Digital Fire Strategies:
Retaining Principles of Safety Design Throughout the Lifecycle of the Building

An **intersec** co-founded initiative

CROWNE PLAZA كراون بلازا

Safety Design in Buildings

With the Participation of The Public Authority for Civil Defense and Ambulance:

Muscat
September 5, 2018, Crowne Plaza Muscat

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Presenter

John Noone, Co-founder – Fire Engineering, Joule Group

John is the co-founder of Joule Group, a boutique Fire Engineering Practice based in Dubai. A Chartered Fire Safety Engineer he holds a BSc Hons in Fire Safety Engineering.

John has gained a wide range of experience in fire engineering in the Middle East, Africa and Europe.

He applies his expertise primarily in fire safety design, on-site implementation and handover of Aviation, Assembly and transportation projects across the built environment.

John is a visiting lecturer at Trinity College Dublin on the fundamentals of fire safety science and fire dynamics.

John's passion is for advancing the field of fire engineering in its application into the design and operation of the built environment. He represents Joule Group and the industry in promoting this message on fire safety at targeted fire safety seminars and conferences.

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Learning Objectives

1. *How digital is changing our industry – transformational*

2. *Industry advancement through digital methods*

3. *BIM Plugins / Automating Core work processes*

4. *Integrating Fire Safety Engineering Tools*

5. *Animated Fire Strategies*

6. *Data driven mapping*

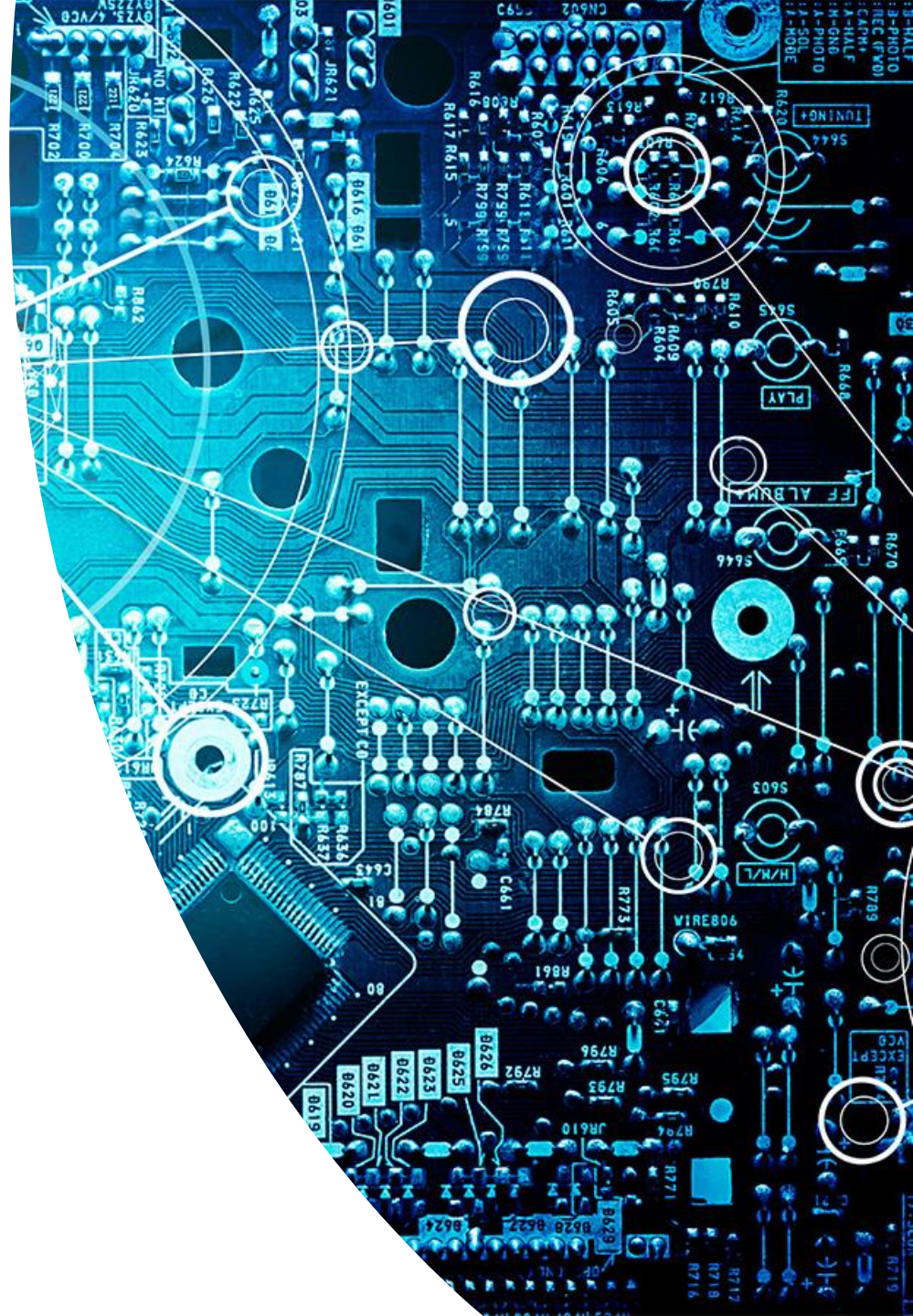JOULE GROUP

Transformational Change
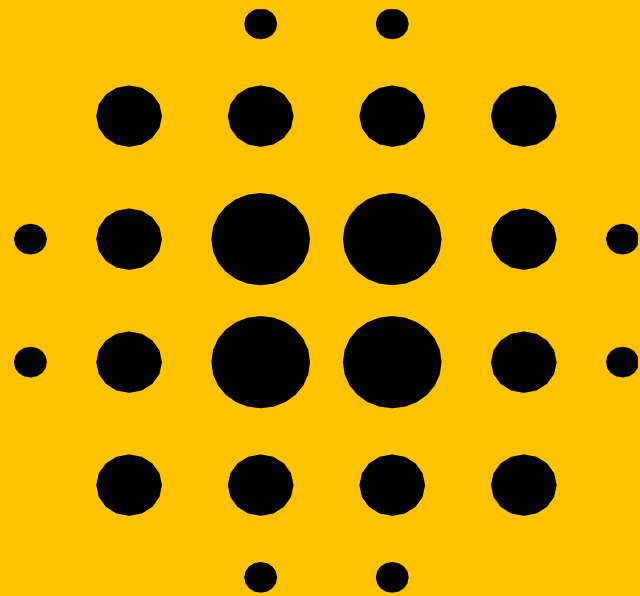
Exponential Thinking

"Technology has advanced more in the last 30 years than it has in the previous two thousand. The exponential increase in advancement will only continue"
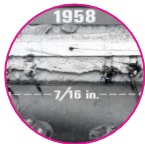
Neils Bohr - Physicist

1885 – 1962

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Moore's Law:

Price performance
of computers doubles
every 18 – 24 months

– Gordon Moore

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Integrated circuits

1958:
2 transistors

1971:
Intel 4004
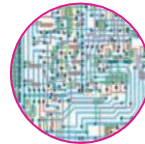
2012:
Nvidia's GPU

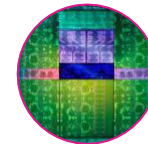2 transistors   2,300 transistors   7.1 billion transistors
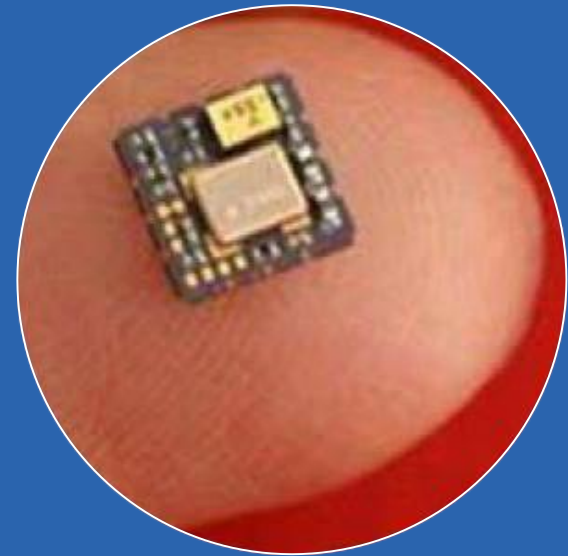
10K (faster) & 10M (cheaper) →

100 billion-fold improvement (40 years)

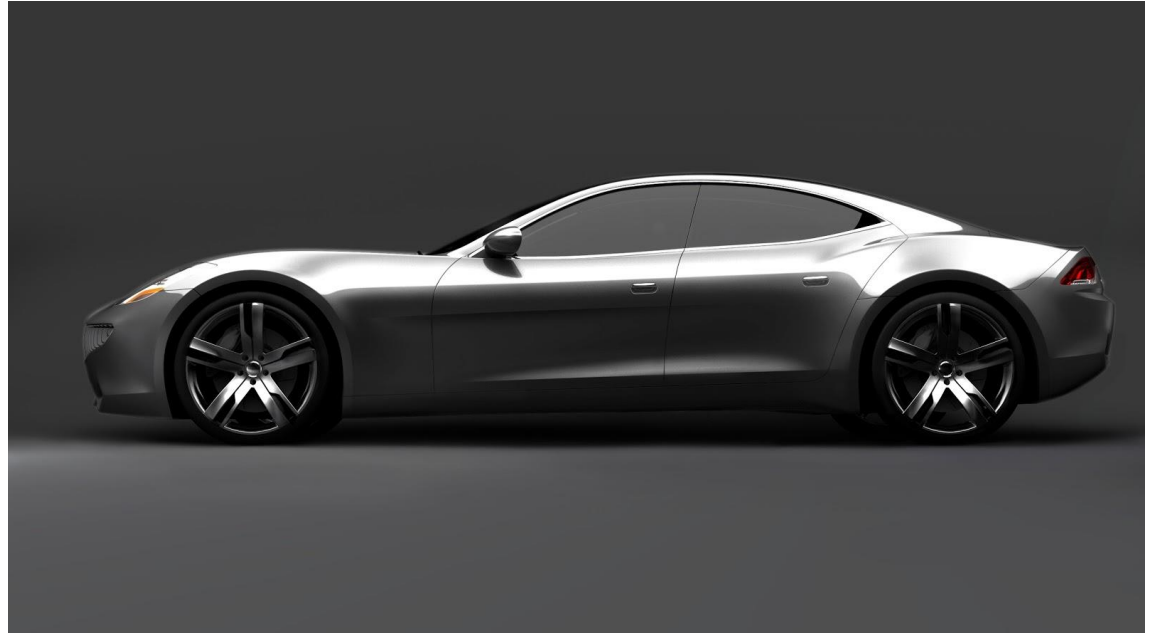@singularityiu

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Exponential growth

1st commercial GPS receiver in 1981
Weight: 53 lbs; Cost: $119,900

Single-chip GPS receiver in 2010
<$5 each

Disruption

Automotive Industry

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Disruption - Engineering Industry
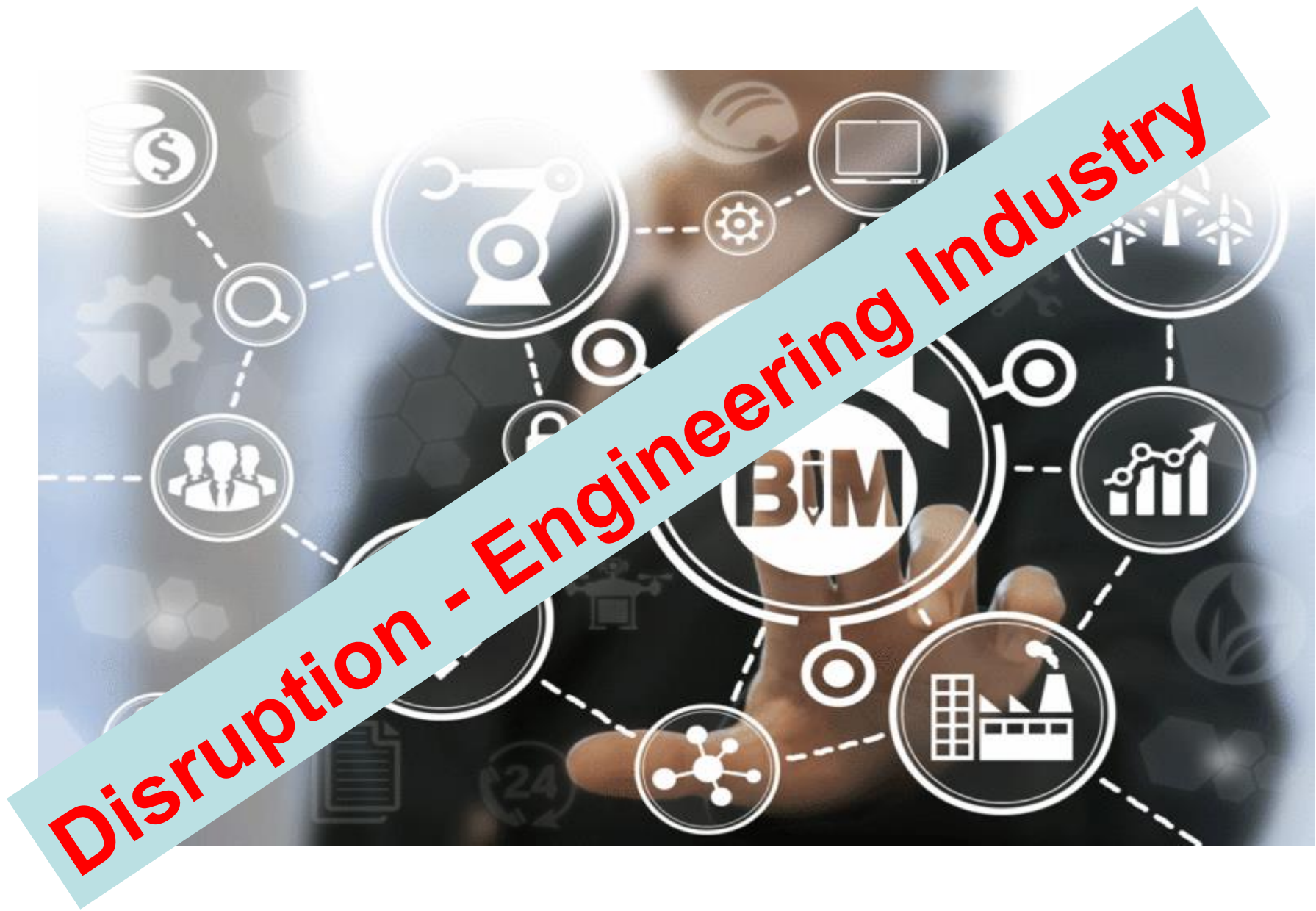
Changes in Industry Landscape

Advancements in Technology have significantly impacted the construction industry

- *Cloud & Mobile Applications facilitate Stakeholder Collaboration and Communication*

- *BIM (Building Information Modelling) has resulted in the lines between digital and physical being much less defined.*

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Changes in Industry Landscape

- *Virtual Reality – Creating the ability to provide fully interactive and immersive experiences.*

- *Augmented Reality – Using Tablet or Mobile Devices, Interacting with Real World Components Through a Screen.*

- *Predictive Data Analytics – Analyzing Risk Factors based on historical data*

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Opportunities

It is time such forward thinking was implemented in the Fire Engineering Sector of the Construction industry.

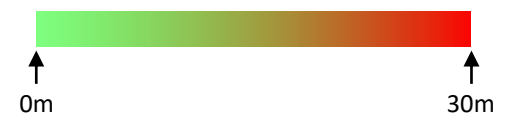*We now have the opportunity to modernize our approaches to how:*

- *Information is Collected;*

- *Data is Organized & Analyzed;*

- *Strategies are Presented;*

- *Buildings are Monitored Through Their Life Cycle*

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Automating our core work processes (travel distance assessments, occupancy loading) through BIM plug in's

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With automation we can focus on better outcomes to improve the quality of our advice and the solutions we deliver

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Legend:
- Business
- Assembly
- Storage
- Plant/Industrial
- Stair
- Circulation
- Riser

Automatic Occupancy Calculation and Visualisation

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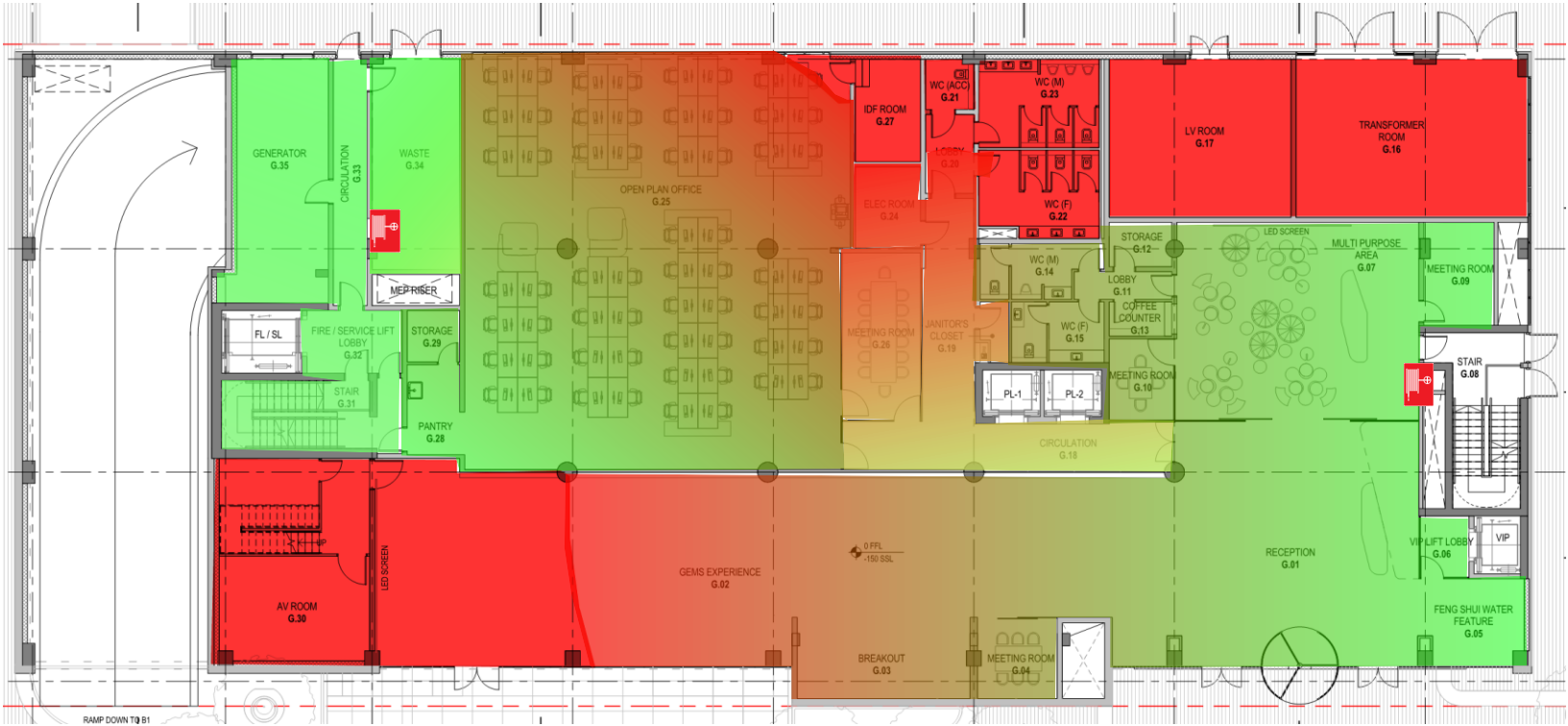
Distance Heat Mapping - Hose reels

0m   30m

Critical thinking and alternative fire engineering design will become more important (automation to cover core fire strategy code compliance)

Integration of tools such as evacuation, radiation and smoke control software

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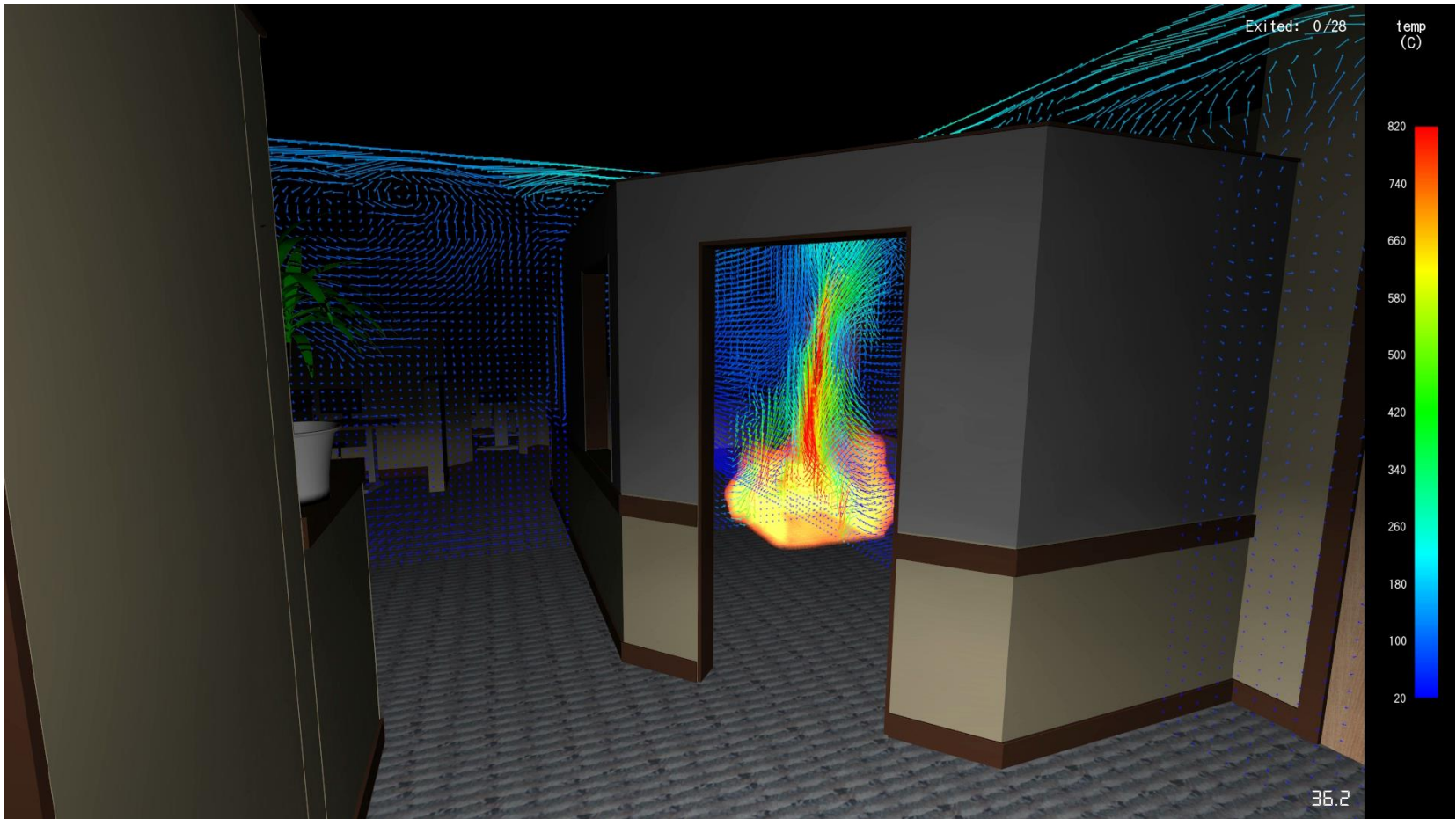
Evacuation / CFD Model Visualisation (Courtesy of Thunderhead Engineering)

Evacuation / CFD Model Visualisation (Courtesy of Thunderhead Engineering)

Digital Fire Strategies

Animation

Stronger visuals and Animation

- Consolidated Summary to aid Civil Defence approvals
- End user operations
- Training & Trials
- Fire Safety Management
- Effective Record of Fire Safety Strategy

Augmented reality to test designs (i.e. evacuation route planning and placement of exit signs), present to Civil Defence for approvals, for operational readiness trials etc.

Data Analysis

Utilizing data gathered over multiple project sites, it would be possible to:

- *Provide Real time Assessments of Building Performance During Operation.*

- *Allow property owners to manage risk more easily.*

- *Optimizing risk assessments and inspection works, resulting in cost saving*

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Data Analysis

Ability to apply these principles to give outputs related to building types across multiple regions and sites :

Concluding Remarks

- Embrace the technologies that are available

- Use these tools for better design and co-ordination

- Use these tools for better illustration and record of the Fire Strategy Design

- Automation – efficiency and cost effectiveness

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Thank You

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