



ANNEX **81**

EBC



Energy in Building and
Communities Programme

Scaling Adoption of Automated Operational Intelligence for Energy Productivity in Smart Buildings

Findings from the IEA Annex 81 'Data
Driven Smart Buildings' and 'Brains for
Buildings' (B4B) Projects

Panel #1

Digital Infrastructure – barriers, cost, skills gaps

Moderator:

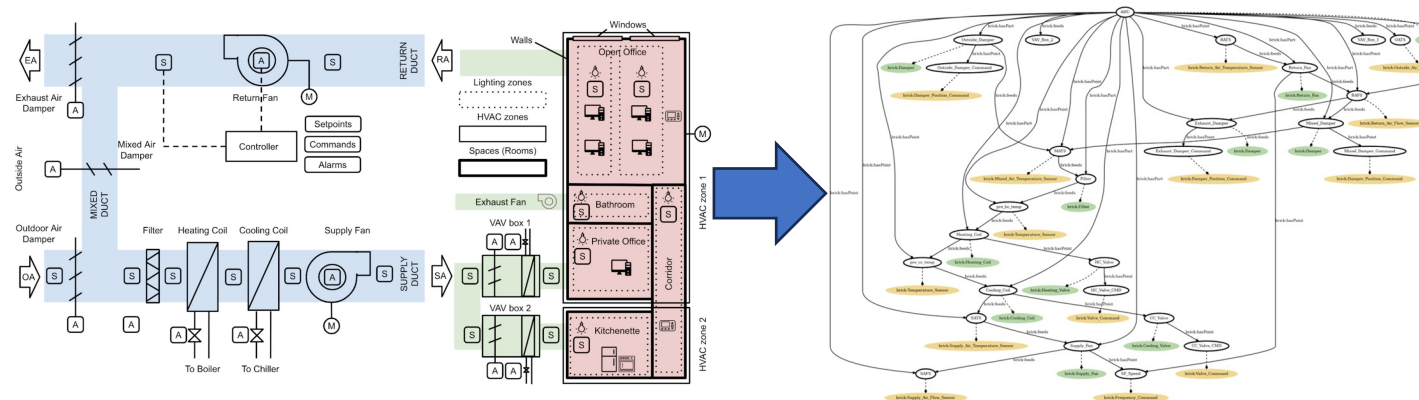
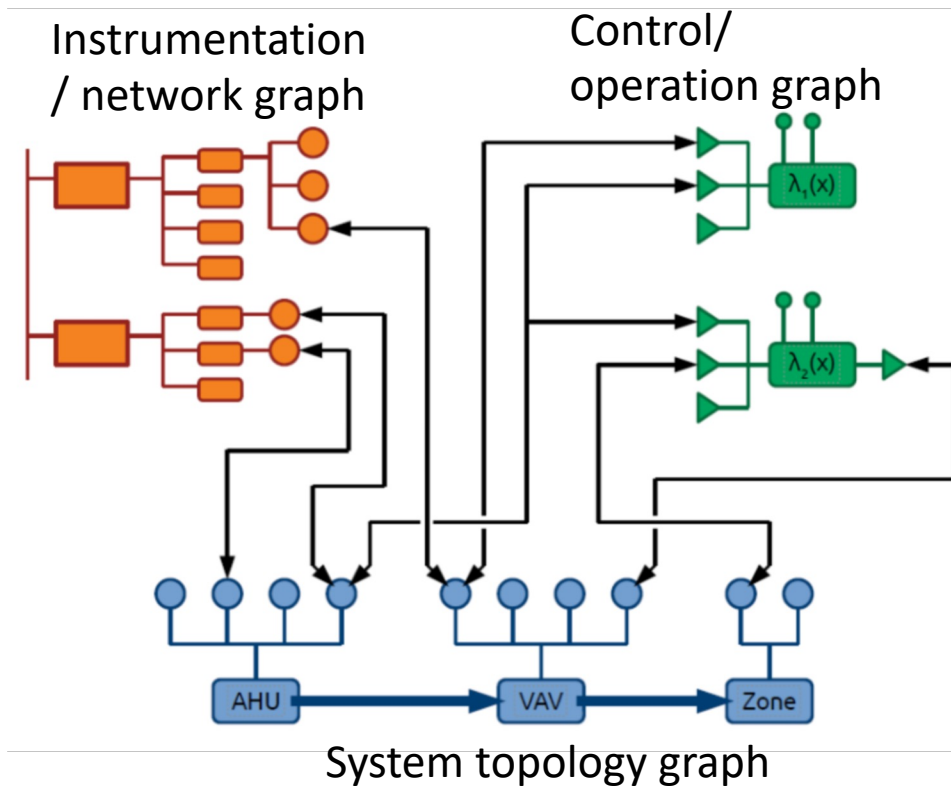
Pieter Pauwels

(Eindhoven University of Technology)

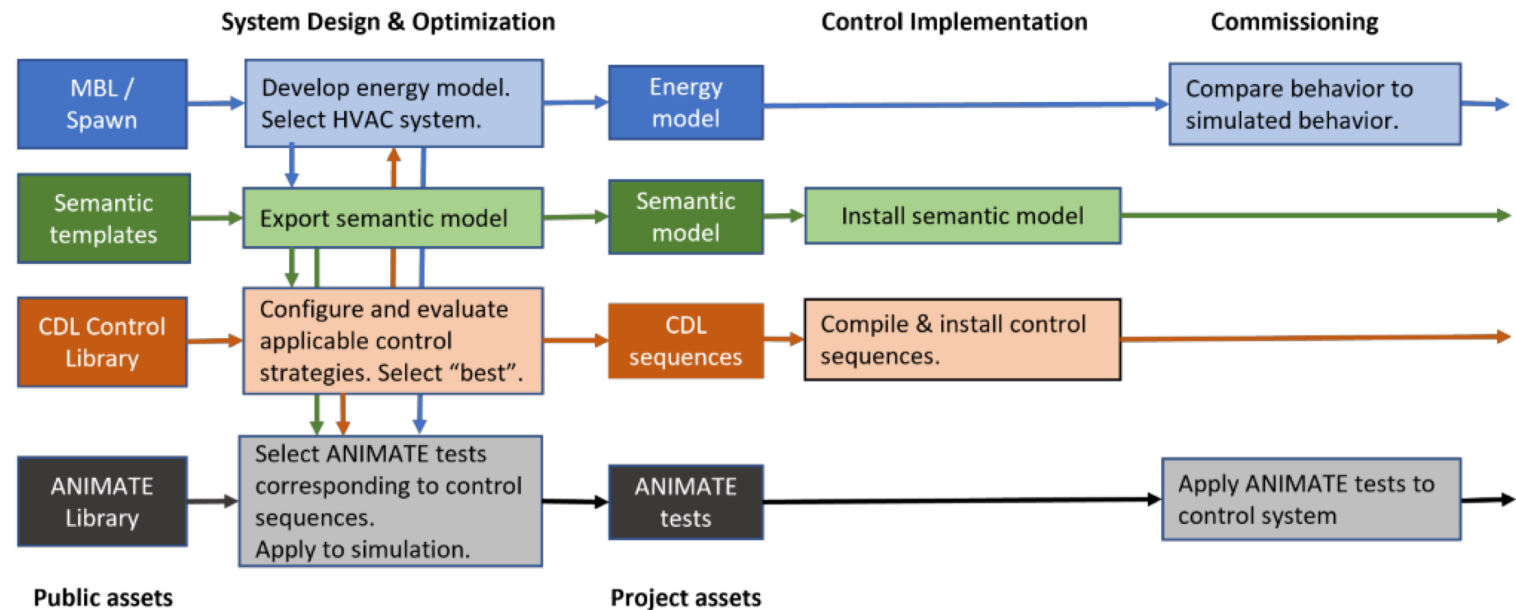
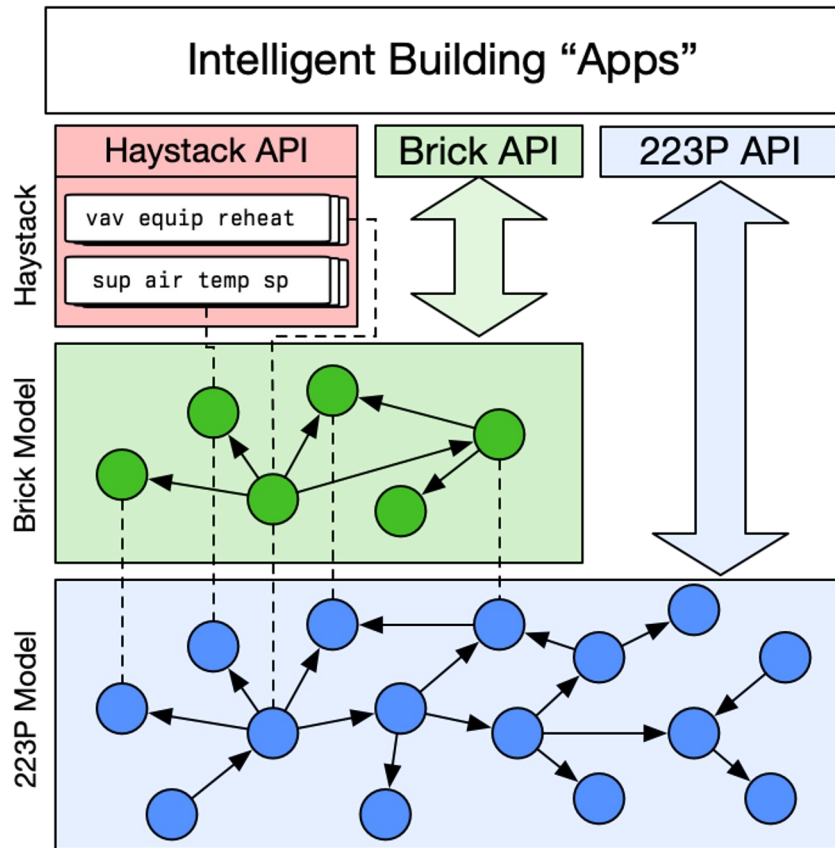
Panellist:
Gabe Fierro
(Colorado School of Mines/NREL)

Digital Standardization is Coming

- ASHRAE 223P (*Semantic Models of Buildings*)
- ASHRAE 231P (*Control Description Language*)
- Foundations of a **single representation** covering system makeup, network, and controls

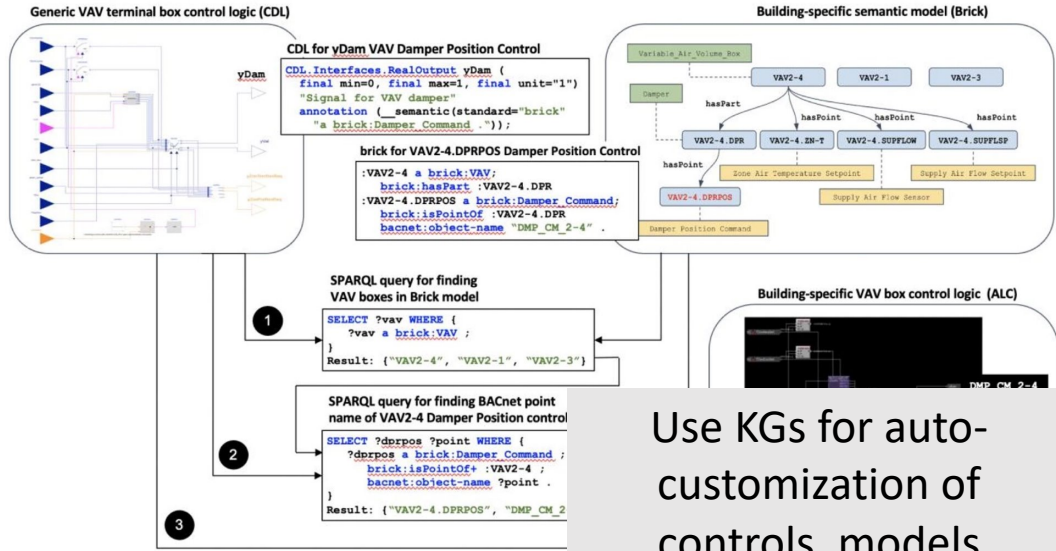


Buildings Are Looking More Like Computers

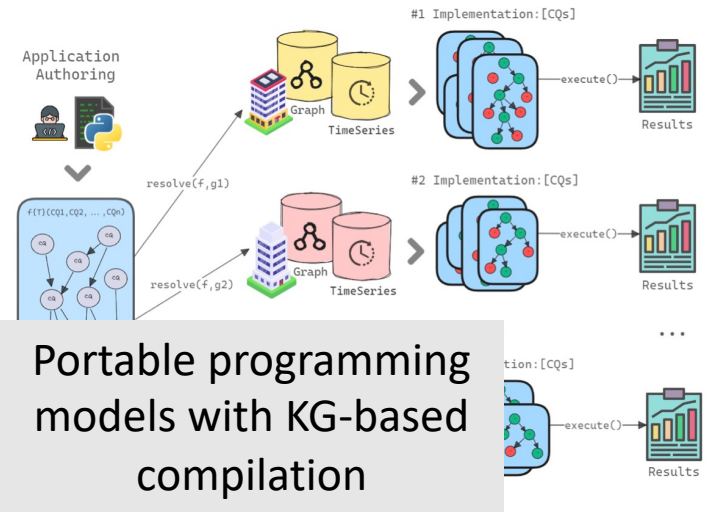


- Abstract away more details as you move up the “stack”
 - Similar to operating systems, networks, programming languages
- Standardization efforts and complementary research are enabling formalized, verifiable design and delivery of smart building applications

Knowledge Graphs for Digital Applications

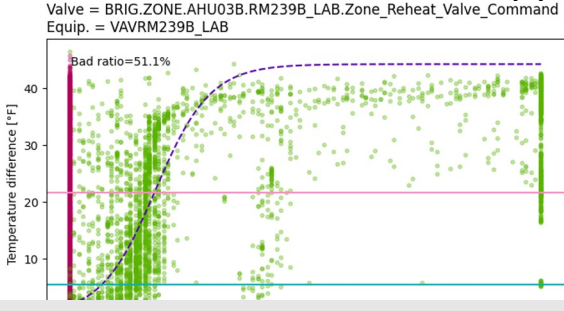


Use KGs for auto-customization of controls, models

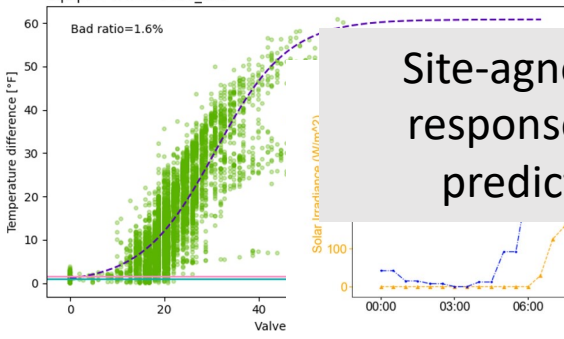


Portable programming models with KG-based compilation

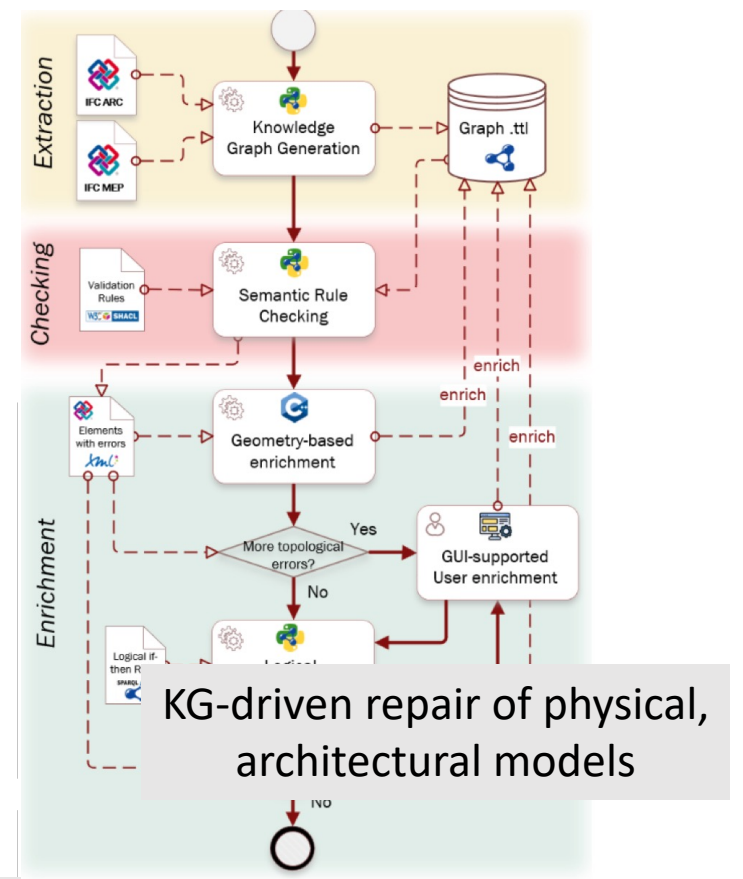
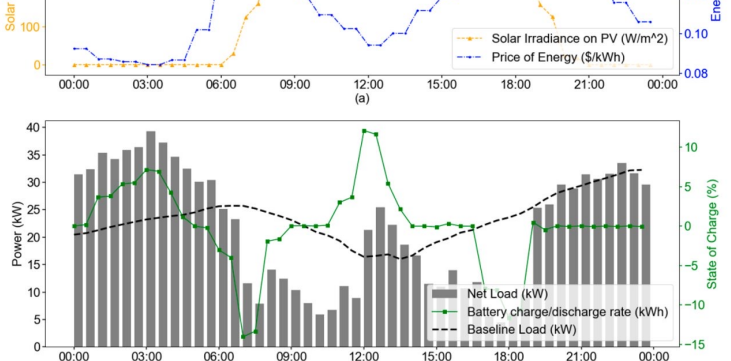
Broken Valve Detection App



Data-driven anomaly/ fault detection and diagnosis



Site-agnostic demand response and model-predictive control

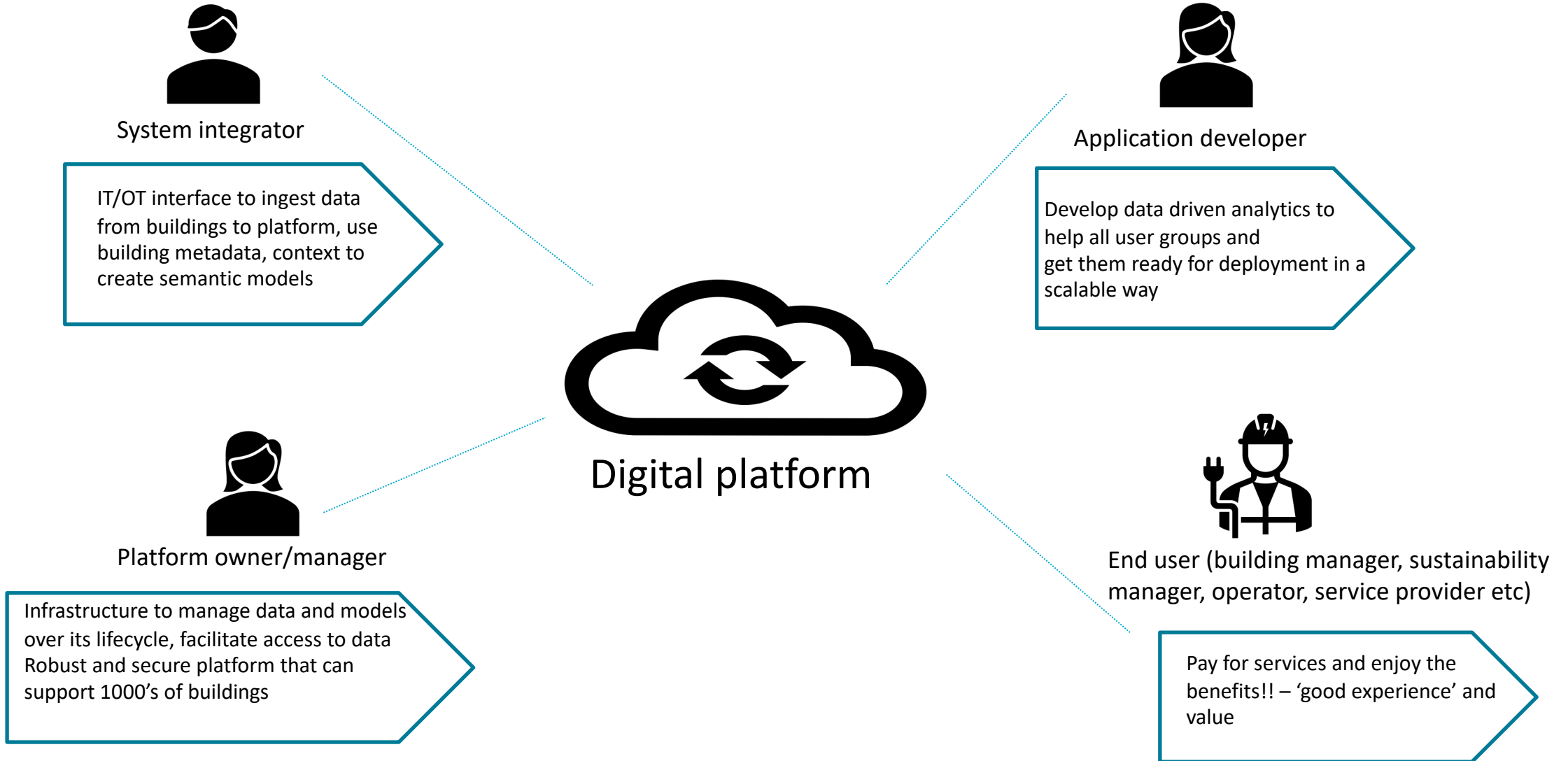


Proposition: No more "gurus"

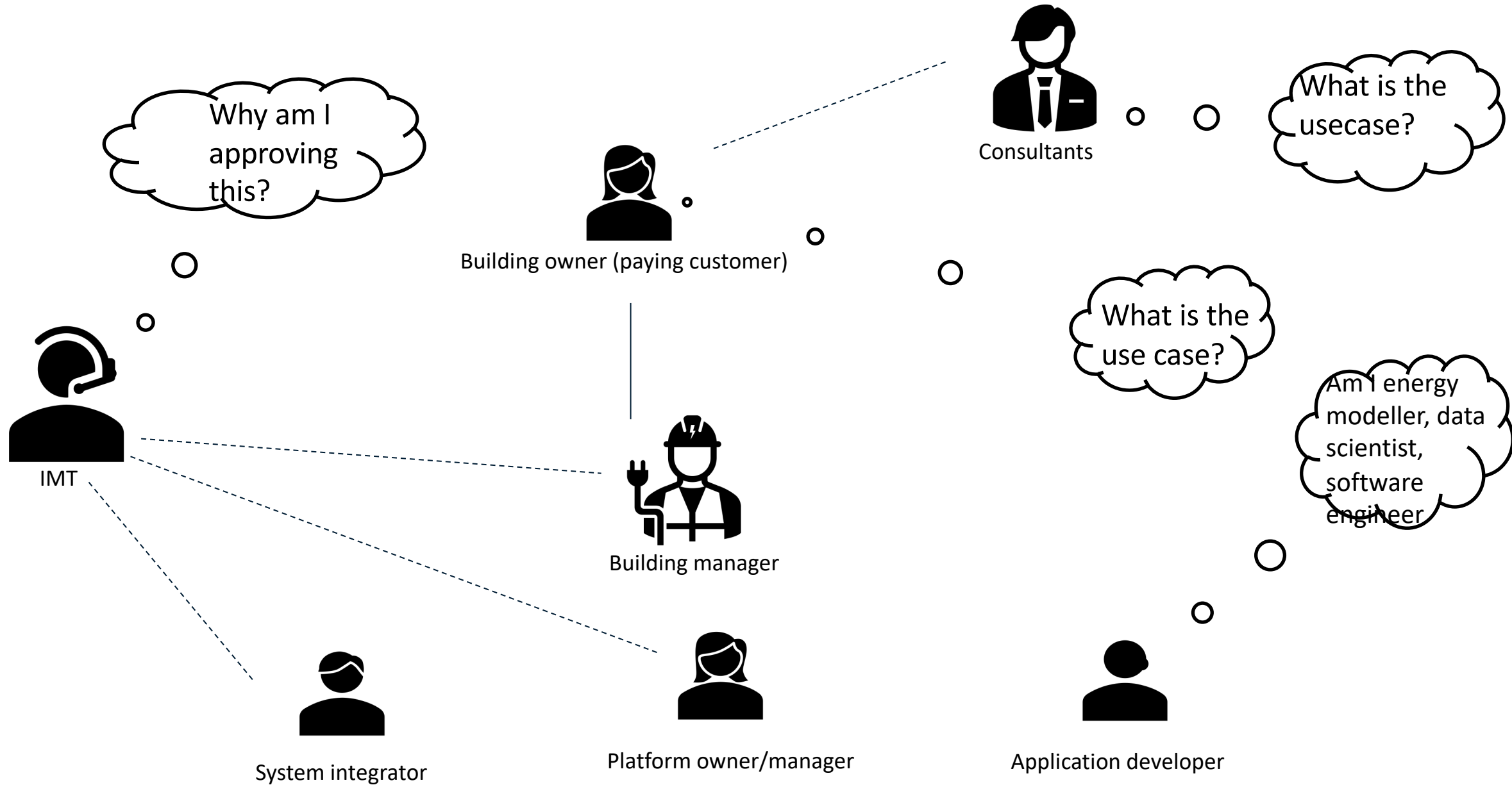
- Fully commoditized digital building solutions
 - Construct SOTA controls, AFDD, etc platforms from off-the-shelf components
- "Smart building" workforce will be software engineers, not domain specialists
- Knowledge graphs and other "expert knowledge" systems will enable greater trust in emerging Generative AI technologies

Panellist:
Subbu Sethuvenkatraman
(CSIRO)

Delivering smart building services in a scalable way



Delivering smart building services in a scalable way



Delivering smart building services in a scalable way



Building owner (paying customer)



Consultants



IMT



Application developer



Building manager



Platform operator



System integrator

- New skills, new roles, new expectations
- Taking all stakeholders along the journey is a critical need for scalability !!

Panelist:
Elena Chochanova
(TNO)

B4B/IEA Annex 81 online symposium

PANEL: Digital Infrastructure – barriers, cost, skills
gaps

E.V. Chochanova | TNO

Panel Statement: **Data hoarding can hinder digital transformation**

Data hoarding [dey-tuh hawr-ding]

noun

the practice of collecting and storing large amounts of digital information, often more than is necessary or useful.

Why do organizations hoard data?

- FOMO
- Archiving
- Poor data hygiene

IBM estimates that roughly 90% of sensor data never gets used.

According to Datamation the storage environments of EMEA organizations consist of 54% dark data, 32% redundant, obsolete and trivial data and 14% business-critical data.

Negative effects of data hoarding



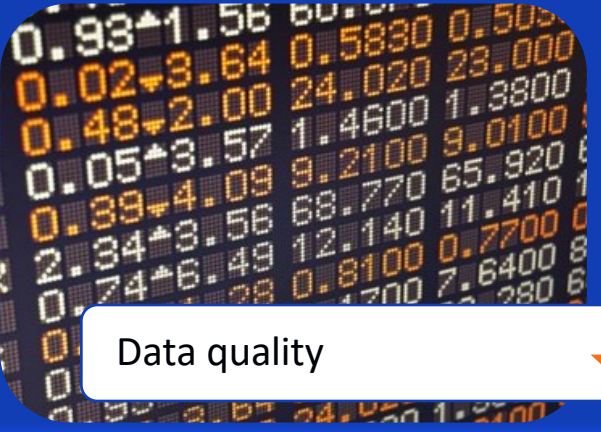
Data security




GDPR compliance



Oversight and control



Data quality



Environmental impact



Recommendations for better data management

Top-down reasoning

Why collect data? Align with the AM goals and vision.

Data governance

Regain data control and oversight

Collect with purpose

Ensure compliance with GDPR and data security standards

Practice data hygiene

Purge unnecessary data and applications

Focus on data quality instead of quantity

Insights can only be created using structured quality data.

