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Building the Future – The Role of Artificial Intelligence (AI) in Construction Management in Ireland and the UK

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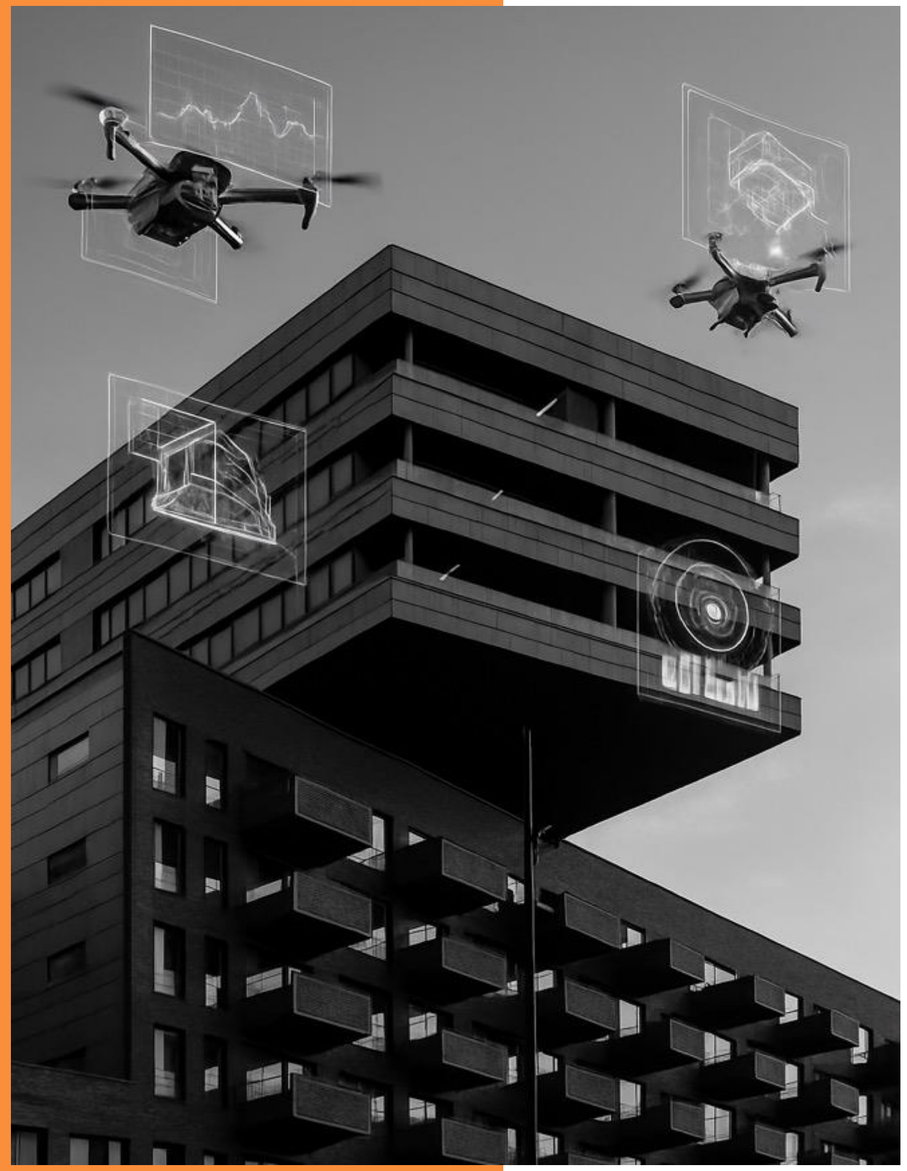
Research Background & Aim

Background

- AI improves planning, efficiency, resource allocation, and real-time decision-making.
- Enables automation, predictive analytics and monitoring for safer, faster delivery.

Aim

- Analyse practical AI adoption in Ireland & the UK.
- Identify industry challenges and opportunities based on real project use.
- Examine impacts on project efficiency, planning accuracy, productivity, and safety.



Why AI Matters

Industry Drivers

- Labour shortages and sustainability targets accelerating digital adoption.
- AI supports better scheduling, cost control, and reduction of delays and waste.
- Predictive decision-making improves feasibility and accuracy.

Safety Benefits

- Wearables, computer vision and PPE monitoring help prevent accidents.
- AI identifies unsafe behaviours and hazards before incidents occur.
- Moves safety from reactive response → proactive prevention.

Methodology (Mixed Methods)

Research Design

- Sequential mixed-methods approach.
- Literature review → interviews → questionnaire survey.
- Combines real-world experience with measurable industry trends.

Data Sources

- Interviews with Project Manager, Graduate Engineer, BIM Coordinator.
- Survey responses analysed using descriptive statistics and thematic coding.
- Ensures qualitative depth + quantitative reach.

Survey Sample & Demographics

Respondent Locations

- 52 total responses.
- 17 → Ireland
- 15 → United Kingdom
- 10 → Canada
- 10 → other European countries

Participant Profiles

- Included site engineers, quantity surveyors, ai experts and graduates.
- Range of experience levels reflects diverse insights into AI awareness & usage.
- Provides a broad understanding of adoption across different project roles.

Key Findings: Benefits

Efficiency & Productivity

- Automates routine tasks & optimises scheduling.
- Predictive analytics improves early decisions and feasibility.
- Satellite imaging & BIM-integrated AI reduce errors and material waste.

Industry Perception

- Survey: majority believe AI improves project efficiency and sustainability.
- Interviewees expect AI to expand and strengthen digital workflows.
- Seen as a competitive advantage for construction firms.

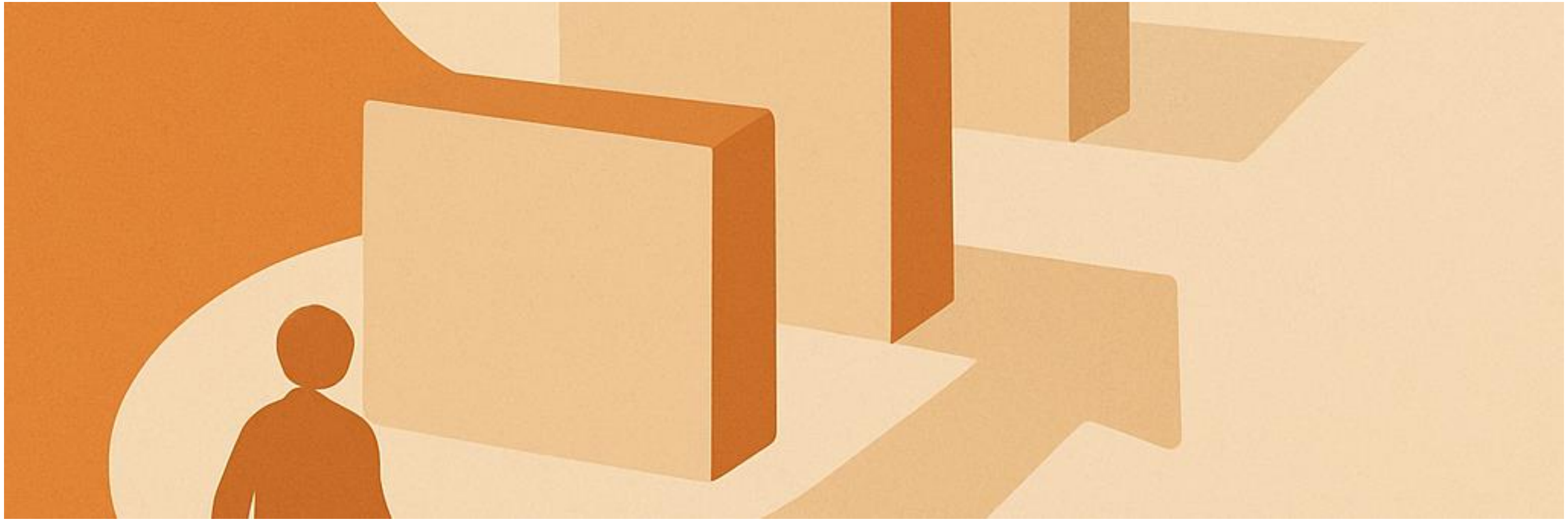
Key Findings: Safety Improvements

Safety Applications

- PPE monitoring, access control using facial recognition.
- Computer vision detects hazards in real time.
- Wearables track worker movement and environmental risk.

Impact

- Predictive analytics identifies recurring risks and prevents incidents.
- AI supports proactive safety management instead of reactive response.
- Interviewees highlight reduced human error and improved compliance.



Key Findings: Challenges & Barriers

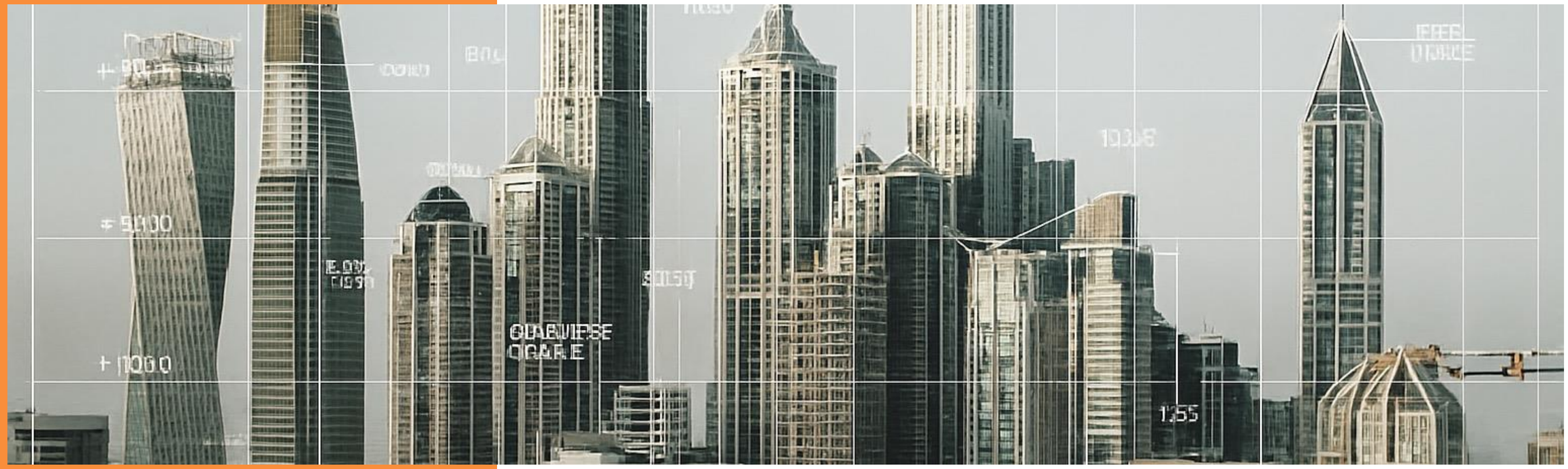
Workforce & Skills

- Graduates lack practical AI skills and training.
- Need for academic–industry collaboration to update education.
- Limited CPD opportunities slow adoption.

Regulation & Cost

- Lack of clear regulation for ethical use and data security.
- Data ownership & cybersecurity are major concerns.
- High implementation costs limit adoption, especially for SMEs.

Conclusion & Takeaways



Conclusions
AI is already improving construction efficiency, planning accuracy, and on-site safety.
Predictive analytics, automation, and digital monitoring reduce delays, waste, and incidents.
The industry has a positive outlook on AI and views it as a driver of innovation.

What Needs to Happen
Upskilling and education must improve to close the AI skills gap.
Clear regulation and data security frameworks are critical for safe adoption.
Support for SMEs is needed so AI benefits the entire industry, not only large firms.

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Thank you