



Blockchain Enabled Building Information Modelling (BIM) for Sustainable Facilities Management

**33rd IPMA World Congress
Cape Town, South Africa
27/11/2024 – 29/11/2024
HOPE - People, Purpose, and Performance**

**Luke Desmond
Dr. Mohamed Salama**

Introduction

- **Student**

- Luke Desmond, SKEMA Business School, Lille, France
- Academic History
 - University of South Australia
 - Masters in Project Management
 - University of New South Wales @ Australian Defense Force Academy
 - Masters in System Engineering
 - Masters in Cyber Security Operations
 - Masters in Decision Analytics
- Professional Role
 - Program Director at Cisco Systems, USA
 - Lead complex programs in telecommunications sector



- **Academic Advisor**

- Professor Mohamed Salama,
- Applied Science University, Manama, Bahrain



Thesis Introduction

- **Background**
 - Doctorate in Business Administration at SKEMA Business School (France)
 - Phase 1 is studying Building Information Modelling (BIM) systems & Blockchain
 - Focus on transition from Architecture/Engineering/Construction to Facilities Management
 - Phase 2 (post doctorate) is focused on Sustainability & Energy Management
- **Practical Contribution**
 - A working model integrating BIM & Blockchain
- **Academic Contribution**
 - Link various academic theories including Construction Management, Facilities Management, and Information Management to develop a novel academic contribution.
 - Develop a working BIM and blockchain model to test specific use cases for academic studies.

Conference Proceedings

- Systematic Literature Review (2022)
 - International Conference on Leadership & Management of Projects in the digital age (Bahrain)
- Integration of Emerging Technology for Sustainability Assurance (2023)
 - IEEE Conference on AI, Blockchain and Internet of Things (USA)
- Integration of Cyber Physical Systems and Data Science into the Built Environment Lifecycle (2024)
 - International Conference on Information & Communication Technology (United Kingdom)



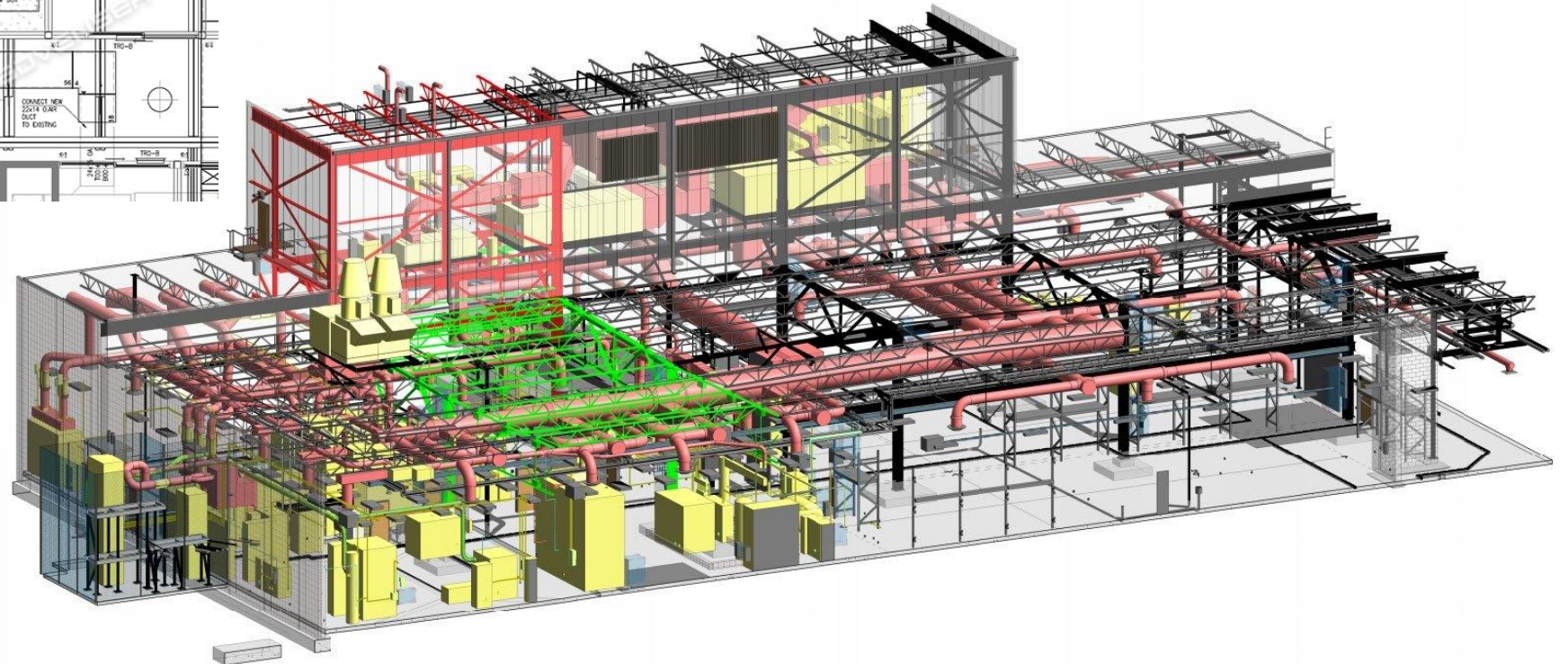
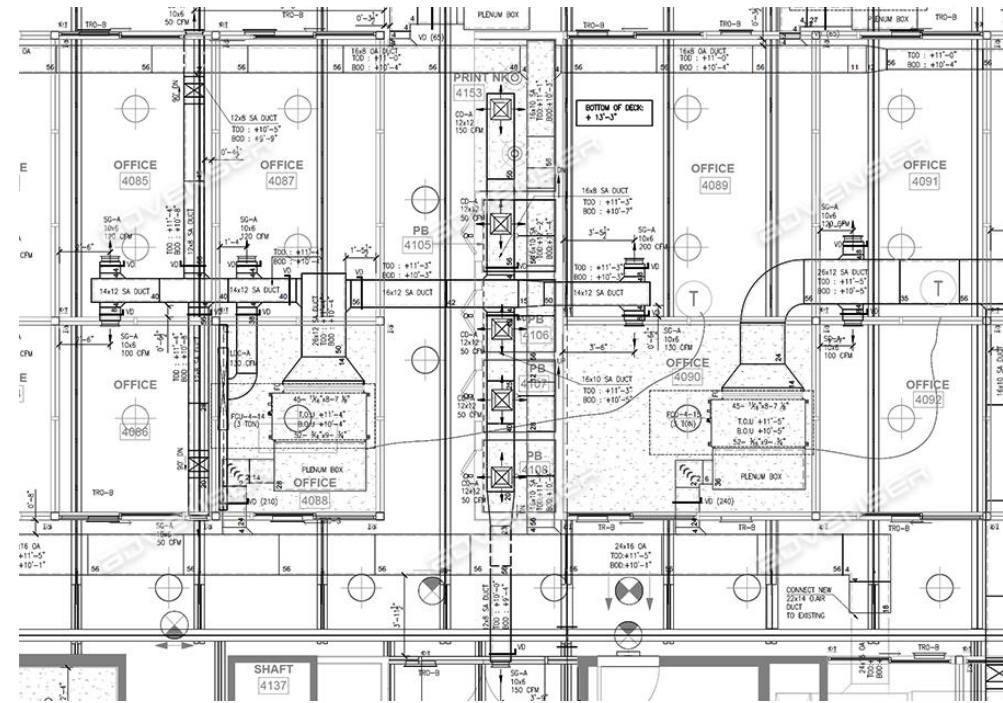
Environmental Impact of the Built Environment

‘The built environment is the dominant source of energy consumption and greenhouse gas emissions, accountable for 62% of final energy use and 55% of greenhouse gas emissions’

Anderson, Wulfhorst & Lang, 2015



BIM Definition



Qualitative Research – BIM Adoption and Sustainability

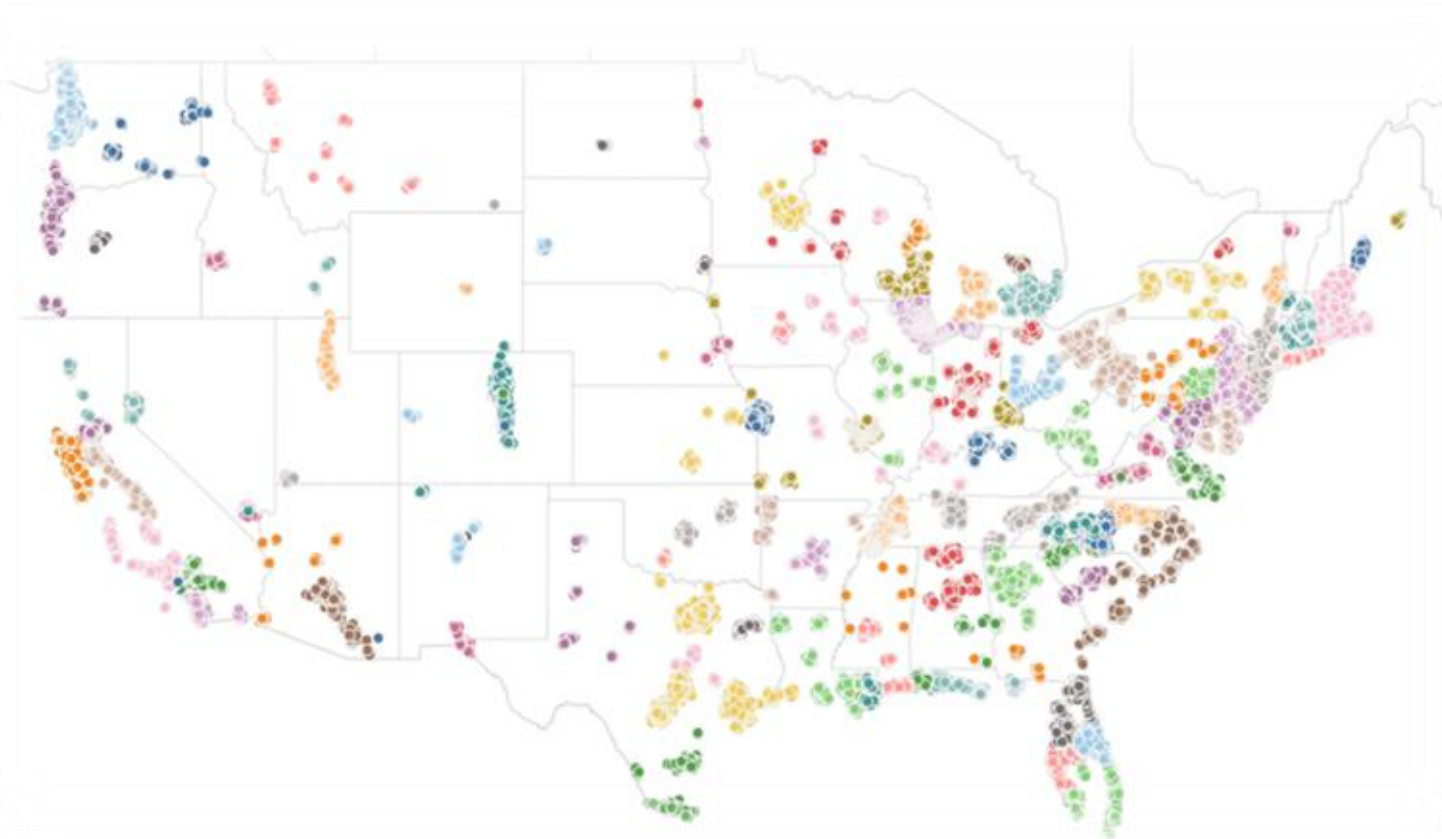


**US School District
30,000 Students & Staff**

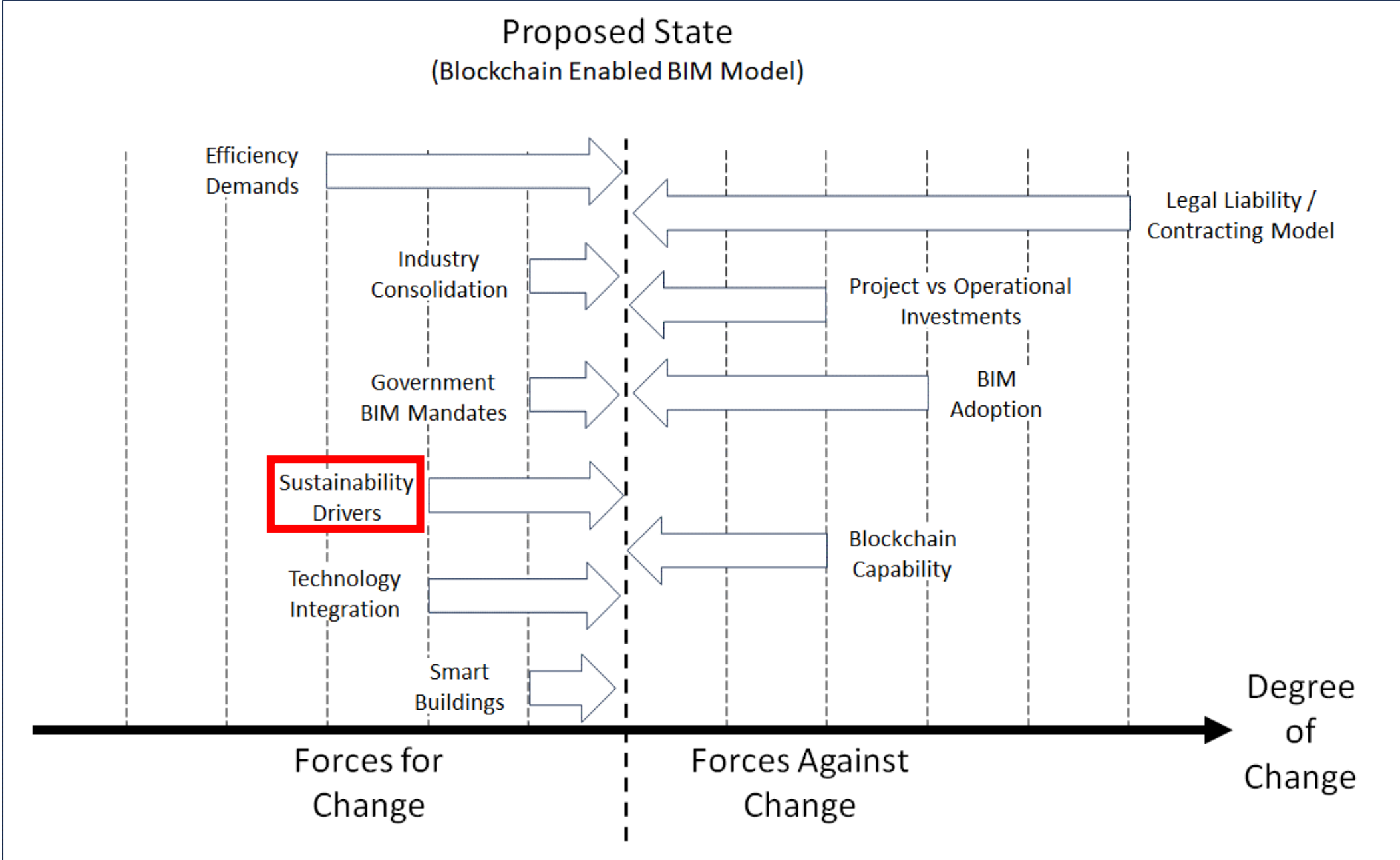
Not exploiting BIM data

Case Study Research – BIM Adoption and Sustainability

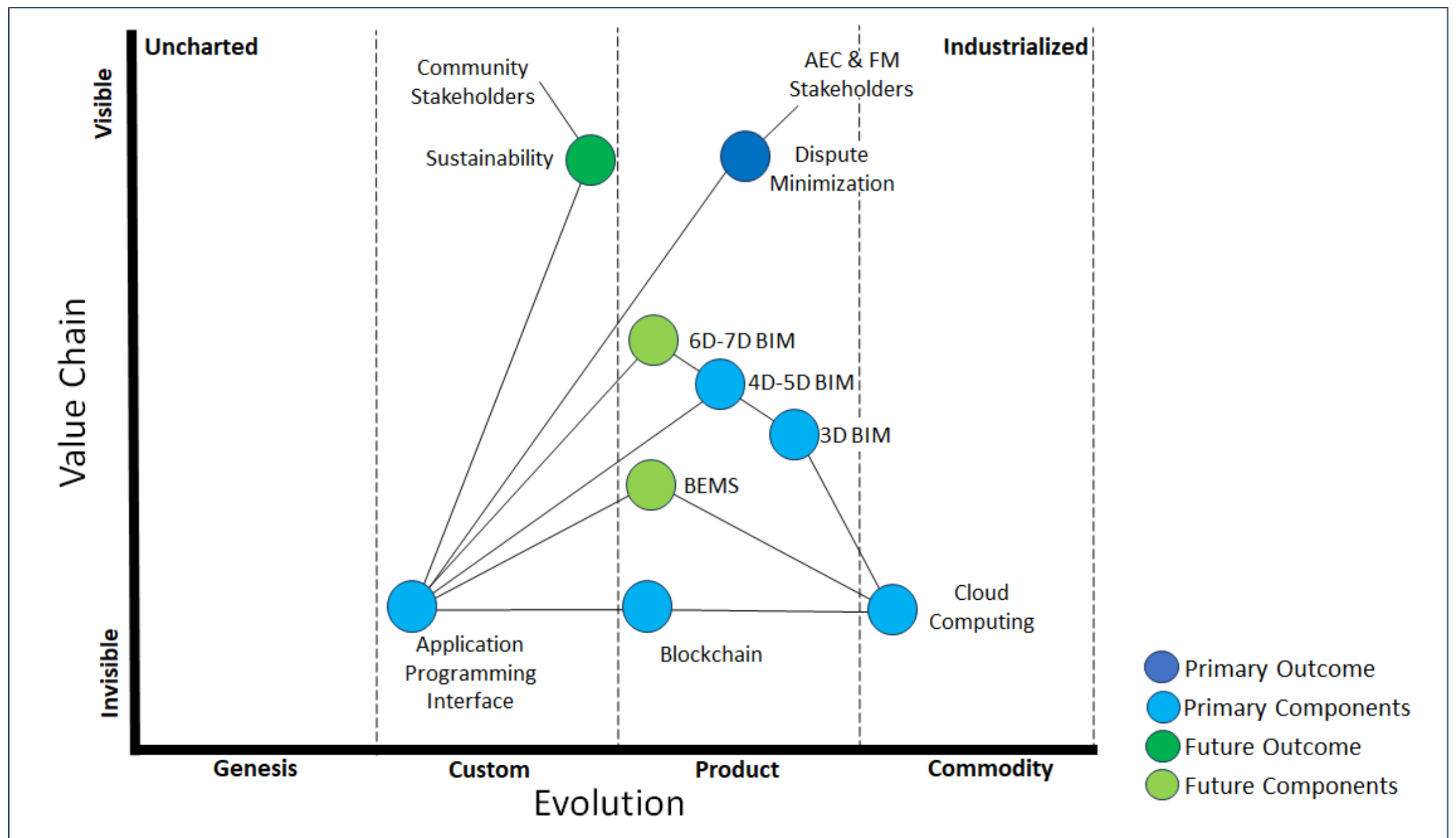
- **National Facility Operator**
 - 15,000+ facilities across the USA
 - Access to C-Level executives
 - Researcher embedded on site for 2 years on an adjacent program of work
 - Most Facilities Management and Sustainability work done in spreadsheets



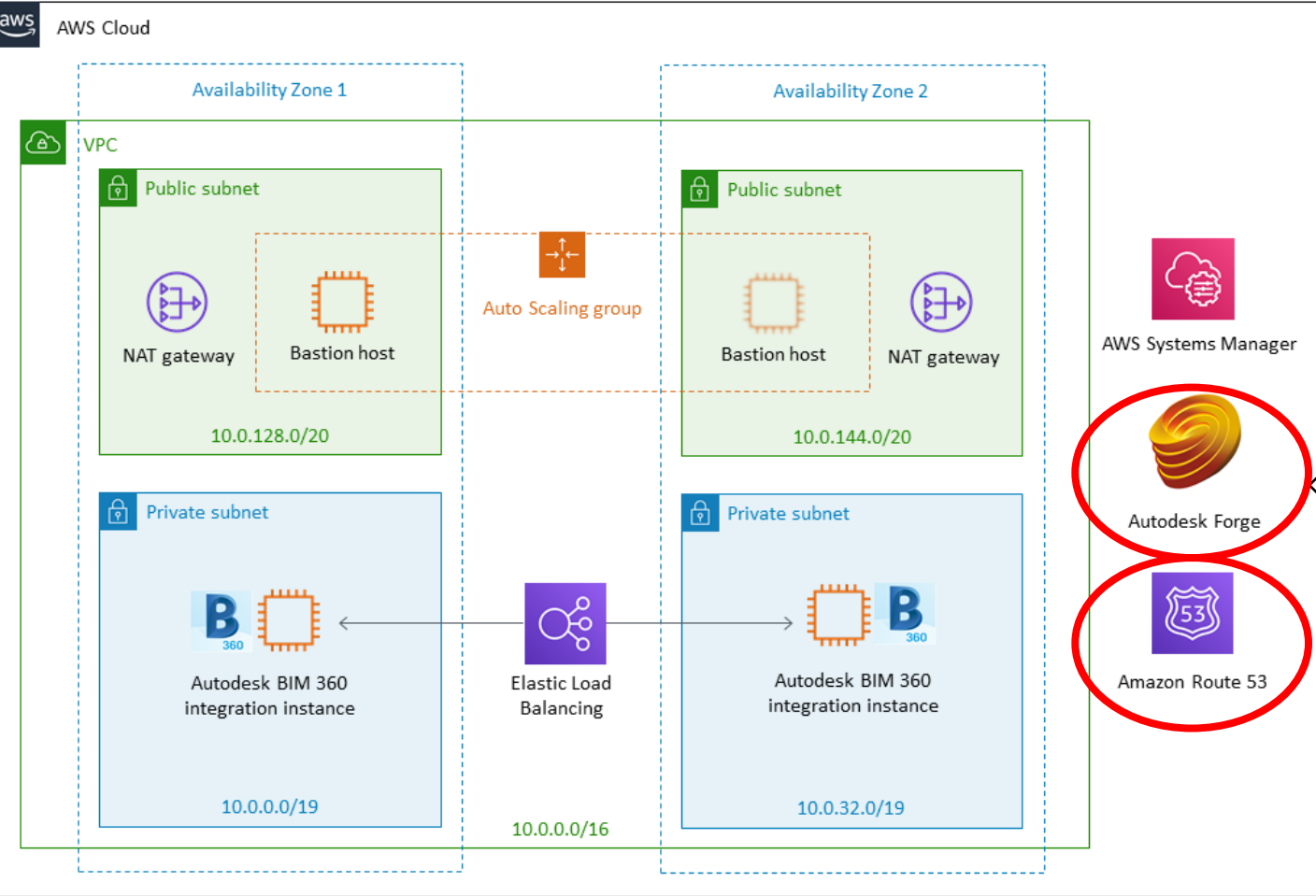
Data Analysis - Implementation Challenges



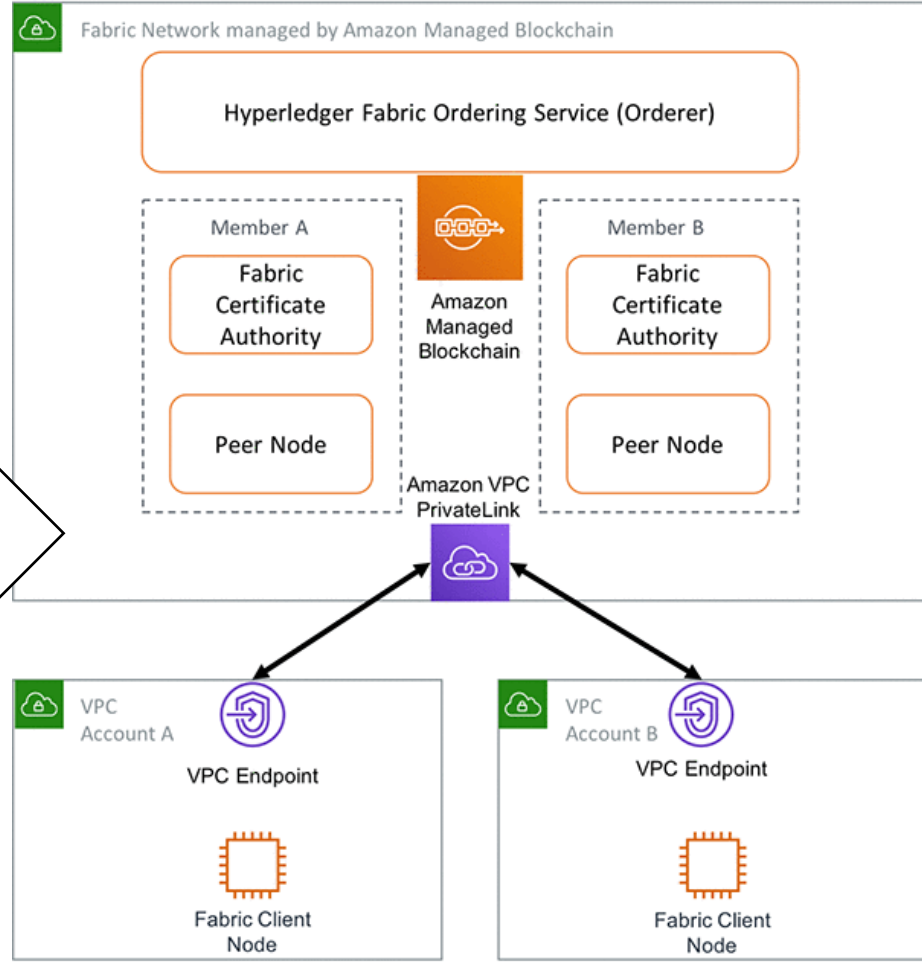
Wardley Map



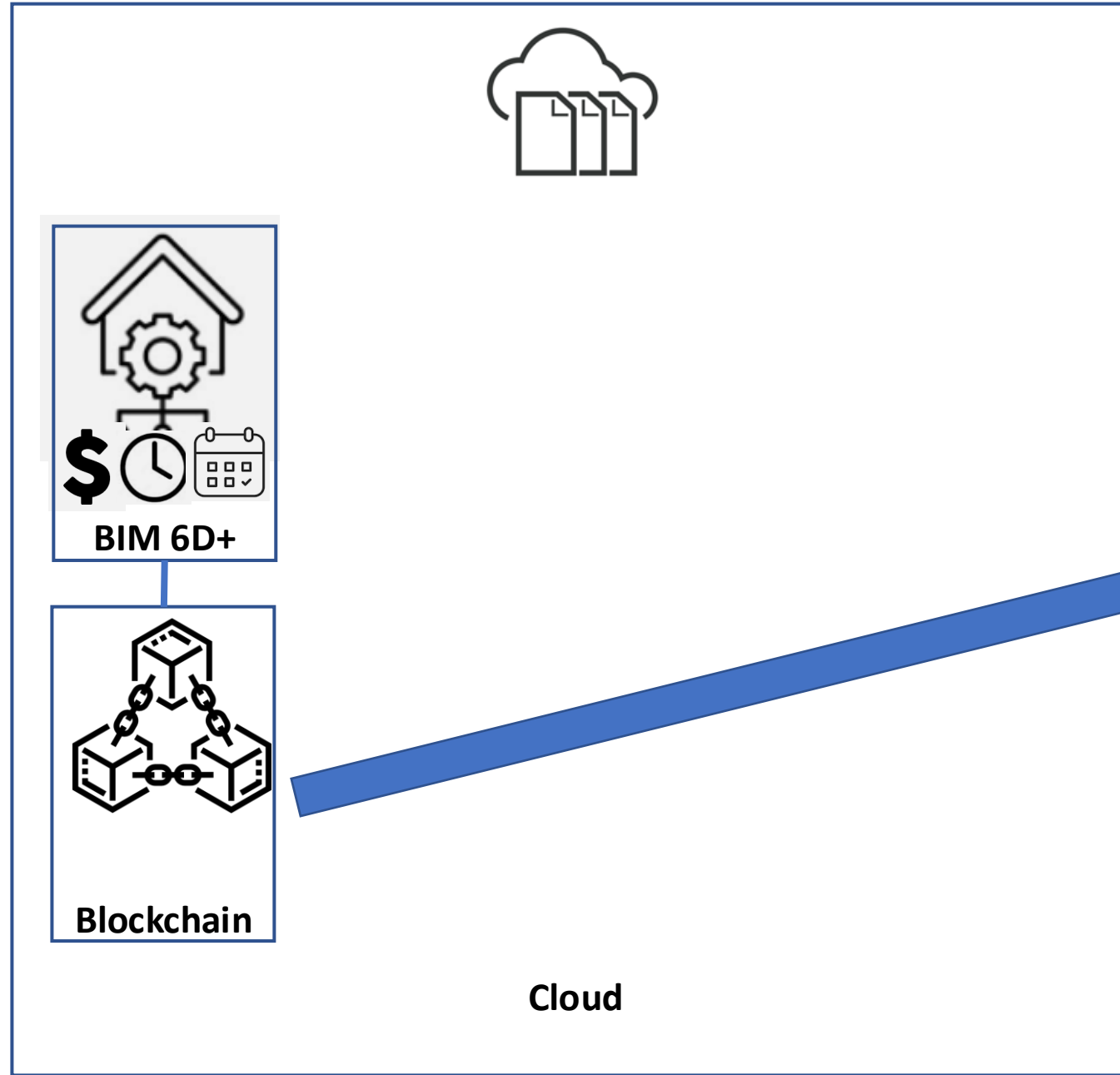
Blockchain Integration



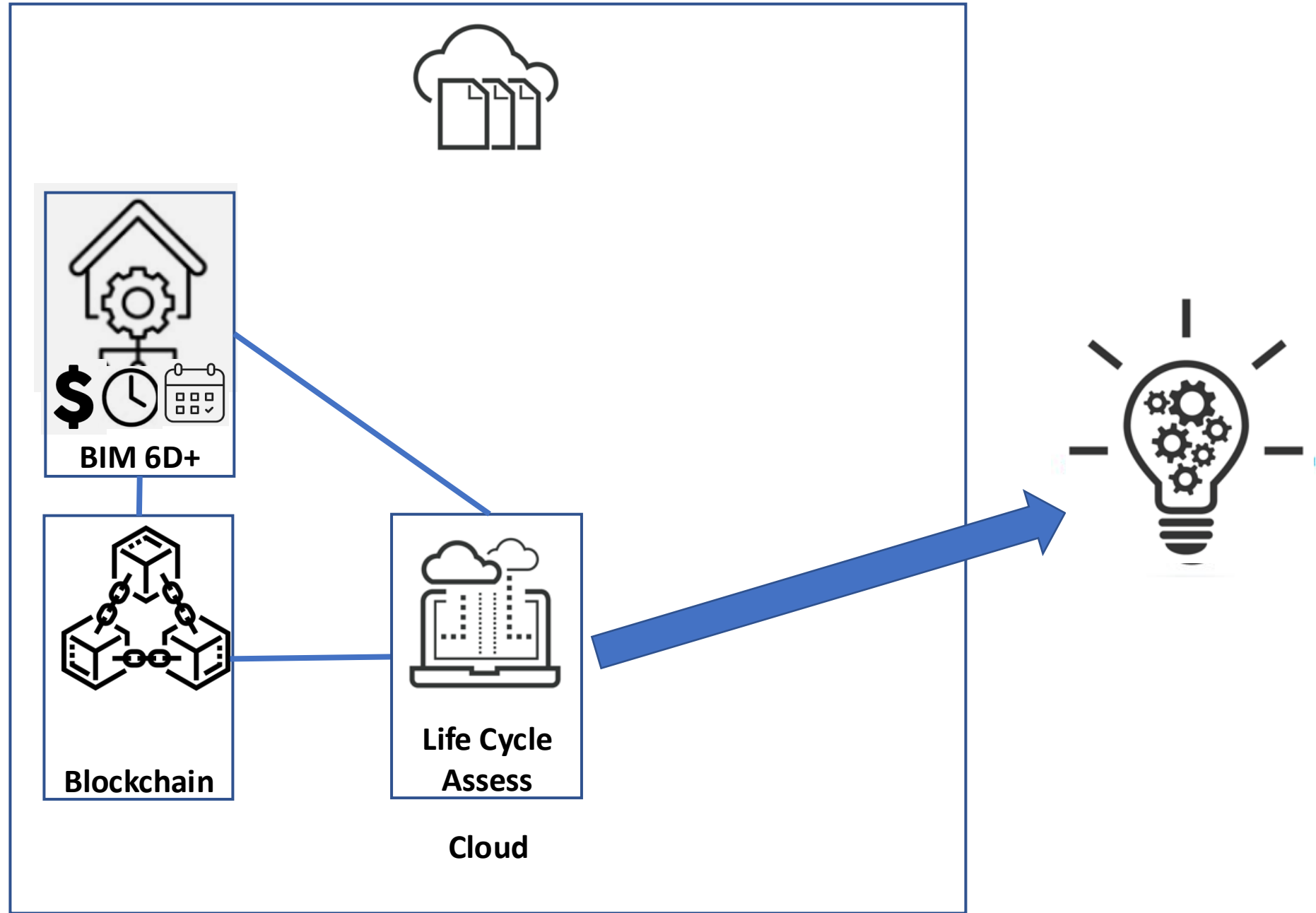
API



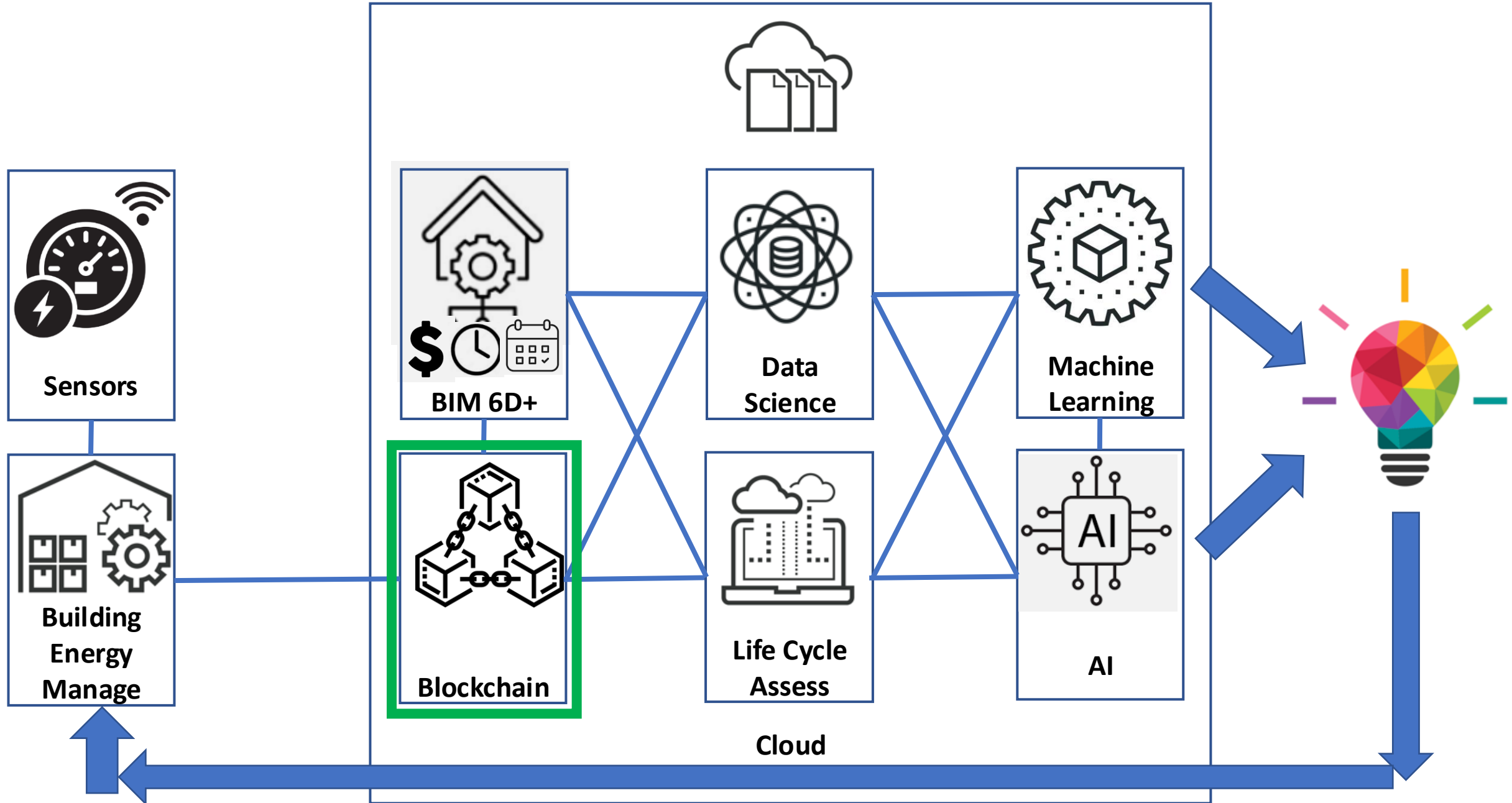
Technology Solution – Blockchain for Transaction Assurance



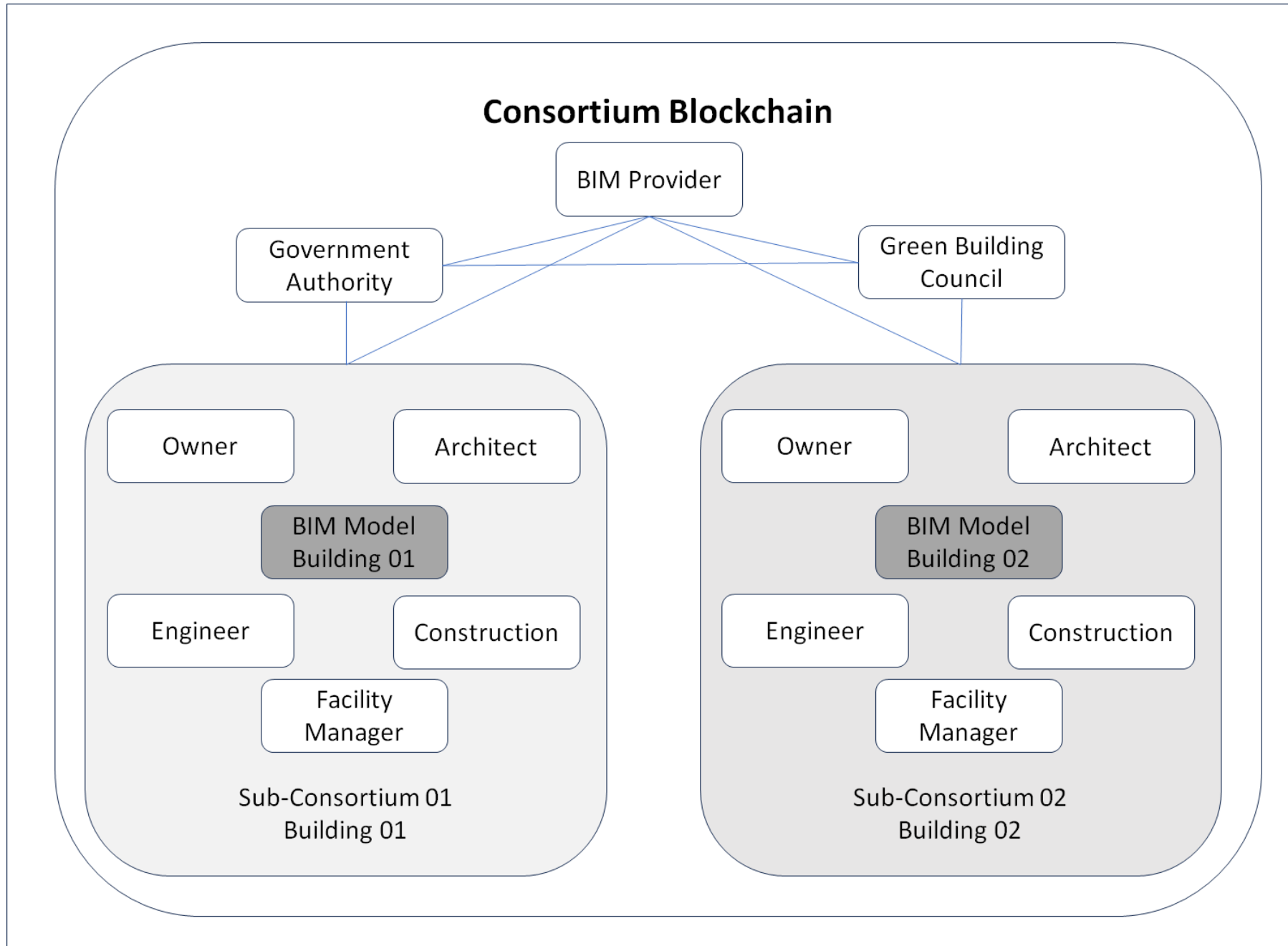
Technology Solution – Add Blockchain for Transaction Assurance



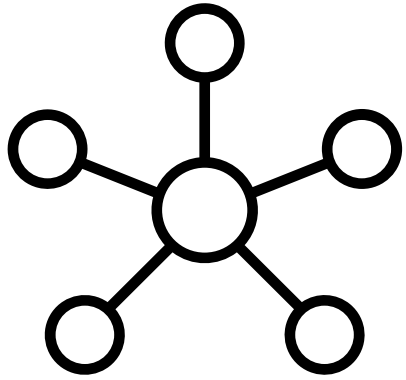
Technology Solution – Expand to Machine Learning and Artificial Intelligence Capabilities



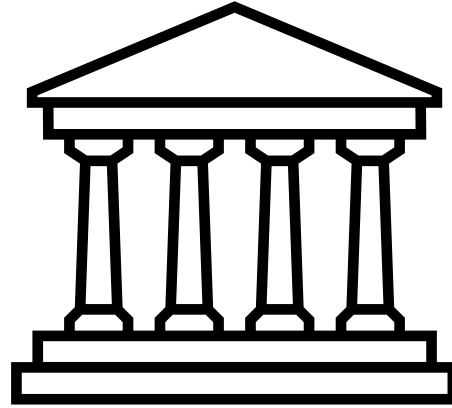
Consortium Blockchain



Implementation Challenges



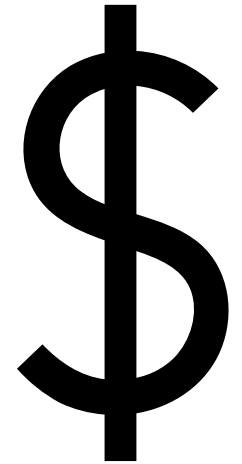
INTEGRATION



REGULATION



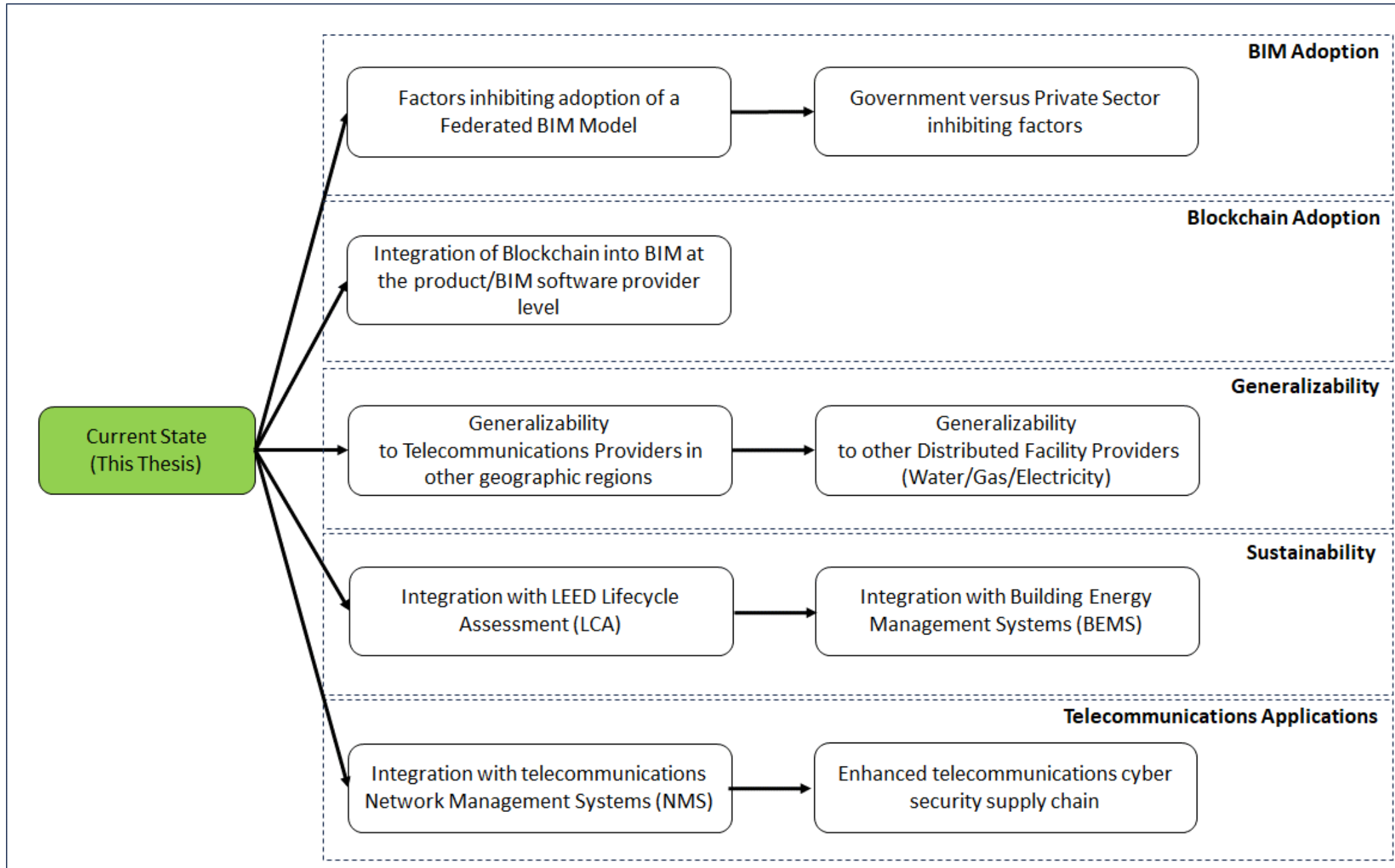
PRIVACY



FUNDING

- Technical Issues – Blockchain Integration
- Regulatory Environments – Legal issues around consortium
- Privacy – Data Protection
- Funding – CAPEX vs OPEX

Future Research





PEOPLE
PURPOSE
PERFORMANCE

HOPE

PROJECT
PROGRAMME
PORTFOLIO



Luke Desmond
Transformation Director
at Cisco

