



Southeast Asia Disaster Risk Insurance Facility

PROTECT THE GREATEST HOME OF ALL:

OUR COUNTRIES

SEADRIF is a regional platform to provide ASEAN countries with and technical advice to increase their financial resilience to climate and disaster risks.



Overview of the Knowledge Series

- Roles and responsibilities for the government officials within an internal insurance program, the associated stakeholders, including auditing, compliance and governance, supervisory.
- Multi year aspects such as renewals and re-assessment of exposures.
- Review of procurement considerations
- Dealing with claims management
- Incorporating innovations and technologies



FACTSHEETS 7 and 8

- Development of an implementation roadmap for a public asset financial protection program
- How governments can agree objectives and build consensus around priorities
- How to develop internal governance and oversight functions, and ownership at each level of the insurance program
- How risks are allocated across asset owners and operators



FACTSHEETS 1 and 2

- Roles and options available to construction of cost-effective insurance, including common insurance structures and case studies, their pros and cons against considerations of budgets, risk appetites, and government priorities
- Introduction of pooling and mutualization of large scale public assets insurance programs
- Insurance/reinsurance concepts of retention, deductible and exclusion



FACTSHEETS 5 and 6

- The importance and development of Public Assets Registries, and associated Enterprise Asset Management systems.
- How to assess and quantify asset exposure, sources of data, requirements for insurance transactions
- Introductions to the use of catastrophe analytics, burning cost / technical and market rates, tariff structures, risk based pricing methods, and underwriting.



FACTSHEETS 3 and 4



Emerging technologies for Public Asset Insurance

Facilitator: Benedikt Signer

Speakers:

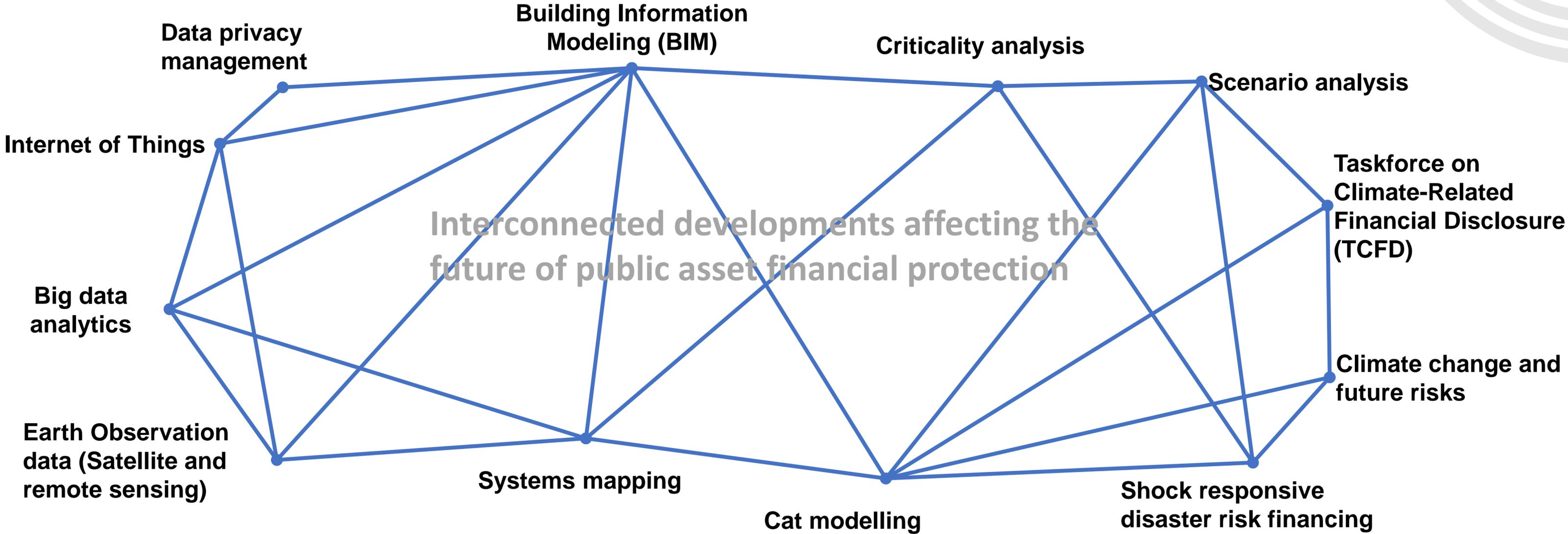
Matt Foote, Climate and Resilience Hub, Willis Tower Watson

Julie Dela Cruz, Arcadis

Lynette Tan, Singapore Space and Technology Ltd

Sally Sfeir-Tait, RegulAltion Ltd

Emerging technologies and trends





Poll (1)

Which of the emerging trends/technologies mentioned are most interesting to you? (select top three)

- Internet of things and big data analytics
- Earth observation and remote sensing
- Systems mapping and criticality analysis
- Data privacy and security management
- Building information modeling
- Catastrophe modeling
- Scenario analysis and stress testing
- Incorporation of future climate risks

Next generation catastrophe modeling

Matt Foote

Senior Director, Climate and Resilience Hub, Willis Towers Watson

The challenge of real asset risk assessment

- Public assets and infrastructure ('real' assets') have not been well-represented in catastrophe models or analytics
- Insurance / reinsurance products rely on data and modelling to quantify risk and enable effective pricing / capacity
 - Complex systemic risks – tangible and intangible
 - Asset lifetimes (20 years or more)
 - Climate risks are not just 'shock' events – chronic climate hazards are also critical to lifetime resilience and sustainability
 - Value at risk – requires consistency of quantification
- Poor data / analytics reduces effectiveness / availability of financial risk transfer options

Towards the next generation of data, models and products

- Hazard data
 - Multi-peril, chronic and acute/shock – via probabilistic models and scenarios
 - Regional and global coverage
 - Open data and modelling resources
- Exposure, vulnerability and resilience – integrating risk engineering
 - Consistent exposure data using data capture standards
 - Lifecycle risk management and resilience benefits
 - Integrate into modelled risk assessment
 - Systemic exposure / resilience (interdependencies, critical assets)
- Risk communication and decision making
 - Value at risk metrics (asset values, service provision) – balance sheet
 - Scenario tools – ‘what if’ strategic planning and risk transfer
- Financial innovation
 - Encourage and quantify benefits of investment in physical / operational resilience
 - New risk transfer products (reinsurance, bonds, parametrics) that reflect resilience benefits



Participating Institutions

An international coalition of investors, lenders, insurers, engineers, modellers and multilateral institutions
Representing over \$10 Trillion in assets under investment / management



Institutional Investors



Lending Institutions



Insurance



Legal



Engineering and Construction



Consulting/Auditing



Credit Rating Agencies



Climate Risk Data



Standards



Multilateral Institutions



Advocacy/Think Tank



Public Institutions



Financial data



Academic



International Organisations

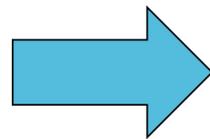


- CCRI aims to address the different levels (systems, asset and financing) in which the mispricing of physical climate risks in investment decision-making manifests, recognising both their interdependence and as well as their specific needs
- Financial risk transfer to encourage long term resilience investment is a key component



1. Systemic Risk

An **Investment prioritisation tool** capable of identifying key locations in a given jurisdiction with highest concentrations of economic and social value at risk over the next 20y

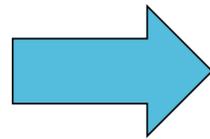


Key themes

- Asset priority (defined by value / service provision)

2. Asset Design & Structuring

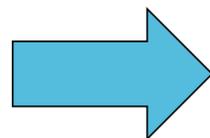
A **Cash Flow Modelling Framework** for the interpretation of Physical Climate Risks in asset valuation practices



- Chronic and shock (catastrophe) hazards and risk
- Asset value and exposure
- Vulnerability and resilience
- Asset lifecycle (20 years)

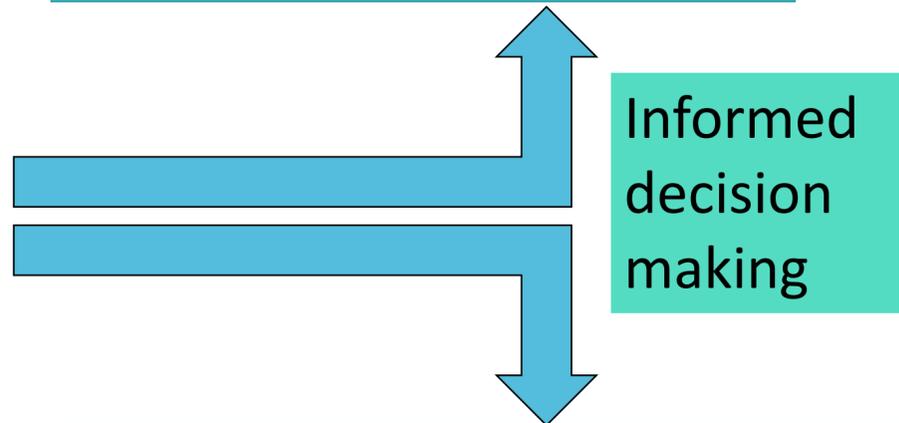
3. Financial Innovation

Resilience Bonds – a financial instrument that includes credit and insurance risk with the ability to advance and reward an effective integration of physical climate risks in a given investment



- Measurement / recognition of increased physical / systemic resilience

- ### Data
- Hazard
 - Exposure and value at risk
 - Vulnerability and resilience
 - Network / supply chain



- ### Analytics
- Chronic climate risk (e.g. heat stress, water stress, sea level)
 - Shock (e.g. storm, flood, fire)
 - Catastrophe modelling
 - Value at risk
 - Systemic / supply chain and interdependencies

Key innovations that can assist

- Integrating new approaches to model asset vulnerabilities and resilience into climate / catastrophe risk models
 - Systems and network analytics
 - Risk engineering to capture and model long term resilience benefits
- Better data to represent the nature of assets and their resilience
 - consistent open exposure data standards to improve asset data suitability
 - exploitation of geospatially referenced and valuation data
- Develop the next generation of physical climate and disaster risk models to provide forward-looking risk estimation
 - Integrate slow onset / chronic and acute / shock hazards and multi-perils
 - Scenario modeling to support strategic decisions against potential future states



Singapore Space
& Technology Ltd

Lynette Tan
Chief Executive
lynette.tan@space.org.sg

A satellite view of Earth at night, showing city lights and a satellite icon. The image is dark with a blue and white satellite icon in the lower right quadrant. The text "DEVELOPMENTS IN SATELLITES" is overlaid in white, bold, uppercase letters across the bottom half of the image.

DEVELOPMENTS IN SATELLITES

USE OF SATELLITES IN THE INSURANCE INDUSTRY

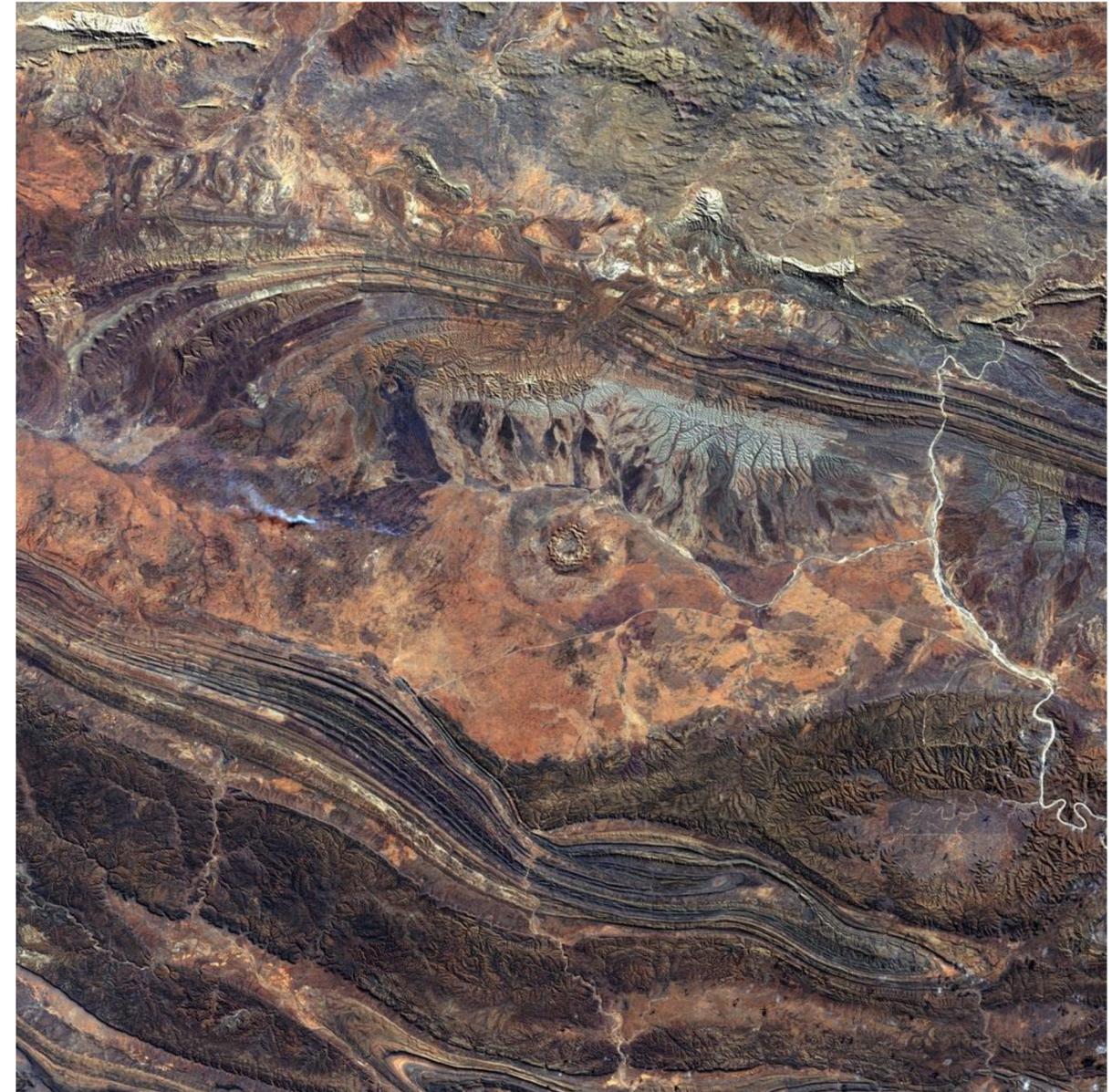
Interplay between Earth observation and risk financing

Transdisciplinary approach of **using Earth observation data, risk information products, and integrated decision support tools** delivers the confidence needed to make **improvements in timeliness, readiness, effectiveness and action.**

Particularly important to augment insurers' existing risk information with Earth observation data for **natural disasters like floods, landslides, hurricanes and earthquakes and construction and engineering projects at cities near the coast or on volcanoes.**

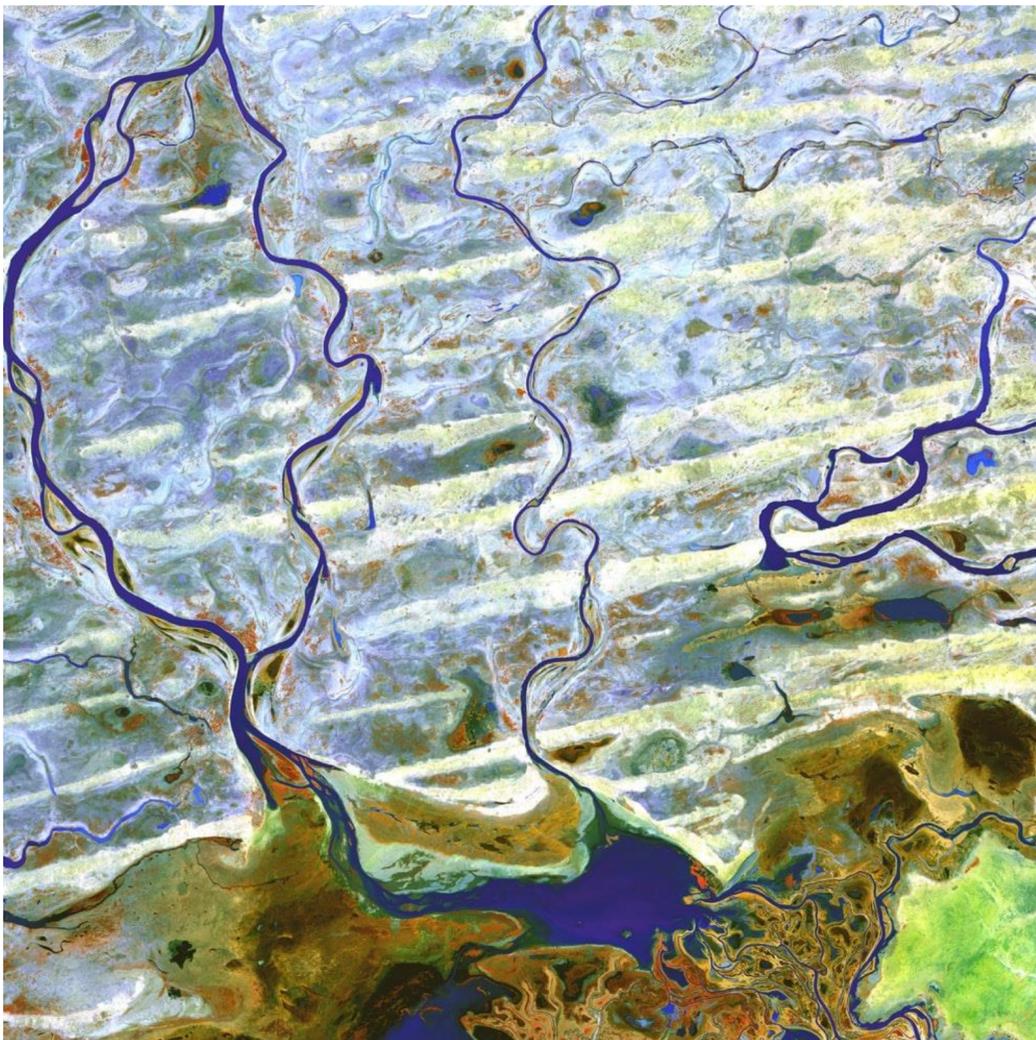
Two main categories of satellite data:

- 1. Archived data:** In conjunction with models, archived data can contribute to **prediction and risk assessment tasks.** Archived data also provides **objective evidence for claims validation;**
- 2. Real time data:** During a catastrophe, rapid dissemination of real time data **assists in loss control and logistics planning for immediate response** by loss adjusters



USE OF SATELLITES IN THE INSURANCE INDUSTRY

Interplay between Earth observation and risk financing



As part of the **European Space Agency's** activities to **develop the industrial use of Earth observation-based services** to stimulate growth within the European service sector, a consortium of insurers and reinsurers, including **Swiss Re, Munich Re, Allianz, Willis and Guy Carpenter**, collaborated with **Zurich-based catastrophe insurance market data company PERILS** to assess the use of receiving realtime flood extent information based on data from **a constellation of six European and Canadian remote sensing satellites.**

Satellite data on the area of significant floods was delivered to a web-based platform hosted by PERILS for the business partners.

USE OF SATELLITES IN THE INSURANCE INDUSTRY

Developments in the satellite industry

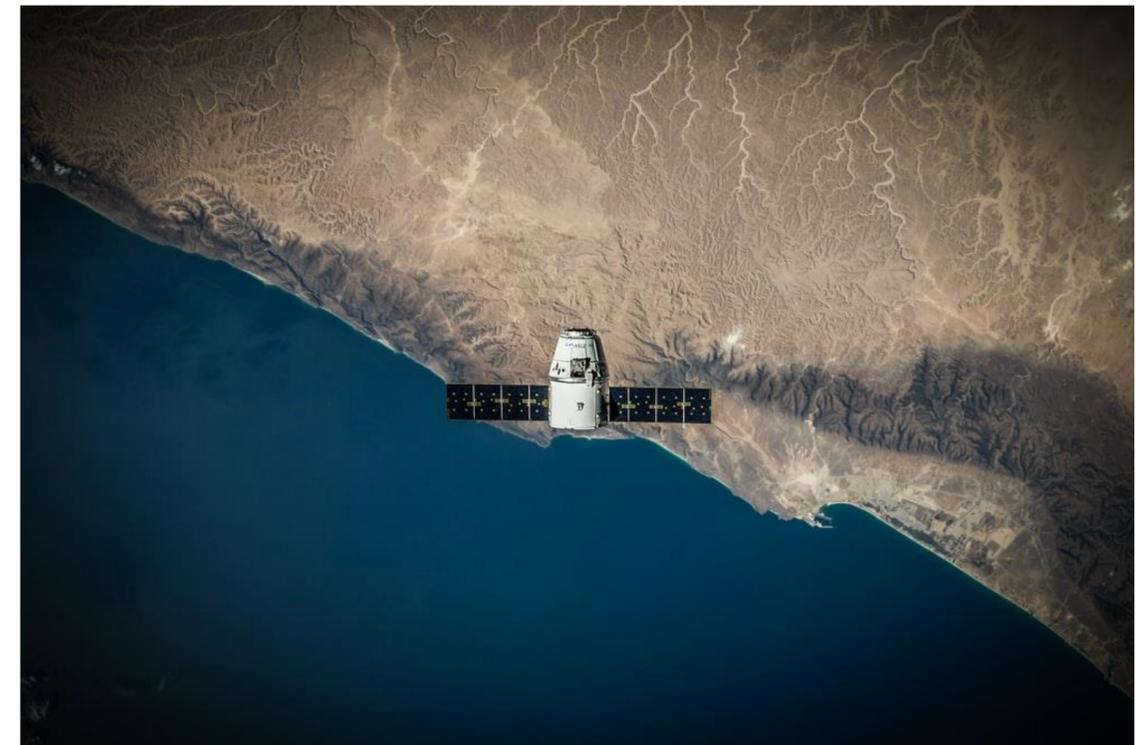
The price and technological advancements of satellites have significantly lowered the barrier of entry: **Today, a \$3 million satellite that weighs less than 10 pounds can capture significantly sharper images than a \$300 million, 900-pound satellite built in the late 1990s.**

There are now **730 satellites observing Earth from space**, with 2,220 more coming in the next 10 years.

Insurers and financial institutions **don't need to launch satellites into space to access this new source of information** — they can simply **buy the analysis from satellite operators.**

According to The Globe and Mail, satellite imagery **"speeds up predictions of how many claims insurers will receive** and can provide enough information to **cut down on the amount of time adjusters must wade through disaster zones."**

It also reported that "Swiss Re uses a software system called CatNet to **overlay satellite images of severe weather onto Google Maps, allowing them to zoom in** and assess the extent of a disaster soon after it occurs."

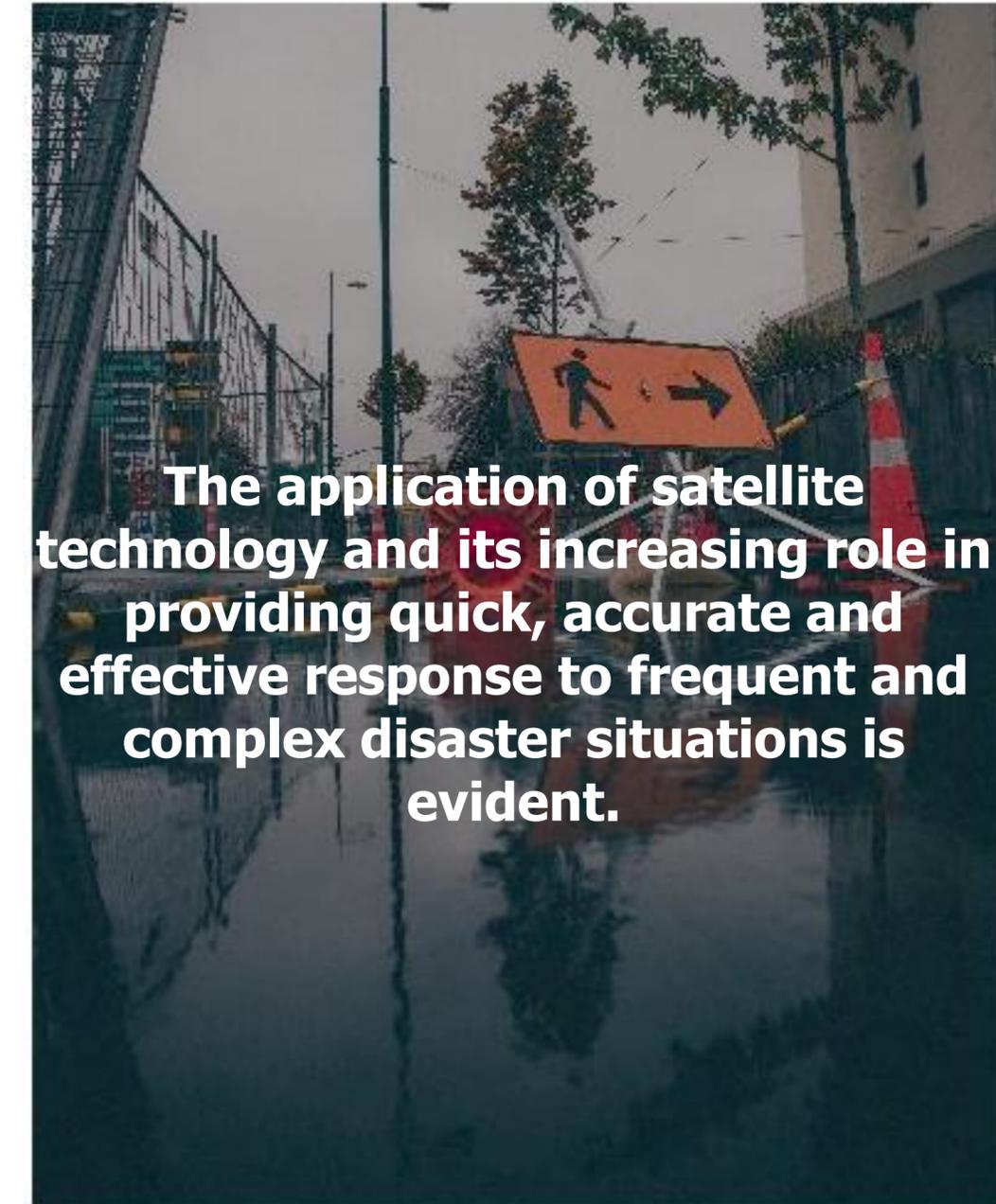


A satellite-style image of Earth at night, showing city lights and a satellite in orbit. The text "HADR CHALLENGE" is overlaid in white, bold, sans-serif font. A small satellite icon is positioned above the text.

HADR CHALLENGE

HADR CHALLENGE

Humanitarian Assistance and Disaster Relief



The application of satellite technology and its increasing role in providing quick, accurate and effective response to frequent and complex disaster situations is evident.



Across the world, countries have recognized the need of utilizing remote sensing satellite technologies as a critical tool in real-time disaster management.



The HADR challenge was launched to tap into the creativity of space tech companies and researchers to identify translatable solutions to complex problems of coordination and technology usage in HADR.

HADR CHALLENGE 2021

Humanitarian Assistance and Disaster Relief

Partner

Disaster Risk Financing
& Insurance Program



World Bank Disaster Risk Financing
& Insurance Program (DRFIP)

Supporting Organisation



Regional HADR
Coordination Center

Every year, the cost of damages from natural disasters such as floods, earthquakes and landslides amount to approximately **300 billion USD**.

In the case of a natural disaster, it is crucial for governments to quickly address recovery efforts and manage the financial aspects of the disaster's impact. This is especially true for **market-emerging economies such as countries in Southeast Asia**.

The World Bank Group's **Southeast Asia Disaster Risk Insurance Facility (SEADRIF)** has started a regional catastrophe risk pool especially for **flood risks developed by and for Cambodia, Lao PDR, and Myanmar** with technical assistance from the **World Bank Disaster Risk Financing & Insurance Program (DRFIP)**.

HADR CHALLENGE

Humanitarian Assistance and Disaster Relief

Develop an innovative programme/application

Aim is to provide a significant increase in efficiency and effectiveness of humanitarian assistance and disaster relief operations.

Programme/app shall make use of a variety of data from space or airborne sensors as well as other sources

Assuming communications over a relief area can be established through an ad-hoc network provided by satellite technology.

Supporting Partners



**Defence Science and
Technology Agency**



**Regional HADR
Coordination Center**



**Singapore Civil
Defence Force**



**Robust and reliable
communication solutions**



**Data & information
verification and analytics**



**Mapping Solutions via
satellite imagery**



**Logistics & telemedicine
management through
geolocation capabilities**

Disaster Risk Financing & Insurance Program

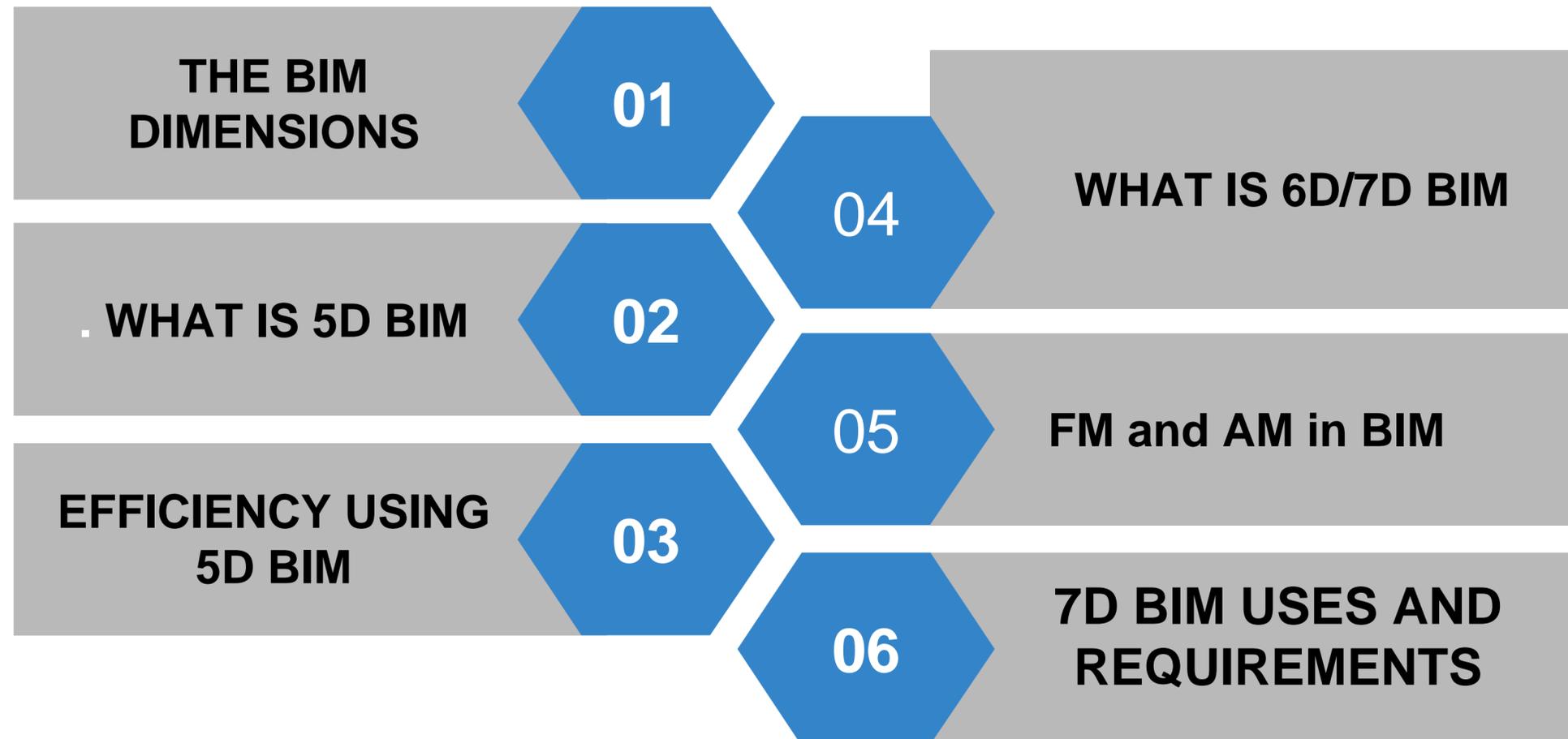


TAKE CRISIS OUT
OF DISASTER
www.seadrif.org

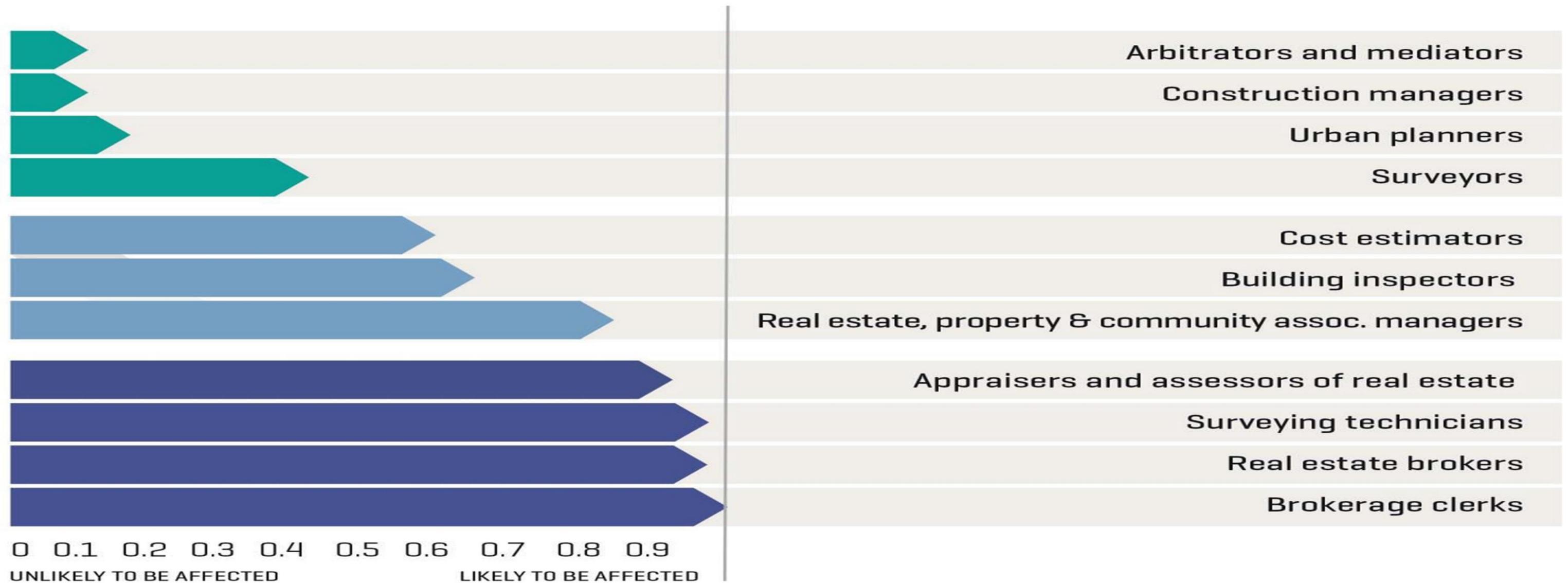
Emerging Technologies for Public Asset Financial Protection:
3D BIM, 5D BIM, 6D BIM and 7D BIM

Julie Christie dela Cruz
Director, Arcadis

OUTLINE OF THE PRESENTATION



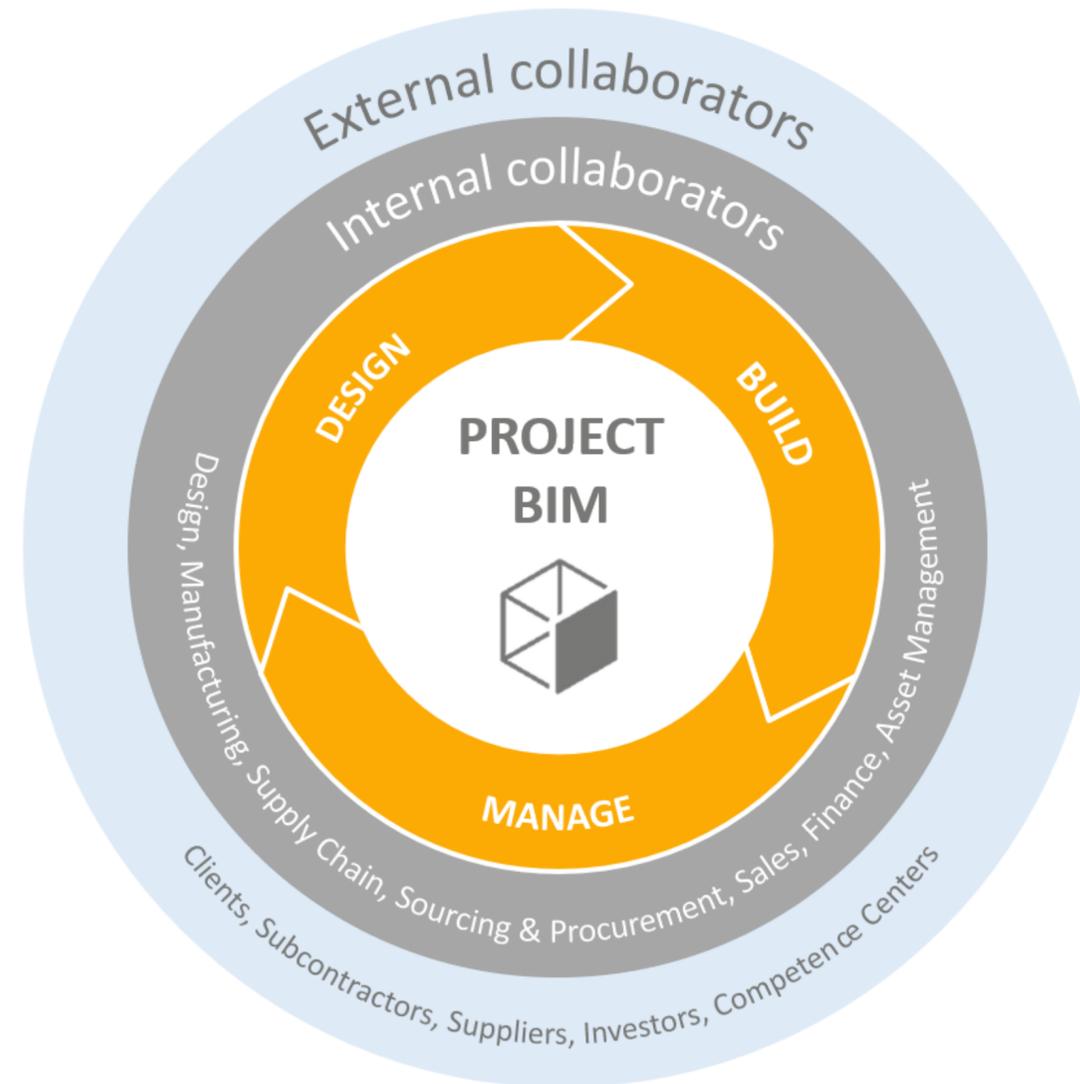
IMPACT TO OUR PROFESSION: TECHNOLOGY DISRUPTION



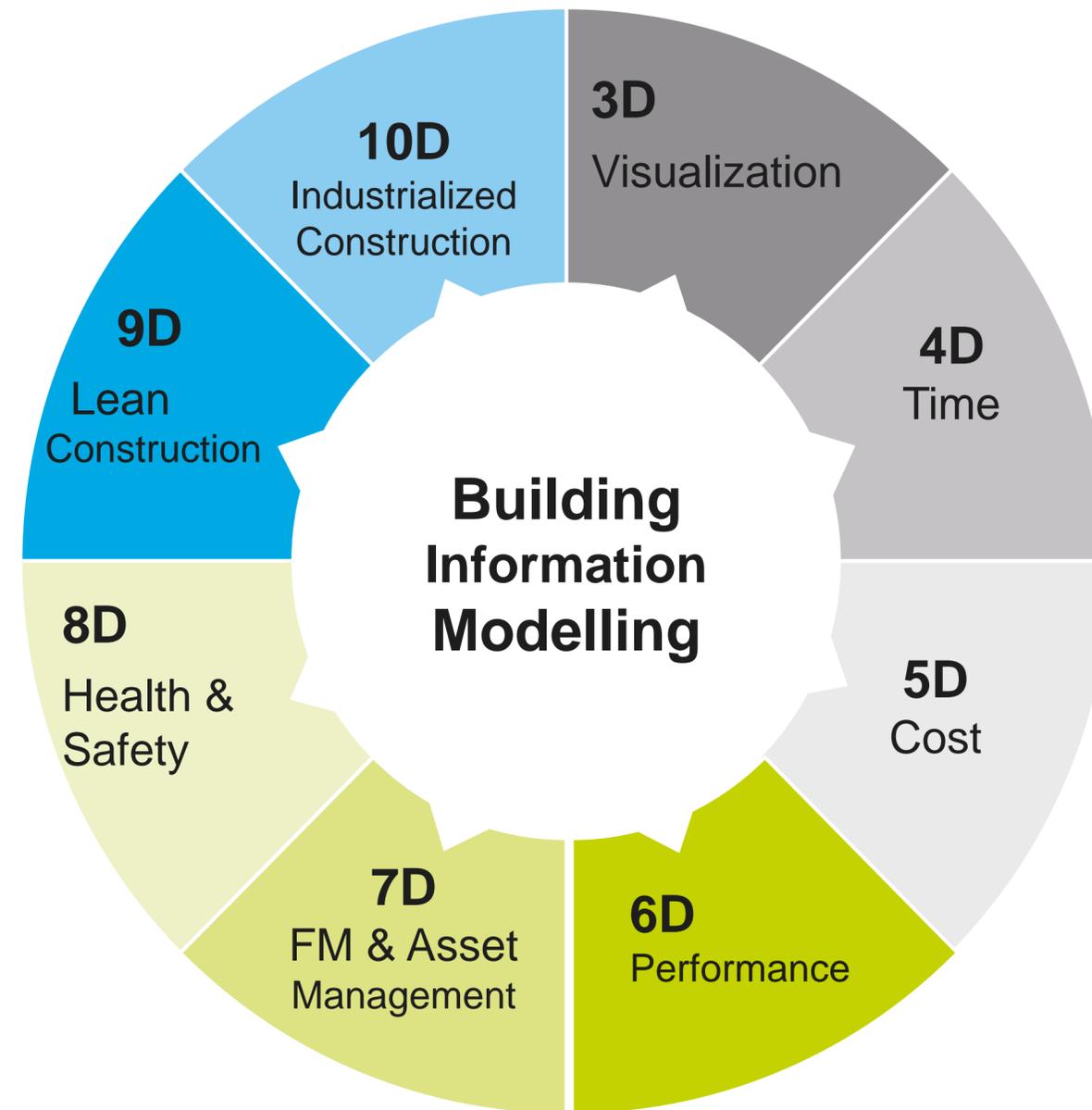
Probability of professions being affected by technology

Source: Frey and Osborne 2013

BIM PROJECT LIFECYCLE

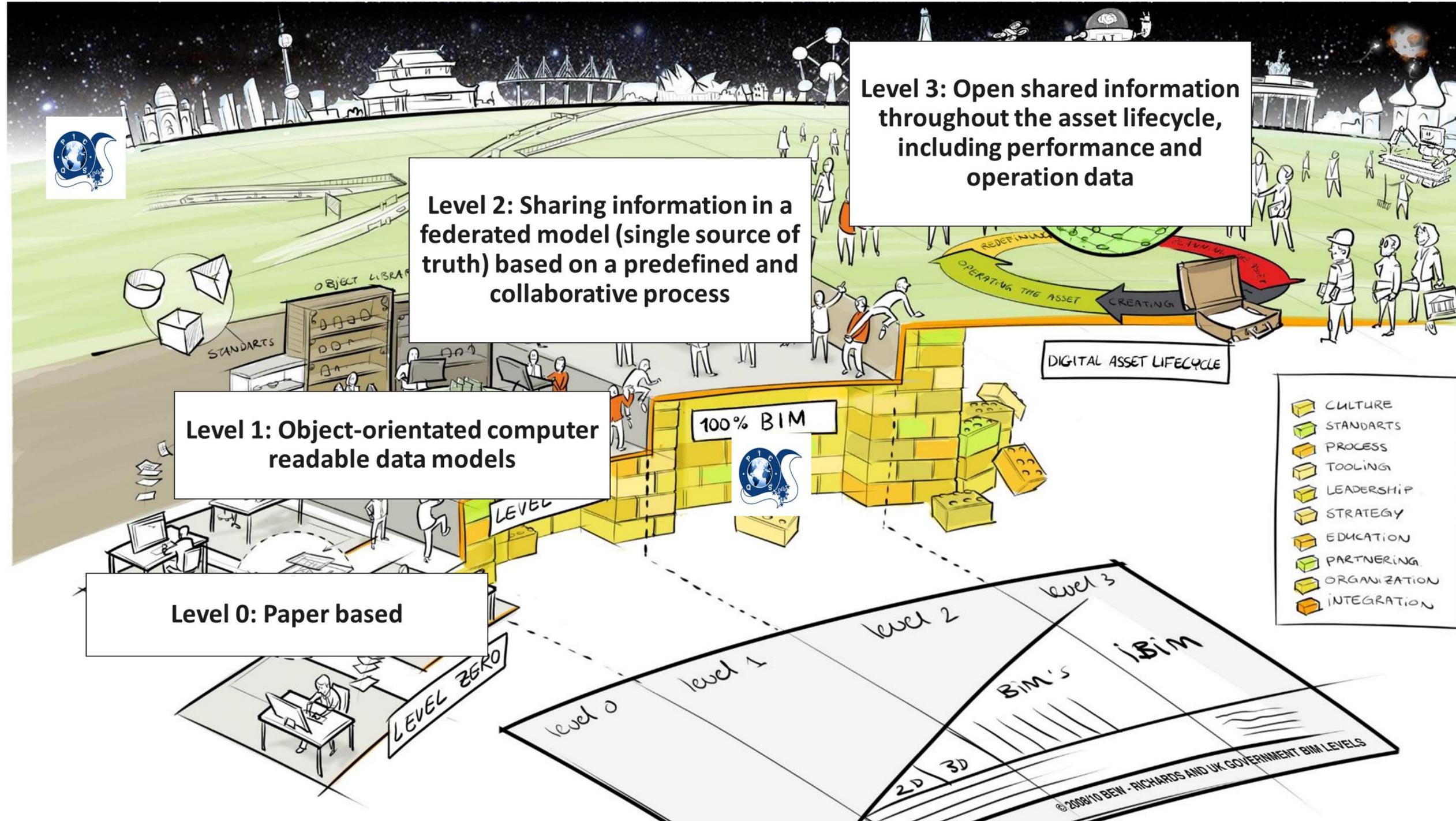


BIM is a data-driven holistic modelling system

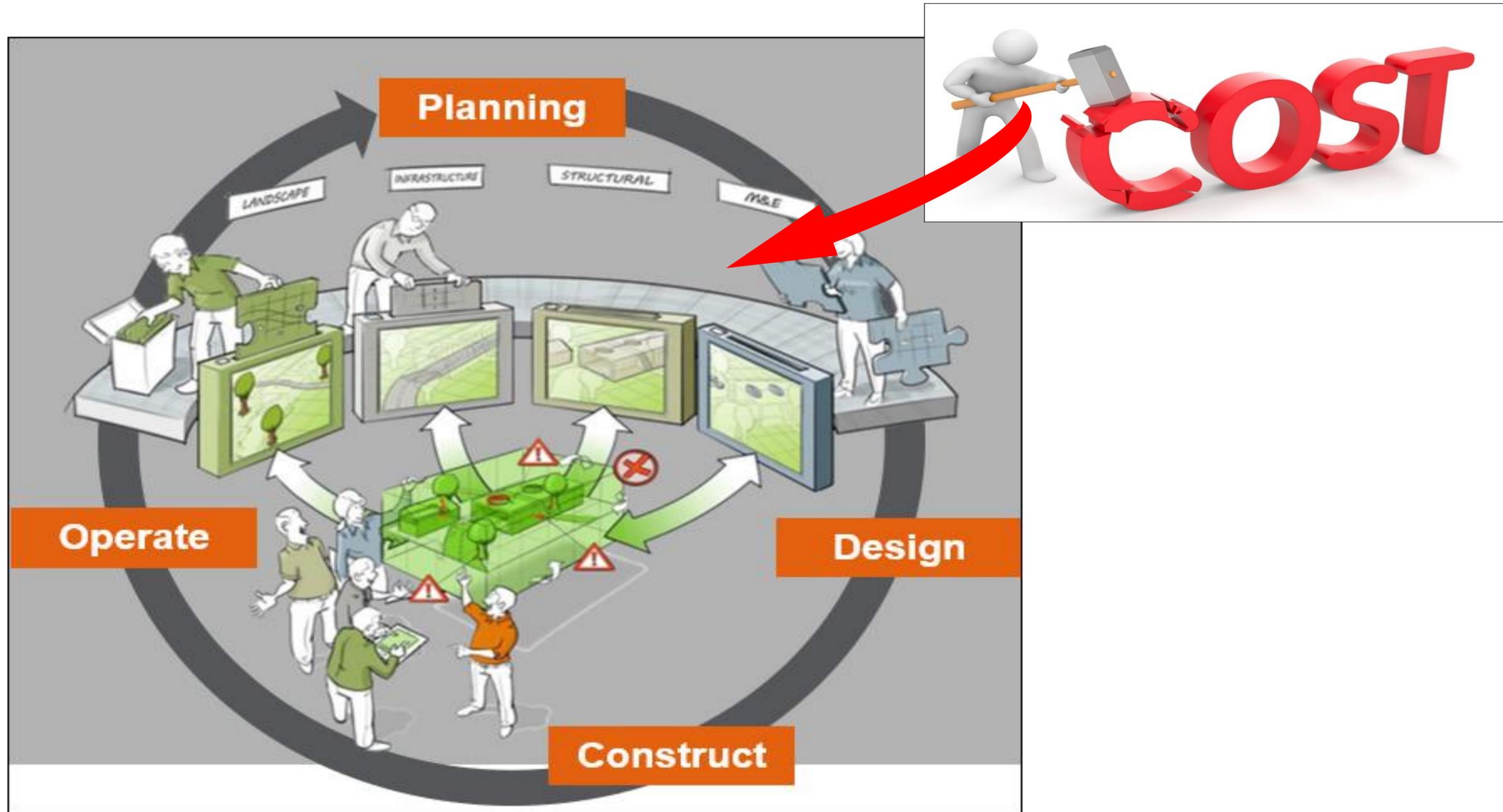


COMMON DATA STANDARD IS VERY IMPORTANT

BIM MATURITY LEVELS



CONCEPT OF 5D BIM



BIM 5D is simply addition of Cost to BIM 3D+ 4D BIM (Time)

5D BIM IN THE PROJECT LIFE CYCLE

THE 5D BIM PROCESS THROUGHOUT THE 7 RIBA STAGES



CLEAR UNDERSTANDING OF CLIENT'S NEED

STAGE 0 - STRATEGIC DEFINITION

- Employer's Information Requirement (EIR) is submitted by employer
- Pre-Contract BIM Execution Plan (BEP) prepared

CONFIDENCE IN DESIGN AND DELIVERY

STAGE 1 - PREPARATION AND BRIEF

- Comprehensive Delivery Plan (Post-Contract BEP)
- Protocols
- Feasibility Cost Studies

BETTER DESIGN COORDINATION AND APPROVAL

STAGE 2 - CONCEPT DESIGN

- Development of "Cost-Ready" Model
- Cost Modelling Guide
- Cost Coding Process
- Clash Detection



HAND OVER ASSET RICH DATA

STAGE 6 - HANDOVER

- Submit Asset Information Model as per BEP and EIR

UNCERTAINTIES IN DESIGN ARE ADDRESSED AT EARLIER STAGE = LESSER VARIATION CLAIMS

STAGE 5 - CONSTRUCTION

- Interim Payment Valuation
- Variation Assessment

BETTER DESIGN = LOWER RISK IN PROCUREMENT

STAGE 4 - TECHNICAL DESIGN

- Tendering
- Transparency of Data
- Single Source of Truth

FASTER DELIVERY OF COST ESTIMATES = EARLY COST CERTAINTIES

STAGE 3 - SPATIAL COORDINATION

- Maintaining semi-automated cost plan
- Benchmarking
- Rate library

BIM TOOLS USED BY ARCADIS:



5D BIM: ENABLING EFFICIENCIES

Added value:

ABOUT 30% is SAVED IN TIME AND COST USING 5D BIM AGAINST TRADITIONAL METHOD.

MORE TIME IS SPENT ON VALIDATION AND QA/QC THAN SPENDING TIME DOING QUANTIFICATION

...creating more value for less money...

BIM GUIDE FOR AID

(Asset Information Delivery)

ORGANISATIONAL INFORMATION REQUIREMENTS

IDENTIFY



Asset Information Requirements

SPECIFY



BIM Execution Plan

GUIDE

Project Information Model

EXTRACT



Asset Information Model



Asset Management System

ESTABLISH

FRAME

Employer's Information Requirements

6D/7D BIM WORKFLOW



As-Built BIM

Model forms the basis for Asset Model



AIR

Asset Information Requirement (AIR) from the client will define the scope of FM & FM Systems



ASSET LIST

As per AIR, list all the maintainable assets and optimize maintainability with IOT Analytics. This will determine the extent of energy optimization

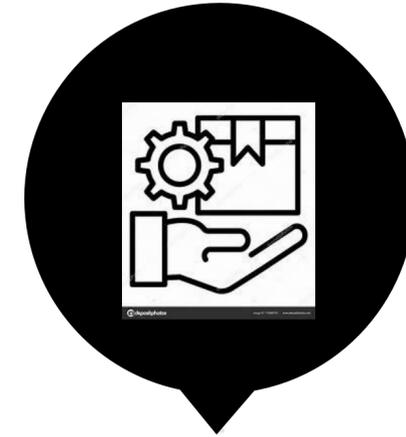
6D BIM Modeling (6D BIM)



IoT SENSORS

Sensor data from critical asset of the AIR list are used to analyze & optimize system performance of MEP System

BIM FM (7D BIM)

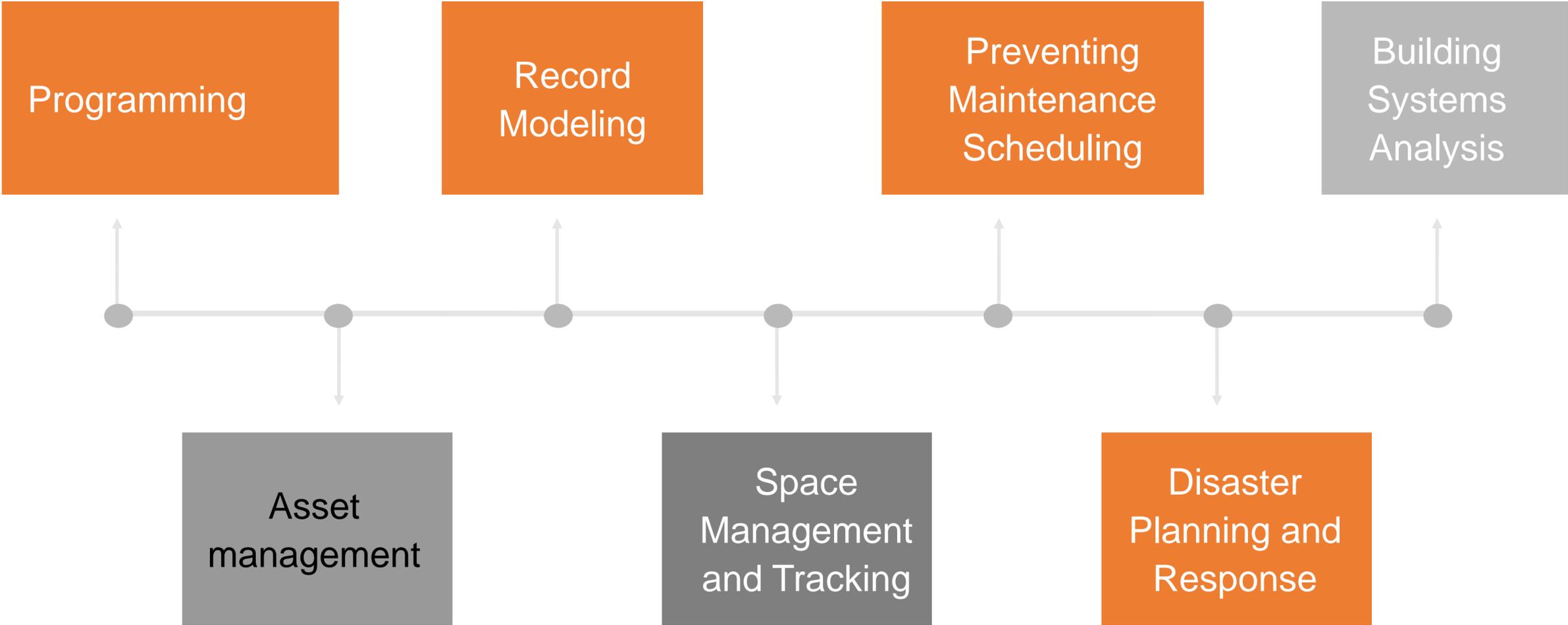


FM Systems

Constant monitoring of MEP System Performance requirements based on the sensor data and usage of the facility & mechanical performance

Digital FM

BIM USES FOR FACILITY MANAGEMENT





Digitization

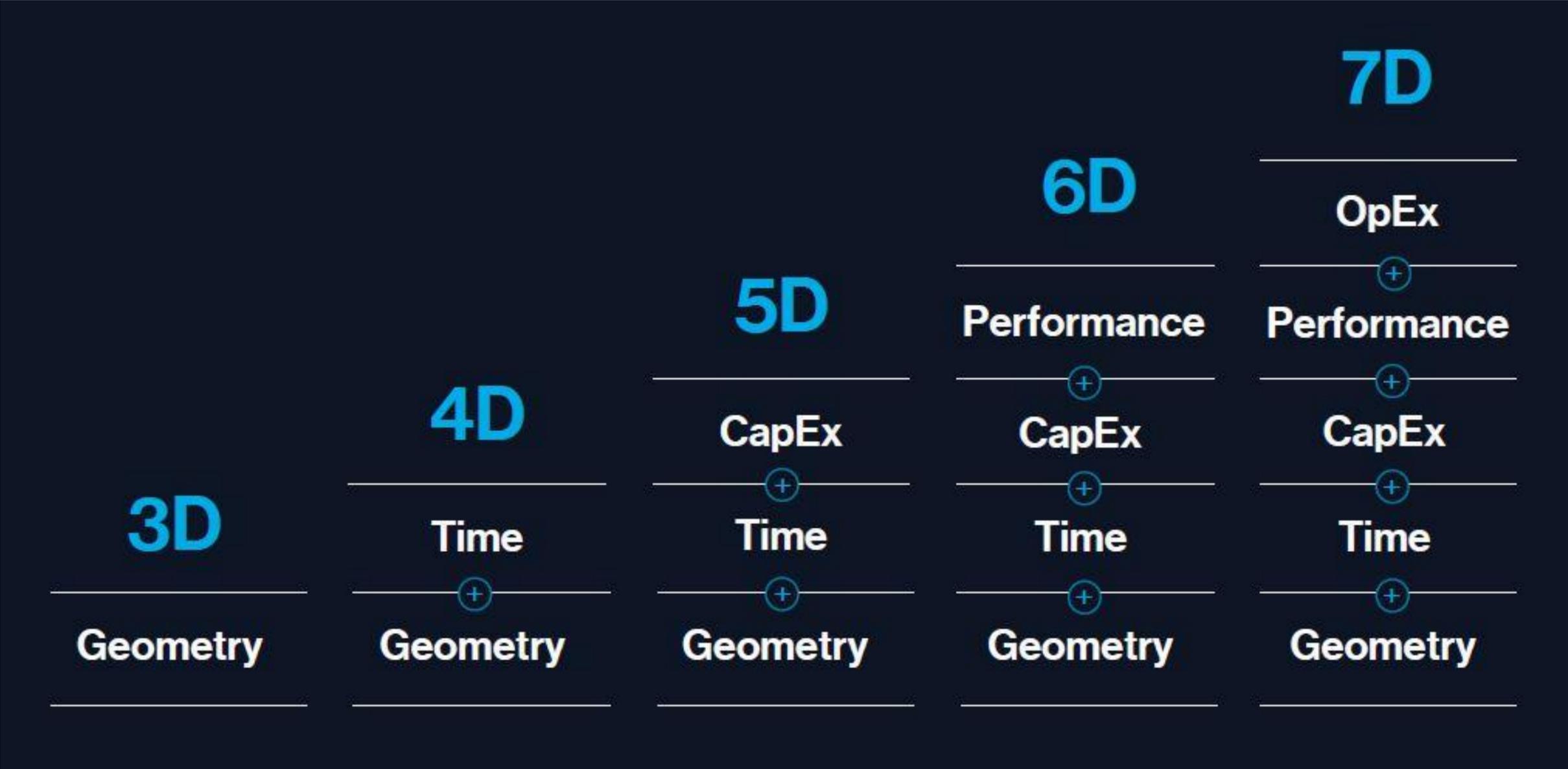
Concerns

- Increasing complexity of assets requires more data-driven solutions
- Need for integrated asset information
- Data management
- Undertaking surveys quickly

Solutions

- Automated inspections using drones
- Data collection site tools
- Integrated AM models, incorporating BIM
- Decision support tools for auditing, modeling (digital twins), analytics, maintenance and planning

Summary



THANK YOU

Future proofing data access and collaboration

Sally Sfeir-Tait

Chief Executive Office, Regulaition Ltd

Honorary Professor, University College London

What we will talk about

Data access today

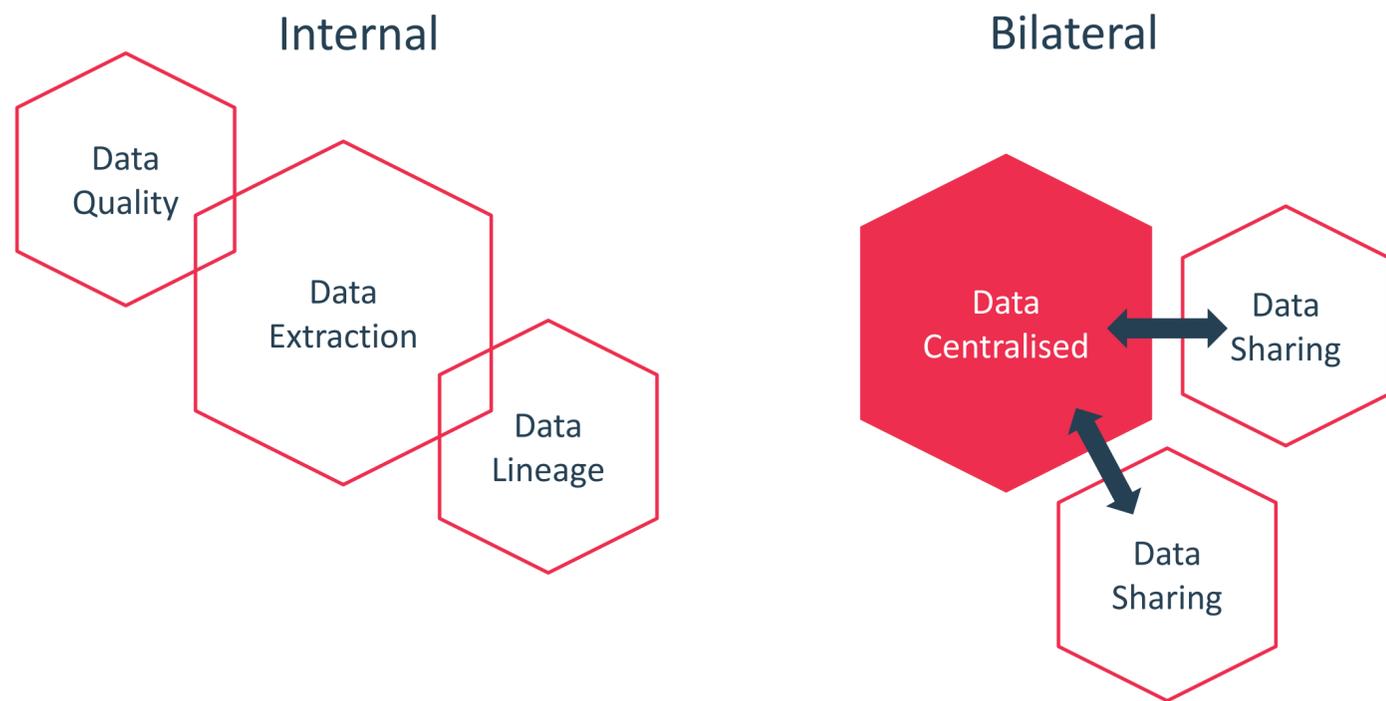
Case Study (UK) – Digital Regulatory Reporting

Case study – privacy-preserving data access (AIR Platform)

Data Access today

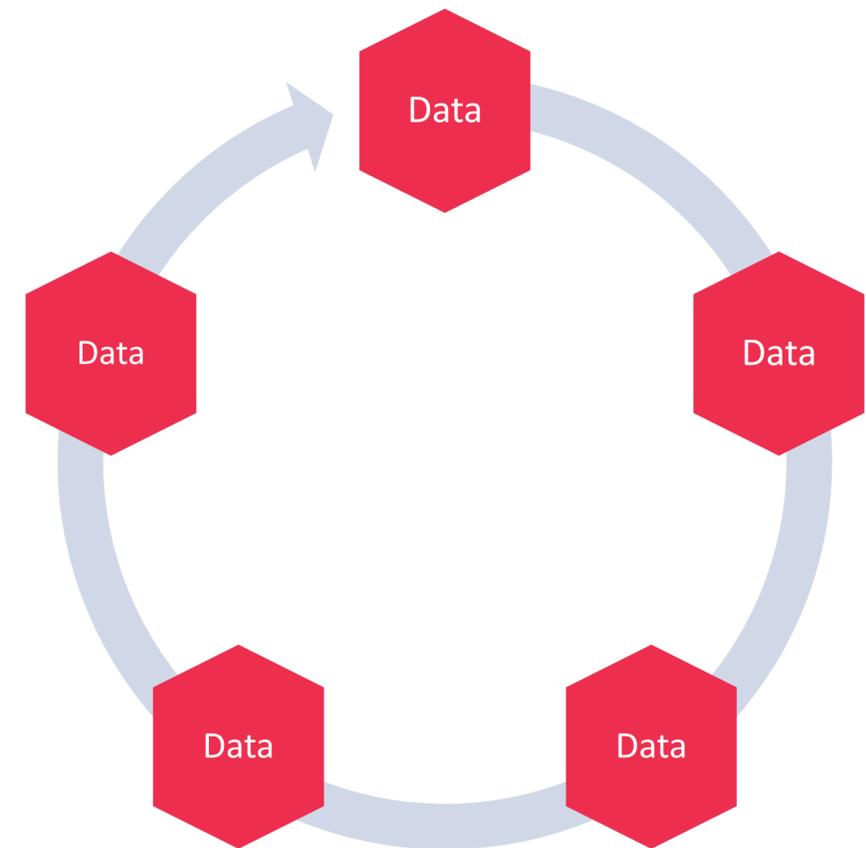
An ecosystem approach

Today



Future - Decentralised

Multilateral

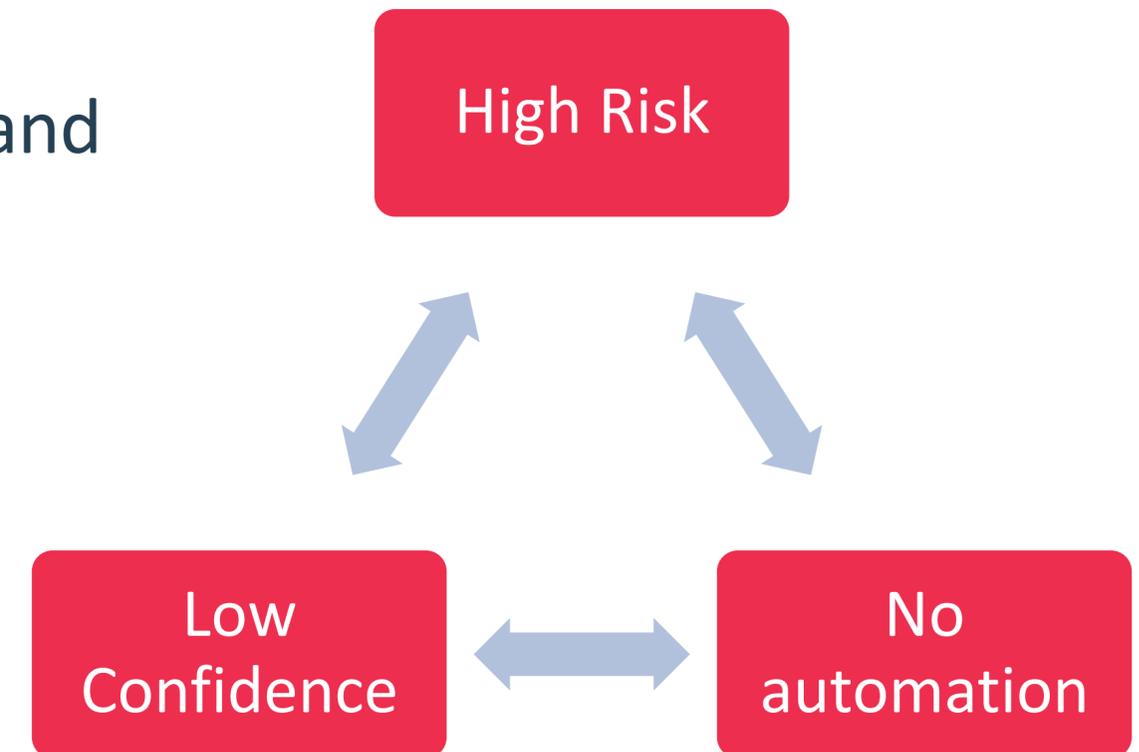


Case Study – UK Financial Services (Banking)

Bank of England and Financial Conduct Authority (2016 – On-going)

Background

- UK regulatory need real-time data for financial stability and systemic risk
- Regulatory reporting costs to banks - £2-4Bn/Annually
- Why?
 - Legacy systems
 - Data quality (lineage, extraction, transformation)
 - Manual process



Case Study – UK Financial Services (Banking)

Project Phases

- Phase 1 – Viability POCs (2017-2018)
- Phase 2 – Explore existing solutions (2018-2019)
- Phase 3 – On-going
 - BoE/FCA announce outline plans to develop internal data and analytics capabilities
 - BoE/FCA announce plans to move to data-pull
 - FCA updates internal data reporting system (GABRIEL)
 - Digital Regulatory Reporting critical part of regulators' Data Strategy
 - FCA leads multiple initiatives as catalyst for privacy preserving data sharing

Case Study – UK Financial Services (Banking)

Why is it relevant?

- Demonstrates problems if no automation *ab initio*
- Demonstrates the importance of a considered technology infrastructure
- Data providers will experience similar costs without automation

Policy, legal and tech
must work together

- Data sharing – public-public
- Data sharing – public/private
- Data sharing – private/private (public assets)

Case Study – UK Financial Services (Banking)

Future proofing – Consider macro trends

- Ever increasing cybersecurity threats – Solutions must future proof security
- Exponential growth of data – handling and sharing data very resource heavy
- Next generation technologies (blockchain, federated learning, IoT, domain specific languages)
- Data sharing legislation/data localisation requirements

You don't
have to
compromise

Best risk
management
practices support
economic growth

An ecosystem approach

AIR Platform public/private collaboration platform

- for repeatable and automated data sharing and access
- for data governance in compliance with legislation and policies
- for sharing insight from data

Exploratory insurance and public sector projects with

Public

Confidential

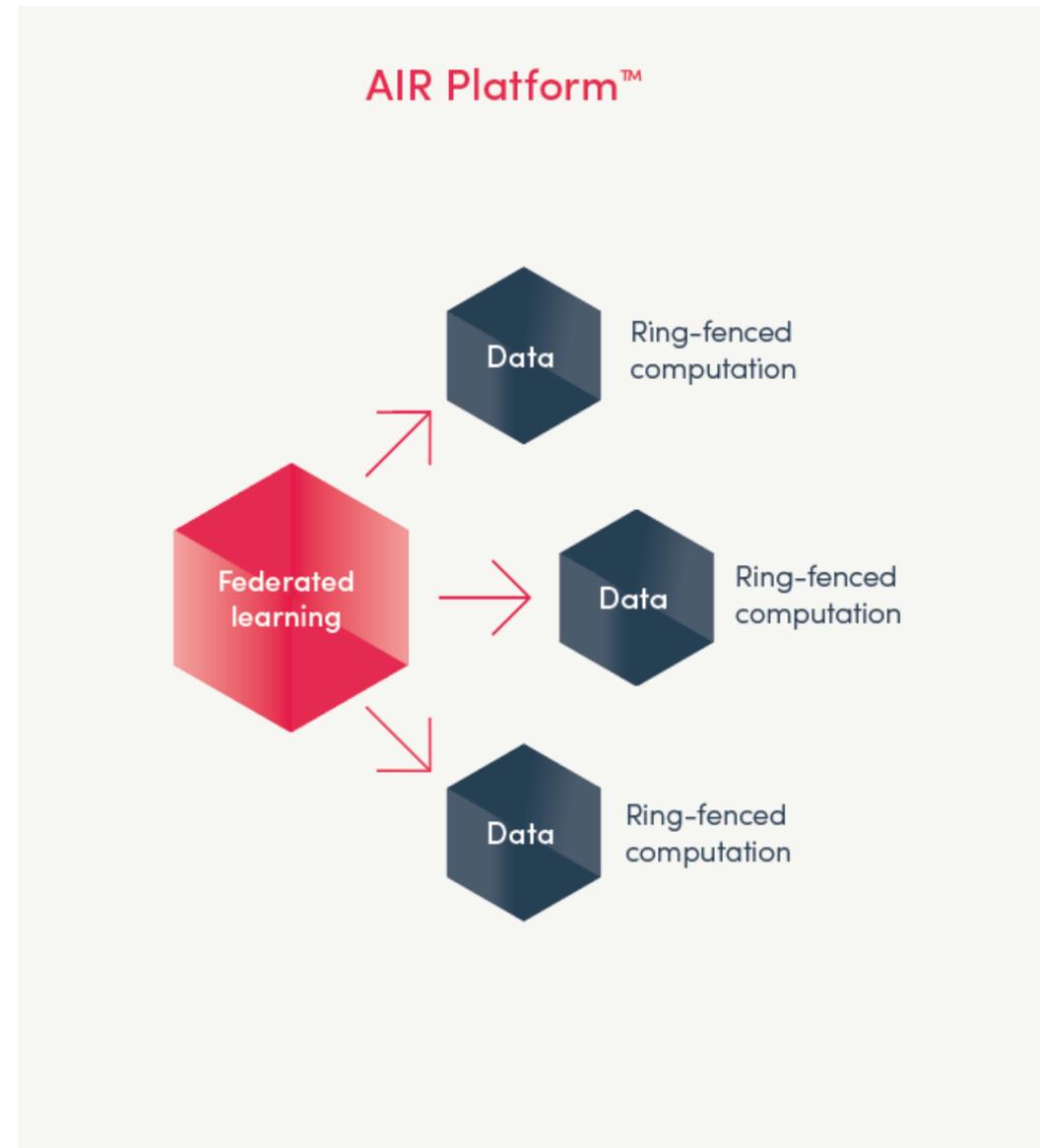
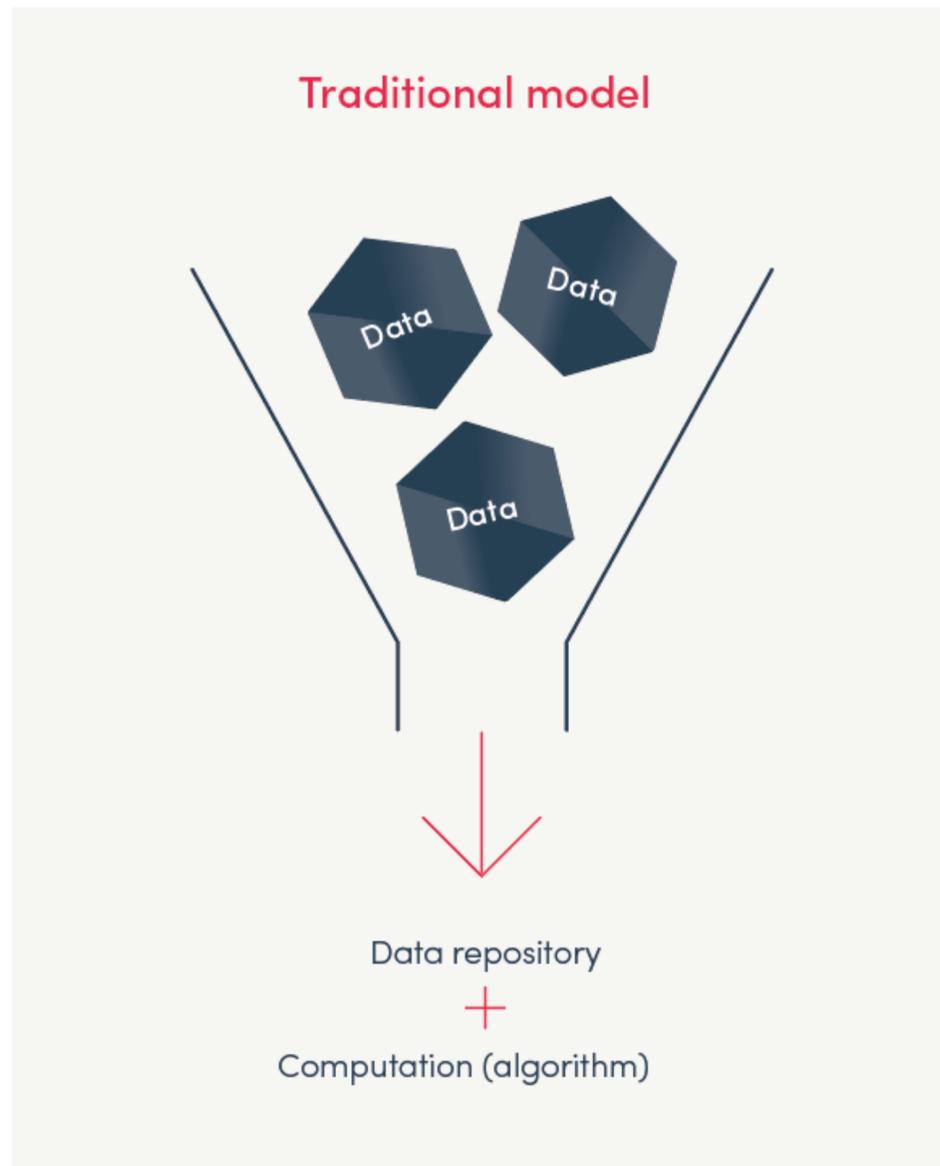


The AIR Platform™ creating a safe and collaborative ecosystem for shared insight

Organisations can harvest insight from the most sensitive data with the confidence that they are not compromising their security or integrity.



How is the AIR Platform different?



AIR

Thank you
Sally.Sfeir-tait@regulaition.com

Knowledge series summary

Benedikt Signer

Key statistics (May – Oct 2020)*

 **11** Webinars

 **8** Fact sheets

 **25** Different Speakers

 **>18** Engagement Hours

Participation  **323** Unique attendees

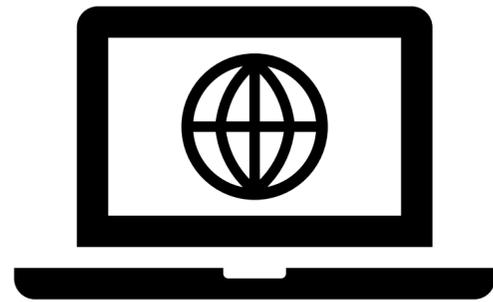
Diversity of attendees  **227** Attendees from governments

 **57** Organizations/divisions represented

Engagement of attendees  **142** attendees attended multiple webinars

 **41** attendees attended over half of the webinars

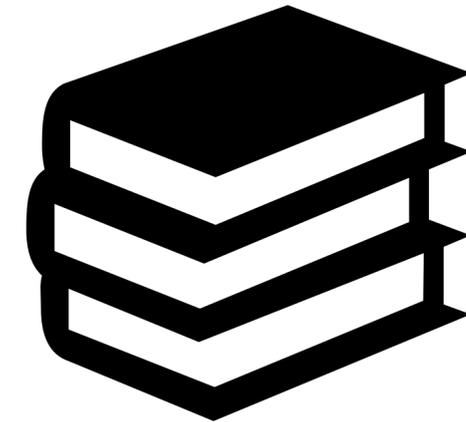
*Data from two webinars not included: 5th Nov (not yet available) and 17th Jun (technical error).



Online e-learning



Podcasts and
videos



Compendium of
fact sheets

Follow up from the Knowledge Series



Poll (2)

What are the most useful follow-up activities or events after this webinar series, for you or your colleagues? (select top three)

- Continue with webinars series
- Podcast and videos of case studies
- Topic-specific checklist and/or guides
- Template tools and data collection/analysis supports
- Online e-learning course
- Advanced masterclasses on selected topics

SEADRIF: Small group discussions

<https://worldbankgroup.webex.com/>

Group A

Matthew Foote

Sally Sfeir-Tait

Meeting number: **172 829 8760**

Meeting password: **GroupANov5**

Group B

Julie Christie Dela Cruz

Lynette Tan

Meeting number: **172 396 6082**

Meeting password: **GroupBNov5**

PLEASE RESPOND TO THE SURVEY TO EARN CERTIFICATION FOR THE COURSE!

Thank you



SEADRIF

**SOUTHEAST ASIA
DISASTER RISK INSURANCE FACILITY**



An ASEAN+3 Initiative
In partnership with The World Bank

Disaster Risk Financing
& Insurance Program

