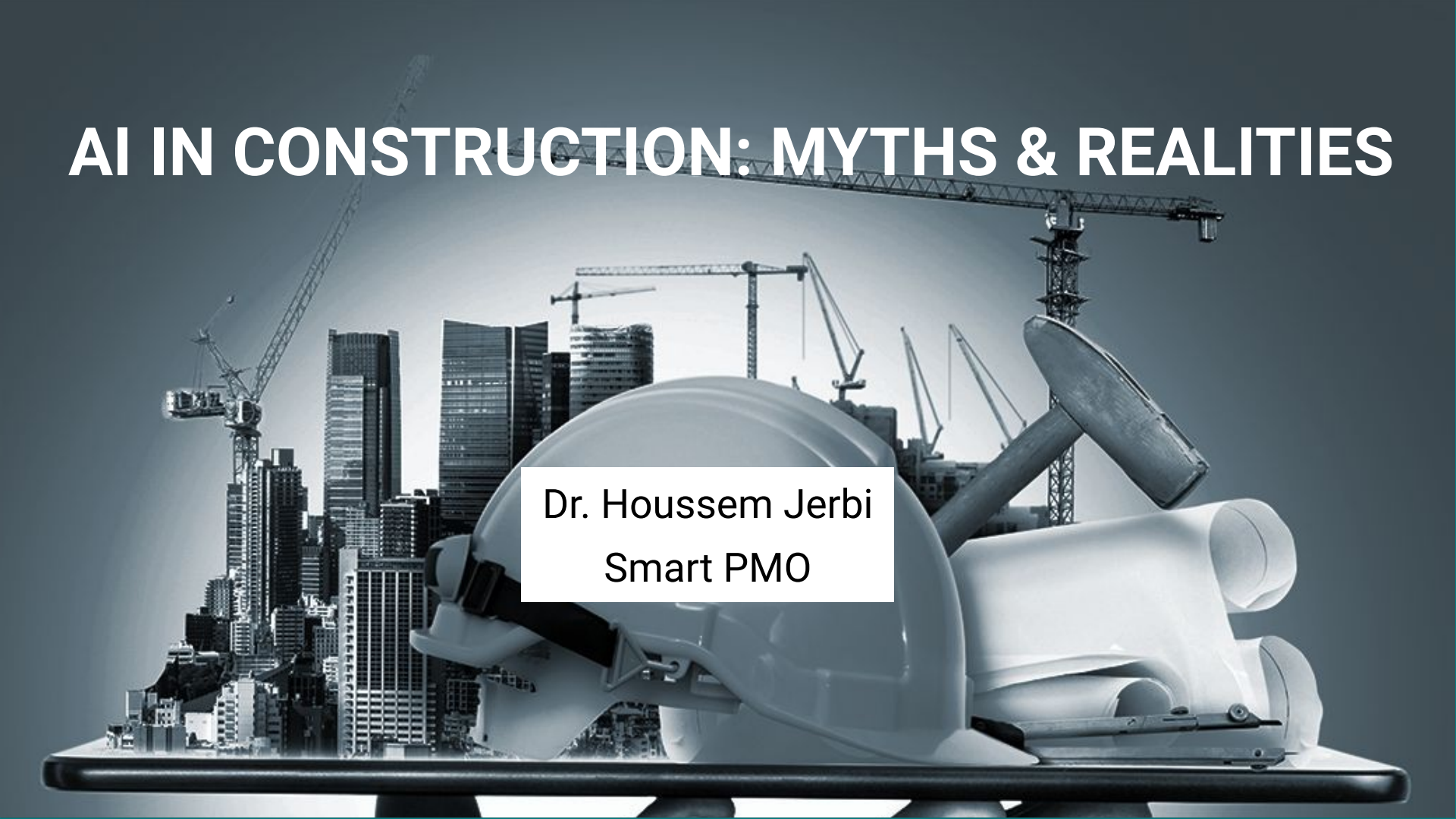
AI IN CONSTRUCTION: MYTHS & REALITIES



Dr. Houssem Jerbi
Smart PMO

ABOUT ME

- 17+ years of **international AI experience** in Government, Construction, AdTech, EdTech, Manufacturing, Transport, Finance sectors.
- Founder & CEO of Smart PMO.
- Former lead Data Scientist at **Facebook** and multiple **multinationals**.
- **AI strategy Advisor** to CxOs and senior leaders in EU and US.
- Experts **panel member** of Irish government Build Digital project.
- Chair of the Construction Cluster Ireland steering committee.
- **PhD in Artificial Intelligence** from University of Toulouse, France.

facebook | Rialtas na hÉireann Government of Ireland | Insight

- Award-winning AI product & services firm with global operations.
- We solve complex industrial problems in construction and engineering using AI & data science and state-of-the art business processes.
- We have since 2017 developed first AI software SPMO AI to provide integrated reporting and improve Risks predictions, benchmarking and explanations throughout the project lifecycle at portfolio, project and activity levels.

Partner

Microsoft Azure

AI supplier for

GOV.UK Digital Marketplace

Awards

IRELAND CIVIL & construction

Highways UK ROADS FOR A MODERN BRITAIN

LARGE CONSTRUCTION PROJECTS… THE PRODUCTIVITY ISSUE

75%

Delayed by 10+%
vs planned

59%

10+% over budget

** Climbing the Curve, KPMG Global Construction Project Owner's Survey*

WHY THINGS GO WRONG?

Project team changes

Biased estimations

Poor Data Quality

Undefined uncertainties

Increased Project Complexity

Inadequate Risk Management

Ineffective contingency plans

Dark Data

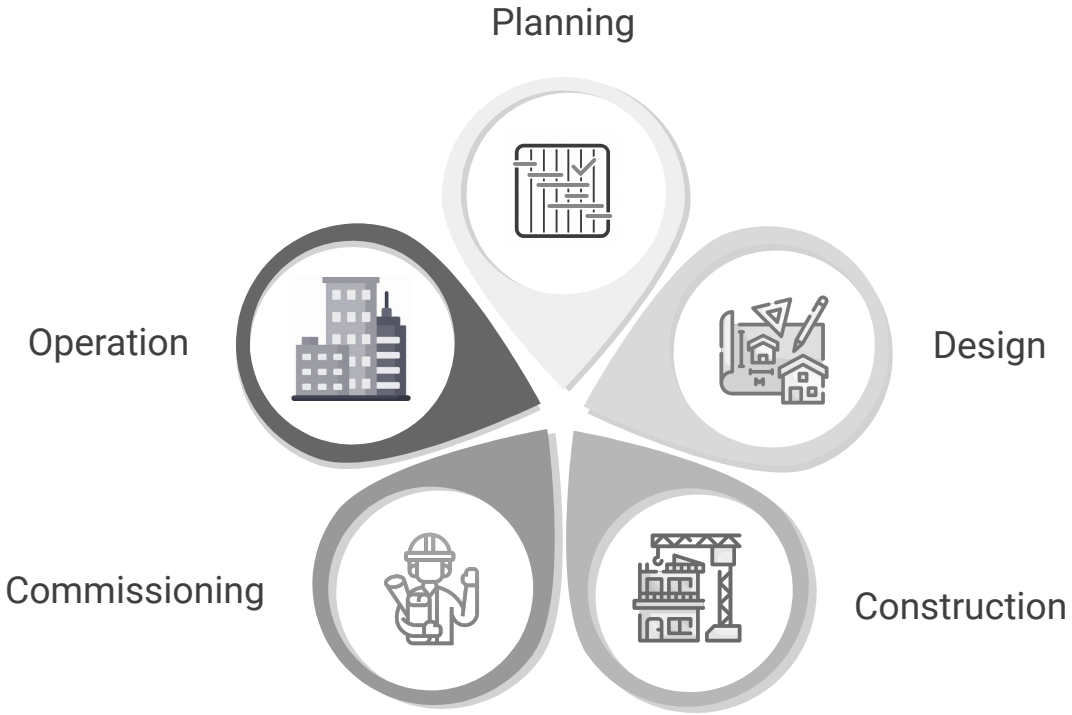
Supply chain

** Climbing the Curve, KPMG Global Construction Project Owner's Survey*

AI ... BEYOND THE BUZZWORD

- GenAI, LLMs, ChatGPT
- Different AI techniques, not only LLMs, with different potentials and applications.
- Machine learning, Deep learning, Reinforcement learning, NLP, Recommender Systems, etc.
- AI can solve any problem. AI knows everything. AI is magic. Every automation is AI. AI couldn't be controlled, etc

WHAT PROBLEMS COULD AI SOLVE IN CONSTRUCTION?



AI … MYTHS & MISCONCEPTIONS

We Have No Data!

We Don't have Enough Data!

It's Challenging to gather and prepare Data

AI … MYTHS & MISCONCEPTIONS

Data Quality is a Barrier

Our Data is not standardised

AI … MYTHS & MISCONCEPTIONS

AI cannot learn from historical projects …

Every construction project is unique.

Data Privacy and Confidentiality is an issue

AI … MYTHS & MISCONCEPTIONS

We are already using Risk assessment tools

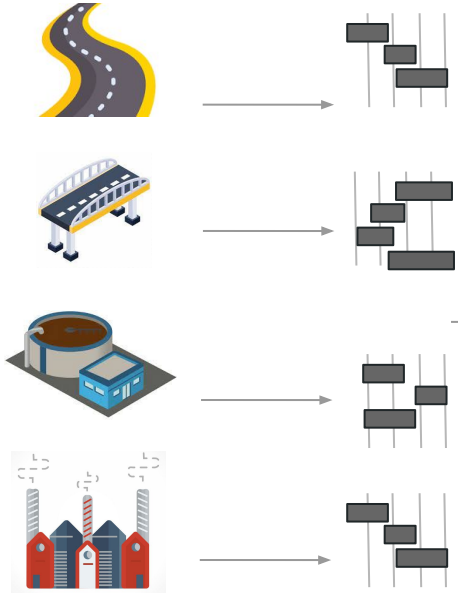
Why should we used AI… QSRA should be enough

AI … REALITIES

PAST PROJECTS

SCHEDULES

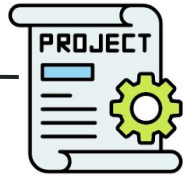
ACTIVITIES

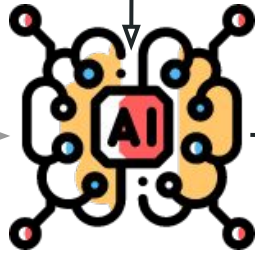


How long will the project take?

What might go wrong with it?

What can we do to reduce risk?



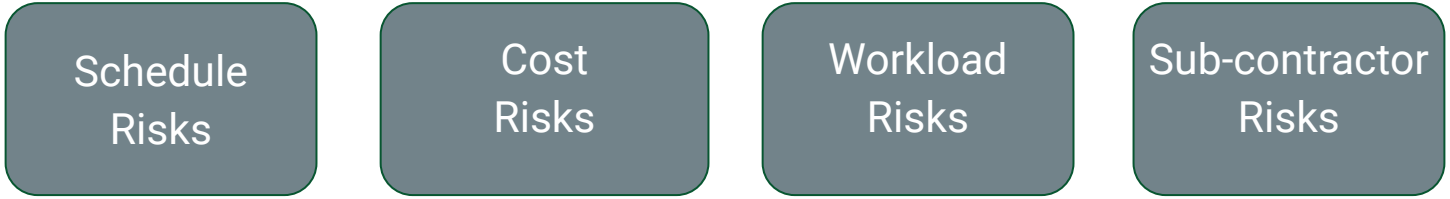


- End date predictions
- Risk predictions
- Recommend risk mitigation
- Assess changes impact

PREDICTIVE RISK MANAGEMENT

Proactively manage risks **before they become issues**.

- Use AI to find **unknown unknowns**.
- Identify **counter-intuitive** risks that would have been missed by your team or during traditional QSRA process.
- Analyse risks at portfolio, project and activity levels.
- Measure the risks and their impact on key project milestones.
- Get AI-led recommendation of Risk Mitigation Strategies and conduct scenario analysis to test strategies that give you the best chance of making the end date.



BID ASSISTANT

Submit a more competitive bid, win more work, and showcase to your client the added value of confidence in the outcome of the project.

Identify & Measure schedule risks.

Identify opportunities to save days based on data, not ideas.

Recommend mitigations.

Evaluate optimisation scenarios and their commercial impact.

Submit a more competitive bid.

POST INVESTMENT REVIEW

- AI-based post-mortem analysis of completed project information.
- Streamline lessons learning - What went wrong? What went well? Why?

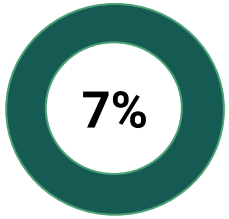
DEMONSTRATED VALUE

GLOBAL CONTRACTOR

- Sector: Data Centres
- Multi-billions project portfolio

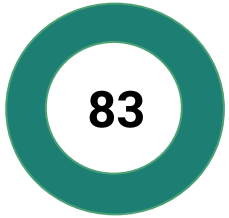
SMART PMO AI IMPLEMENTATION

- Predict end date and duration of projects and activities.
- Identified 70 high-risk activities across Permits, Design, Procurement, Construction, Commissioning, etc.
- Model different risk mitigation scenarios.



Cost saving via risk prediction and early mitigation

Reduction in Contingency budget via greater certainty underpinned with data



Days saving via schedule optimisation

Increase in Risk precision vs QSRA by using AI methods

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START SMALL WITH A VISION TO SCALE

- Start with a comprehensive AI strategy
  - Build AI to create real business value, not as a Nice-to-Have tool.
  - Assessment of needs. Prioritise areas in the construction process.
  - Involve different teams.
- Discuss and address barriers early
  - Trust barriers.
  - Reliability of the models will slow adoption.
  - Legal barriers.
  - Integration with existing systems.
- Iterative Improvement

HOW TO DE-RISK AI?

- Manage expectations! Don’t overestimate AI in the short term and underestimate it in the long term.
- Real-world test pre-implementation using scientifically approved methods.
- Continuous monitoring and evaluation of AI perfomance in live setting.
- Continuous improvement cycle. Monitor - Measure - Gather feedback - Update.
- Invest in Training and education.
- Support change management.

BUILD TRUSTED AI

AI solutions must be rigorously tested and monitored, ensuring **value assurance** through comprehensive pre-implementation **testing** and real-time operational **measurement**.

DOES AI REALLY WORK?

SEEING IS BELIEVING!

1 TEST

Make predictions using based on new Client unseen data.

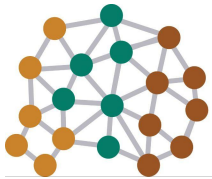
Compare our predictions vs the actual reality.

2 MEASURE

Collects data from live production environment

Measures the AI system performance and its impact on business KPIs.

Generate reports to stakeholders.



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CONTACT US FOR A DEMO!