

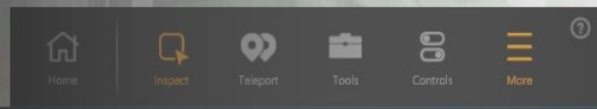
# INDUSTRIAL IMPLEMENTATION OF SMART INSPECTION TECHNOLOGIES

BCA INDUSTRIAL SEMINAR



SOILBUILD'S APPROACH IN

# EMBRACING INNOVATION & TECHNOLOGY





## 01 | SOILBUILD

Since our inception in **1976**, **Soilbuild Construction Group Ltd** has been a leading builder with a **long and successful track record of Industrial, Commercial, Conservation and Private & Public Residential projects.**



# OUR ORGANISATION



SOIL-BUILD  
(PTE.) LTD.

SB  
PROCUREMENT  
PTE. LTD.







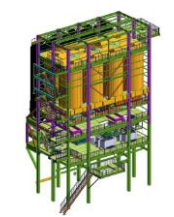
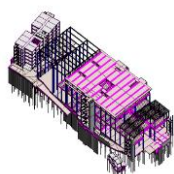
**IDD**

**INTEGRATED  
DIGITAL  
DELIVERY**

**Incorporating Technology in Operations**

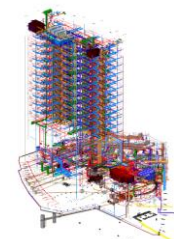
# SOILBUILD - DIGITAL PROGRESSION (VDC - IDD)

2015



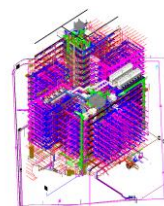
ICPH

2016



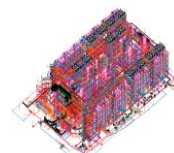
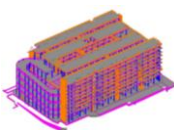
ARC380

2017



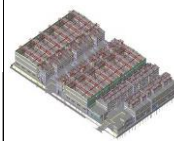
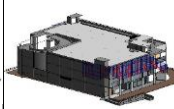
KALLANG WAY

2018



JTC BEDOK FOOD CITY

2019

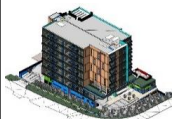


TUAS BAY DRIVE

JALAN LAM HUAT

TUAS BAY CLOSE

2020

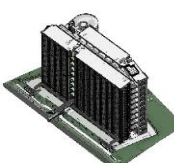
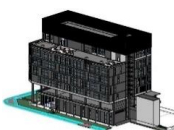


ROSE HILL CONDO

NEW INDUSTRIAL RD

GAMBAS WAY

2021



CORPORATION DRIVE

KALLANG JUNCTION

PIONEER SECTOR 1

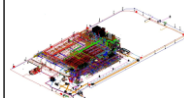
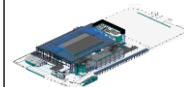
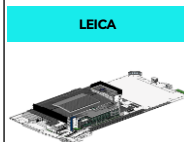
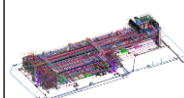
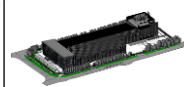
2022



VERTICUS CONDO

SOLARIS @ TAI SENG

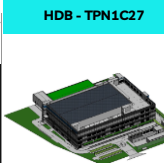
2023



PALL FILTRATION

LEICA

ONGOING



HDB - TPN1C27

SOITEC

NIR-DATA CENTRE

DB SCHENKER RL2





AUTODESK  
CONSTRUCTION  
CLOUD

# DATA CENTRICITY

STAGE 01

ONE-SOURCE-OF-TRUTH

ONE-TOUCH DATA

DATA ACCESSIBILITY





# INTEROPERABILITY

STAGE 02

SEMANTIC INFORMATION EXCHANGE

STANDARDISATION OF PRACTICES

CROSS-PLATFORM & CROSS-ORGANISATION



# AI

STAGE 03

DATA ANALYTICS

DATA FORECASTING

GENERATIVE DESIGN







## INTEGRATED DIGITAL DELIVERY

1. Design Control
2. Construction Management
3. Change Management
4. Seamless Communication
5. Post Construction

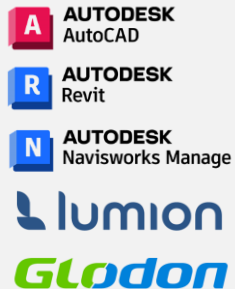
# IDD- COMMON DATA ENVIRONMENT

## COMMON DATA ENVIRONMENT

END USER  
(Facility Management)

### DIGITAL DESIGN

- 3D Shop Drawings
- 4D Simulations
- 5D Quantity Take-off
- Compliance Checks
- Virtual Mock-up & Visualization / VR



### DIGITAL CONSTRUCTION

- ICE Sessions
- 8D -BIM for Safety
- BIM to Field- Safety & Quality Monitoring
- 360 Camera
- Photogrammetry



### DIGITAL FABRICATION

- Progress Monitoring
- Element/Asset Tracking
- DfMA / Precast
- MEP Modularization



### DIGITAL ASSET FM

- 6D Sustainability
- 7D Digital Twin/ Assets Management
- As-Built Capture
- As-Built Handover





# SITE MANAGEMENT PLATFORM

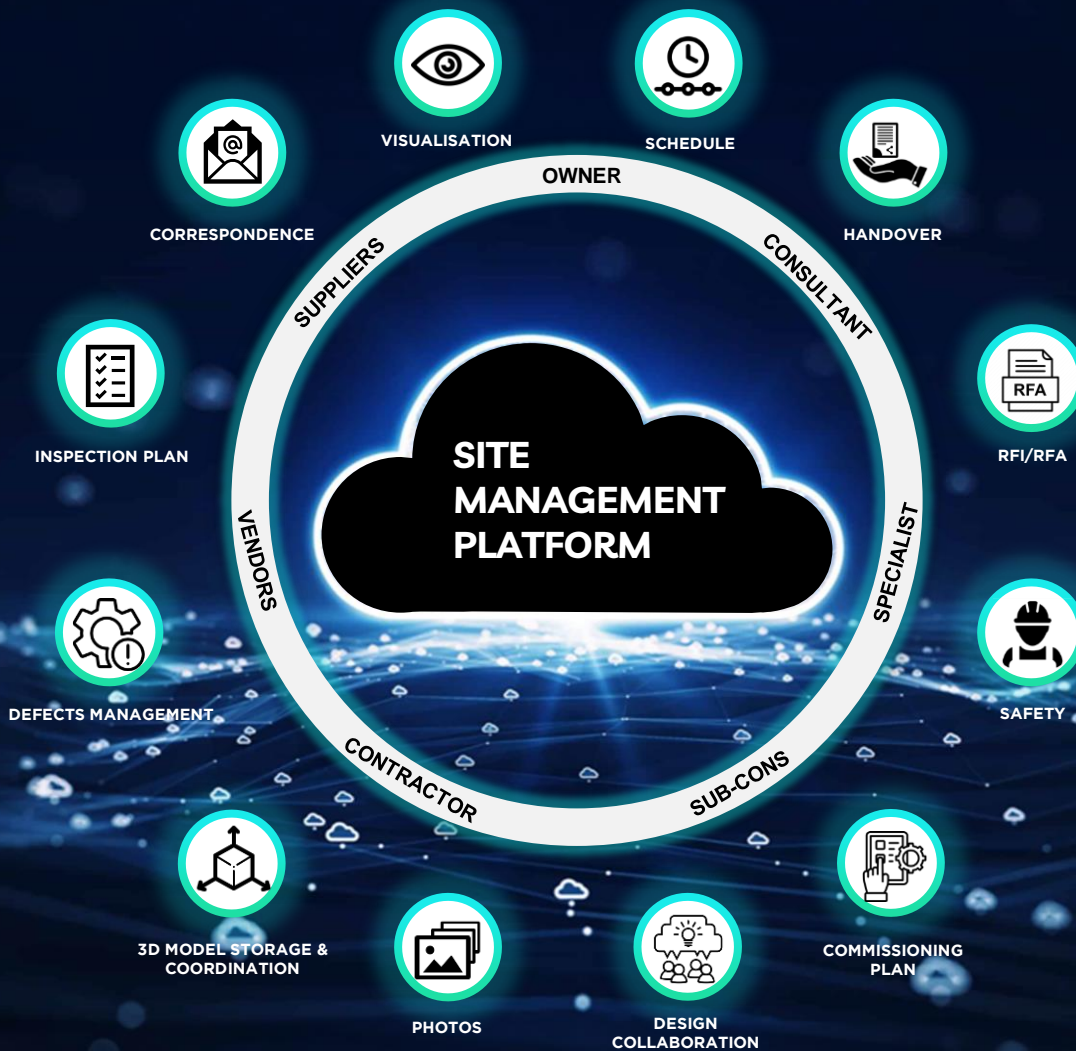


# CENTRALISED SOURCE OF TRUTH

For Overseeing Projects with a COMMON DATA ENVIRONMENT (CDE)



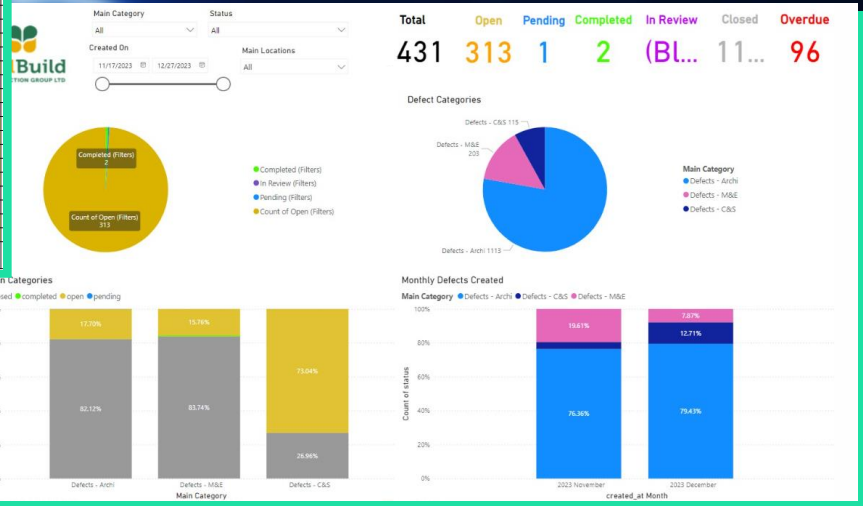
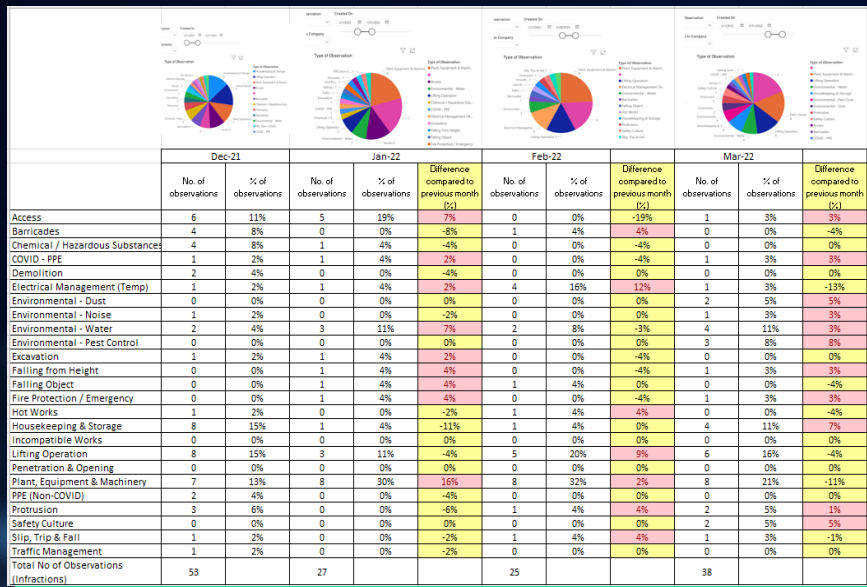
**SITE  
MANAGEMENT  
PLATFORM**





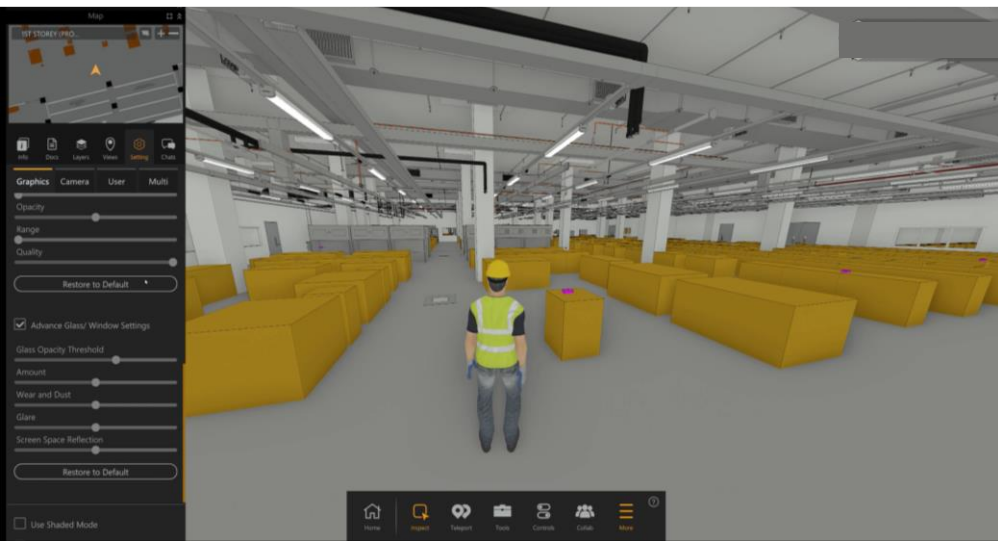


# DIGITALISED FIELD DATA



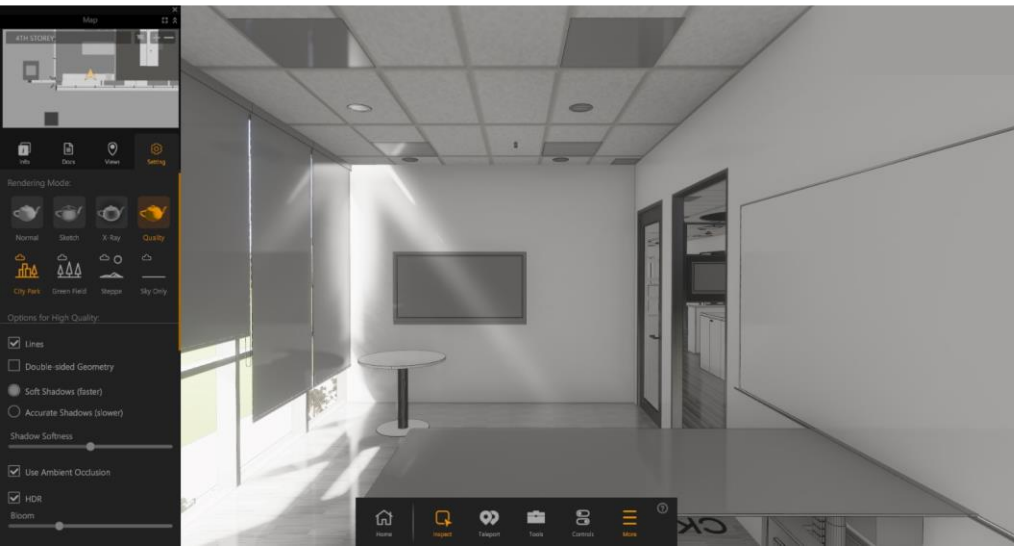
**PERFORM TREND ANALYSIS**  
For safety & quality data





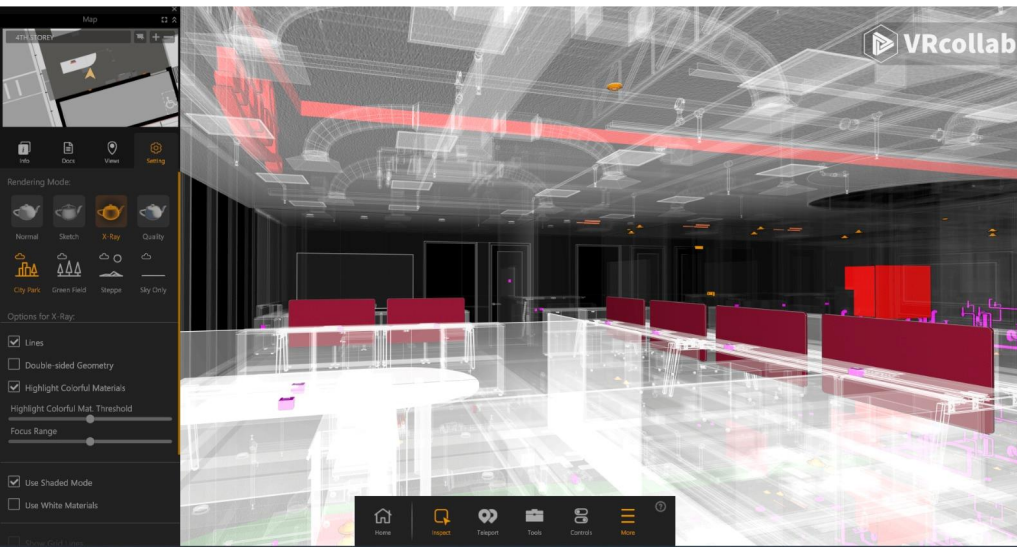
**3D VISUALIZATION VS ACTUAL**

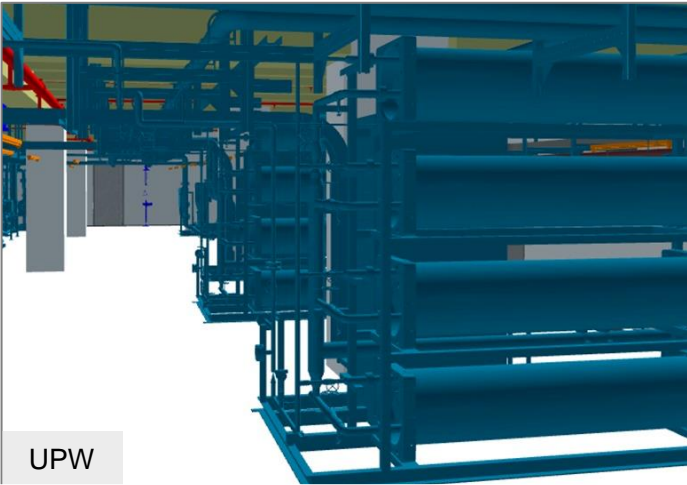




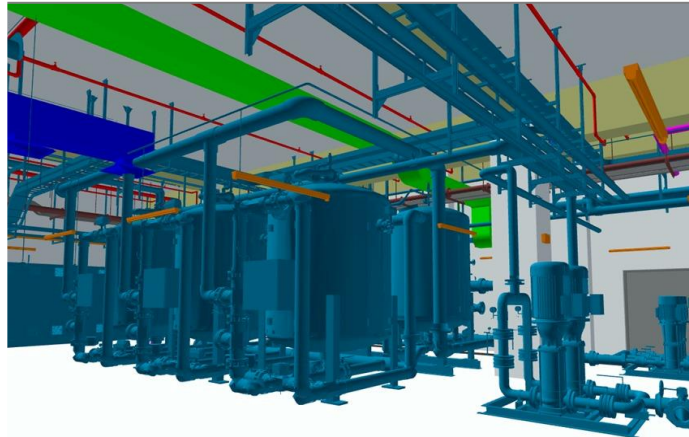
3D VISUALIZATION VS ACTUAL



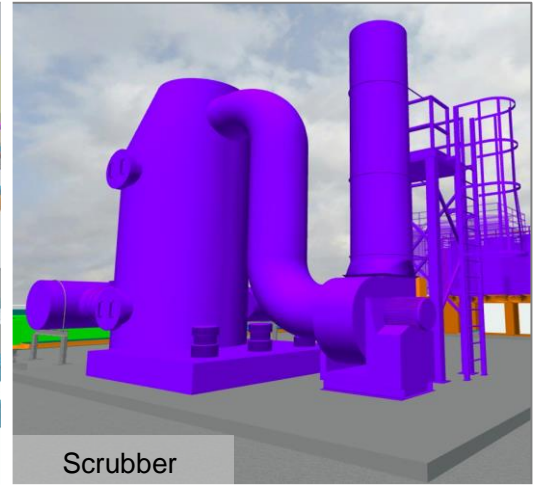




UPW



RODI



Scrubber







## 4D SCHEDULING & VISUALISATION

mo 4  
17/05/2024

FAB L4 beams

SITE OFFICE  
P CARPARK  
ASSEMBLY AREA  
FCM  
RA (16M x 25M)  
MATERIAL STORAGE (30M x 25M)

Loaded 05:28 pm

Save Share

Adjust

Dynamic - Can change over time (11)

Mo 04 FAB L4 beams

Base rotation

0° 360°  
329°

Counter jib length - Multi value

17100 mm 21700 mm  
1710...

Foundation depth

0 mm 15000 mm  
7000 ...

Foundation half width

0 mm 15000 mm  
7000 ...

Hook height

2900 mm 250000 mm  
1440...

Hook location

1400 mm 75000 mm  
2500...

Fit Pan Zoom

Project Setup Excavation Buildings 3D Label Resources & Equipment Presentation and Markup Review

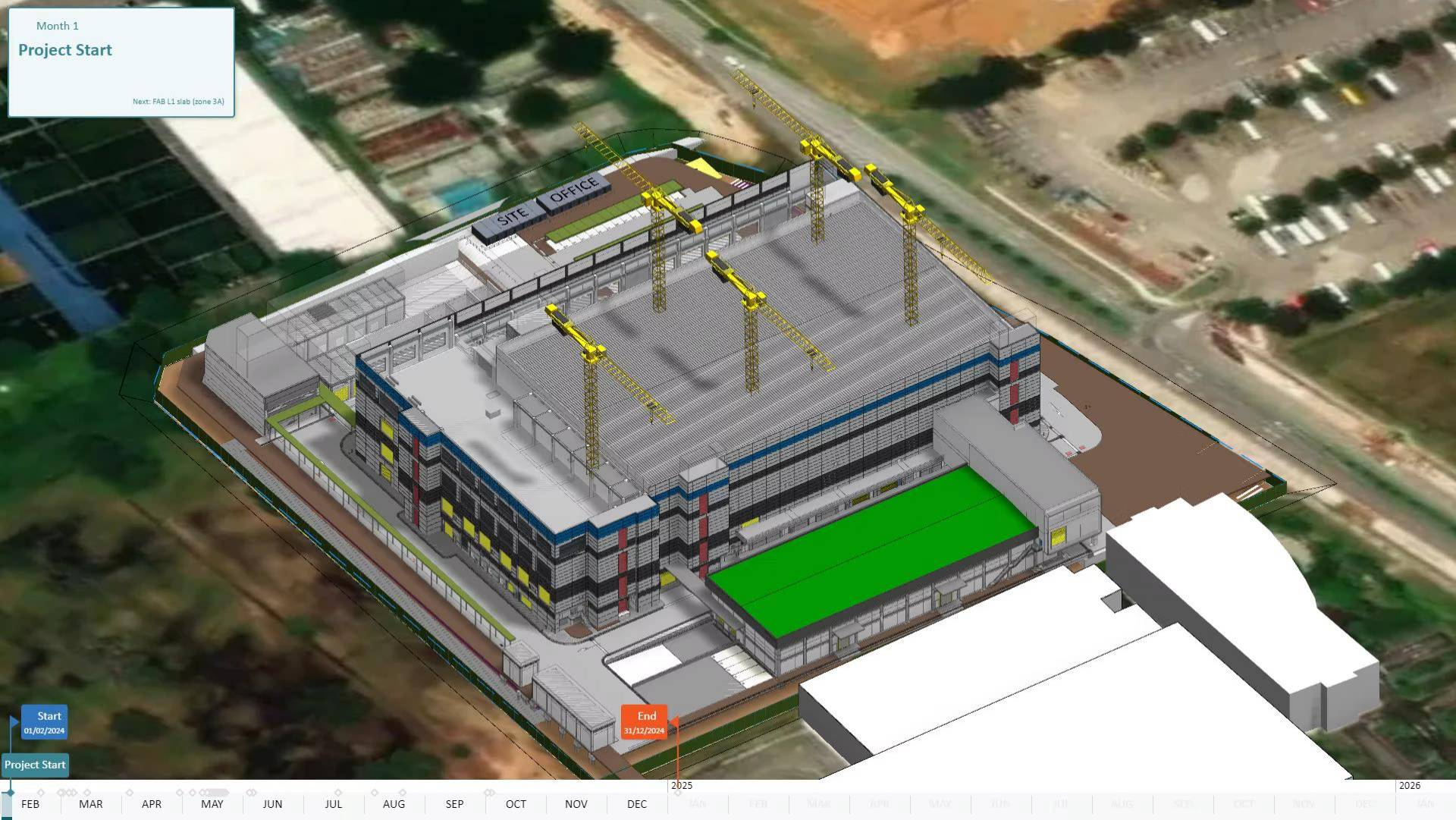
4D SCHEDULING



Month 1

# Project Start

Next: FAB L1 slab (zone 3A)



Start

01/02/2024

End

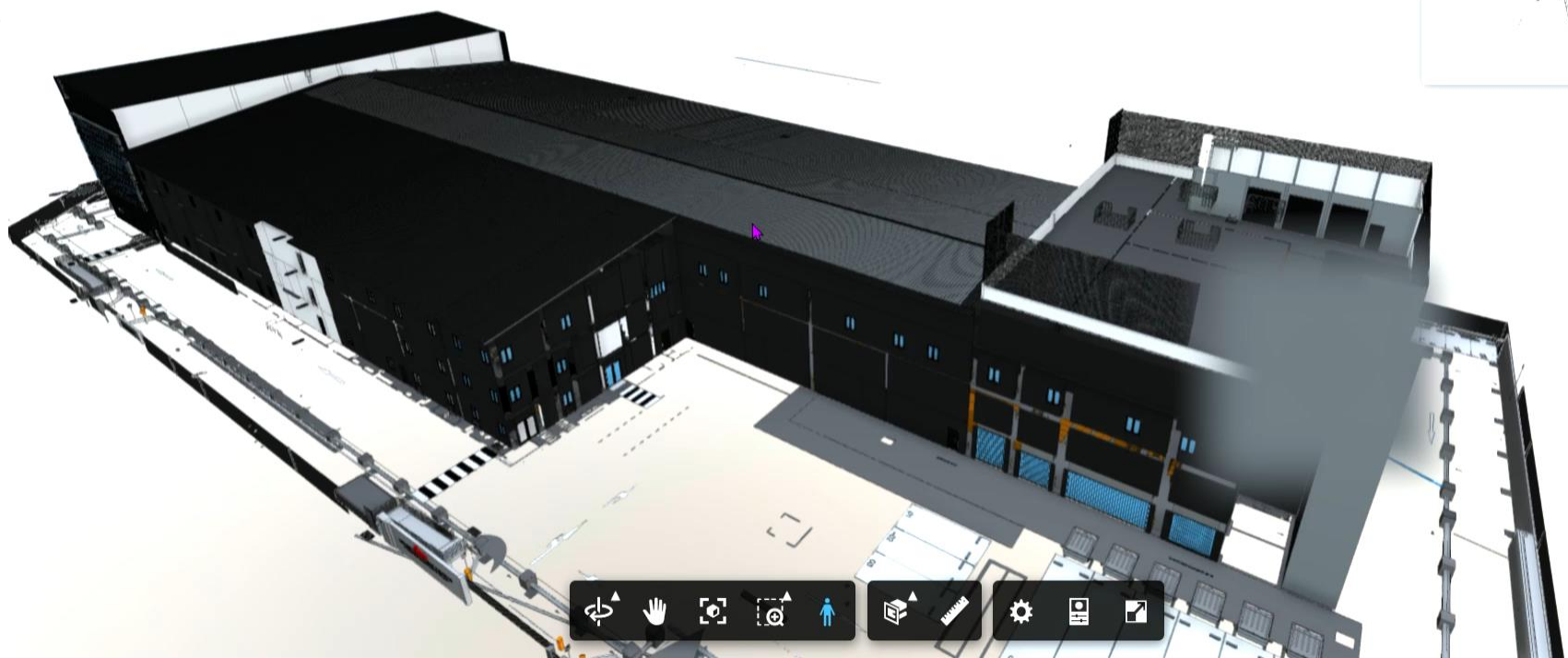
31/12/2024

Project Start











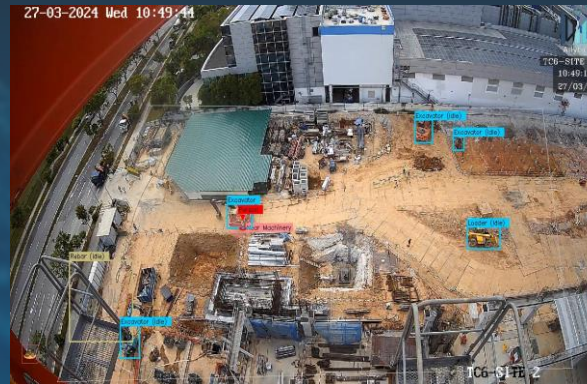
# CONTINUOUS IMPROVEMENT INITIATIVES

## AI CCTV ANALYTICS

### AI Equipped CCTV Cameras

Adding to higher visibility, AI CCTV Cameras will Alert WSHO whenever worker are in hazardous situations.

WSHO is able to **detect Safety Breaches swiftly** and is able to make executive decisions on how to address the situation.





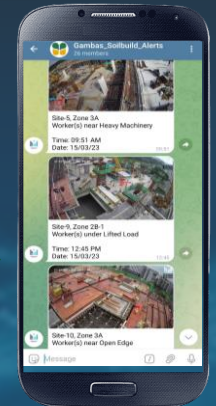
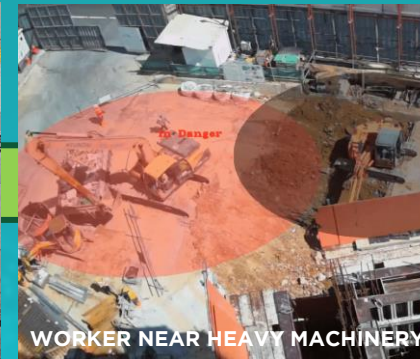
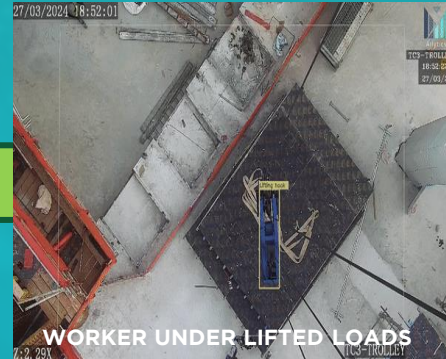
# SAFETY MONITORING DEVICES

## Crane Lifting Control & AI Risk Detection Measures



### Crane Camera w/ Viewing Monitor

Enhance visibility of operator in cabin, avoid blind spots & allow checking of crane condition.



Site notification  
via Telegram App

# Single-source-of-truth at your fingertips



## Virtual Site

### 360° Virtual Progress

- improved report efficiency
- clear meeting communication
- faster decision making
- critical progress management
- 100% site progress monitoring



Daily / Weekly Progress Meetings



Monthly Client / HQ Reports



Remote Progress Monitoring



Multiple Trades Supervision



HQ / Multiple Sites Monitoring



## Time Capsule

### 100% Progress Evidence

- accurate claims payment
- objective dispute resolution
- evidence for VO claims
- traceable site situation
- layered, 100% documentation



Progress Claims Verification



Delay & Disputes Management



Abortive VO Evidence



Final Accounting / Handover / DLP



As-built / As-Is Documentation



## 360° progress dashboard, single-source-of-truth to resolve disputes & VO

## Markup observations in 360° virtual space, clearly locate and resolve issues

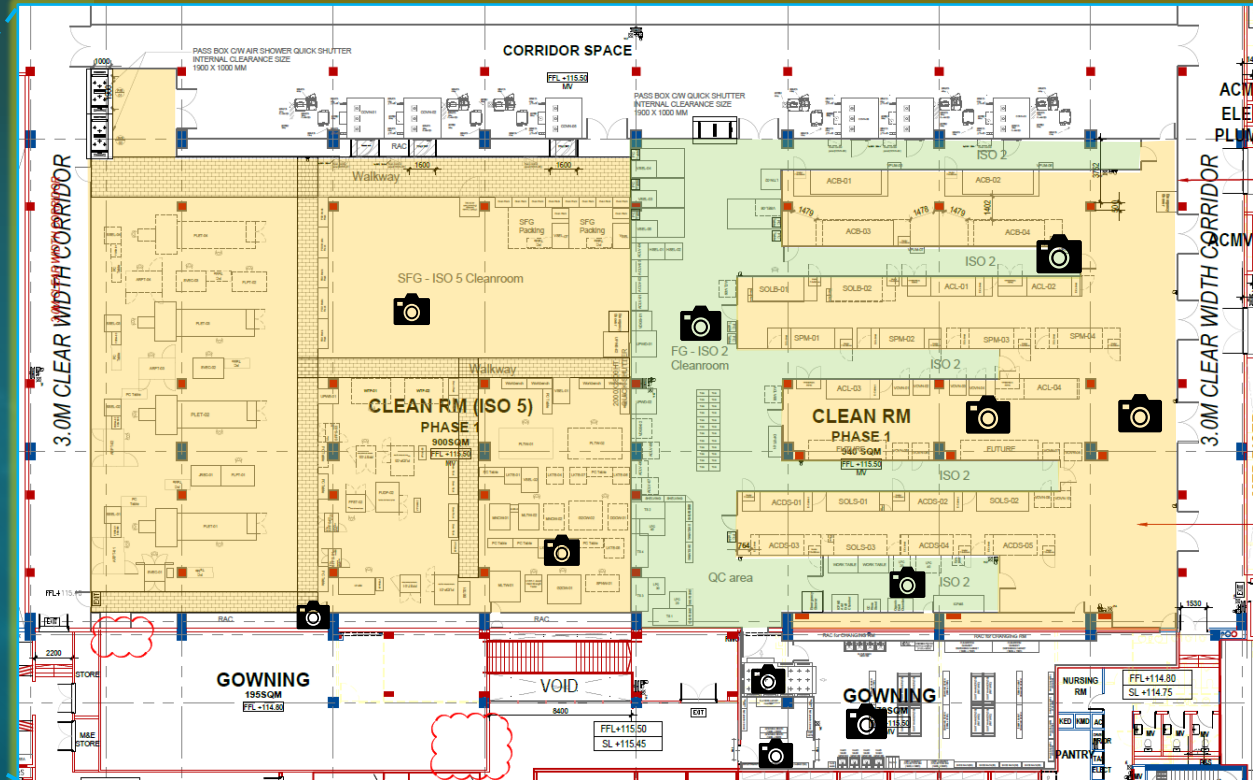
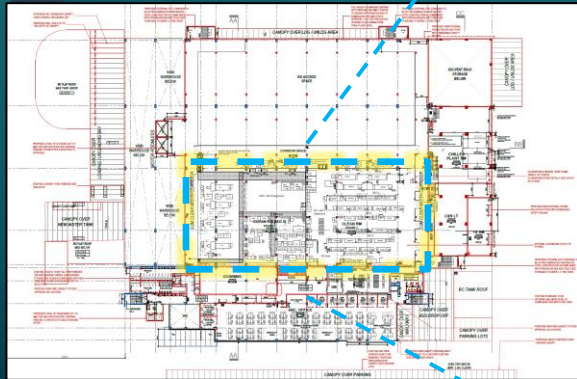
## Lite issue management dashboard, integrate-able with your CDE/PM software

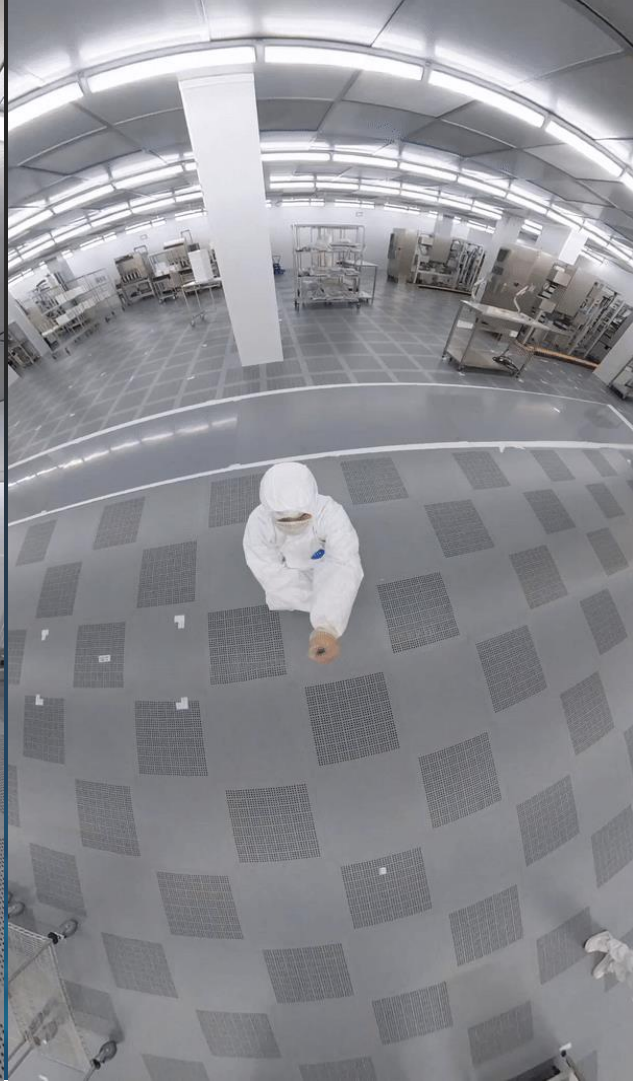
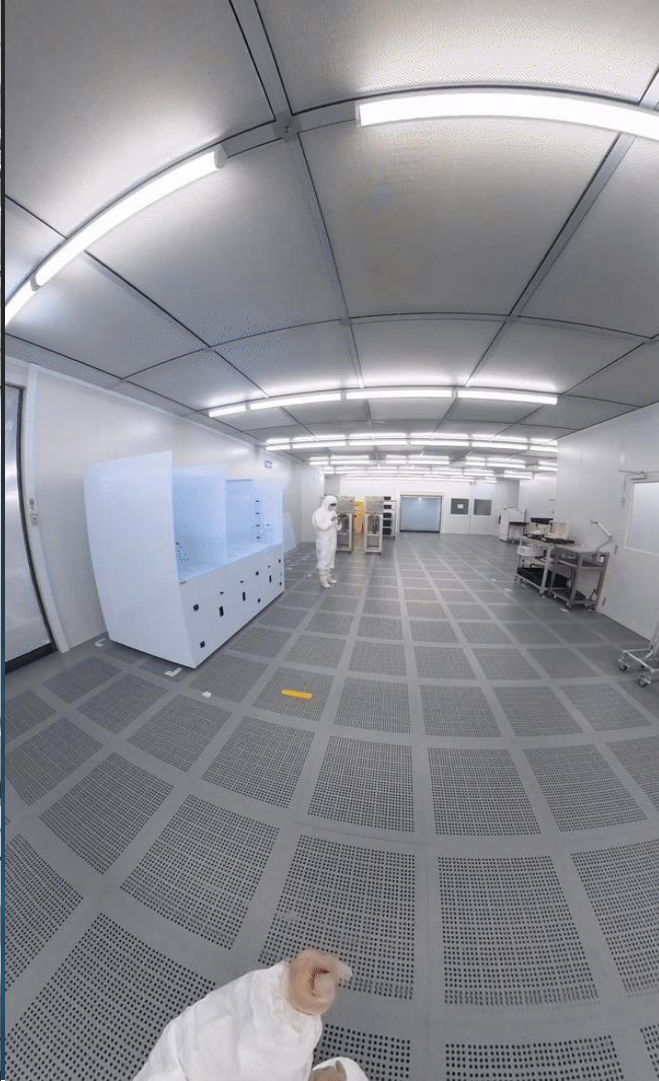
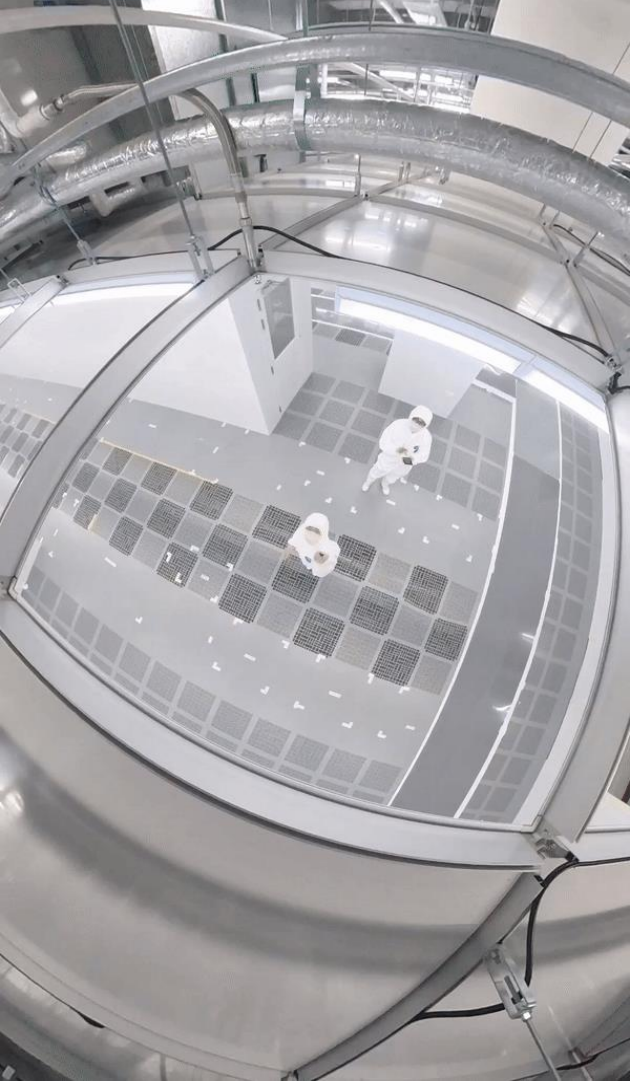
#	Title	Sheet	Status	Severity	Category	Created Date	Updated Date	Due Date	Author
20	@ balcony		open	Medium	interior and exterior	2022-04-14	2022-04-14	2022-04-19	com.sg
21	@ glass rail infill/curtain		open	Medium	Access	2022-04-14	2022-04-14	2022-04-19	com.sg
22	@ Turret		open	Low	Housekeeping	2022-04-14	2022-04-21	2022-04-21	com.sg
24	@ Air pollution		open	Low	Housekeeping	2022-02-09	2022-02-11	2022-02-16	com.sg
25	@ 10' atrium		open	Low	Stagnant water	2022-02-09	2022-02-11	2022-02-16	com.sg
26	@ stagnant water		open	Low	Stagnant water	2022-02-09	2022-02-11	2022-02-16	com.sg
28	@ stagnant water		open	Medium	Stagnant water	2022-02-09	2022-02-11	2022-02-16	com.sg
21	@ mesh/lyft/door		open	Medium	Working Platform	2022-02-09	2022-02-09	2022-02-10	com.sg
22	@ single vertical platform		open	Medium	work at height	2022-02-09	2022-02-09	2022-02-10	com.sg
14	@ Warning barricade		open	Medium	baricade	2022-01-27	2022-02-01	2022-01-30	com.sg
17	@ Skirt/RAI		open	Medium	work at height	2022-01-27	2022-02-01	2022-01-30	com.sg
12	@ Housekeeping		open	Medium	Housekeeping	2022-01-27	2022-02-01	2022-01-30	com.sg
18	@ 07 door		open	Medium	CDM issue	2022-01-27	2022-02-01	2022-02-02	com.sg

## 1-click progress evidence report, 360° communication of progress



# 360 Cameras For Site Management



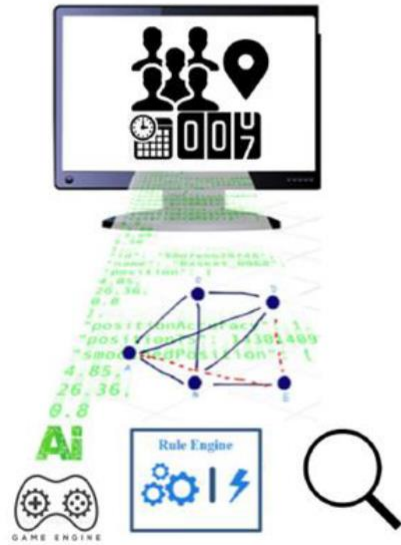




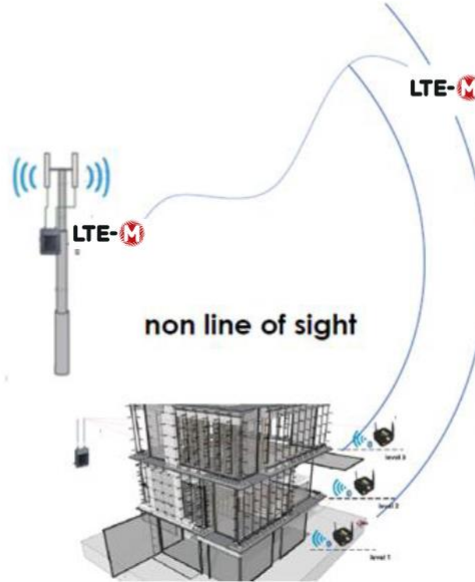
# WORKFORCE TRACKING SYSTEM

## REAL-TIME LOCATION & HEADCOUNTS

Office



Work Site



Workforce





Map

1ST STOREY (OFFL...

Info Docs Layers Views **Setting** Chats

Graphics Camera **User** Multi

User Name:  
**SOILBUILD**

User Height (Desktop):  
183 cm

Multi User Color

Walk Mode (Desktop)

Walk Mode (VR User)

Open Doors in Fly mode

Unit of Measurement

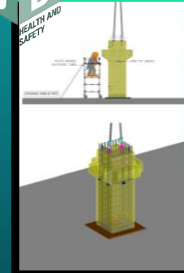
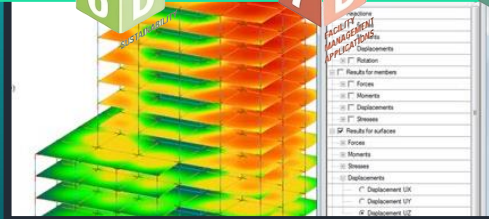
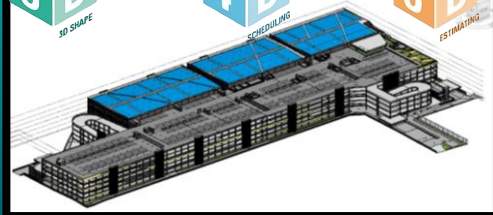
Use Metric System

Use Imperial System



Home Inspect Teleport Tools Controls Collab More

# BIM DIMENSIONS



DATA WAREHOUSE

(PHYSICAL / VISUAL  
COMMAND CENTER)

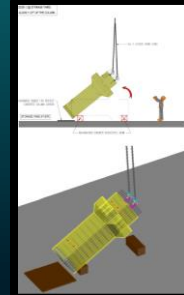
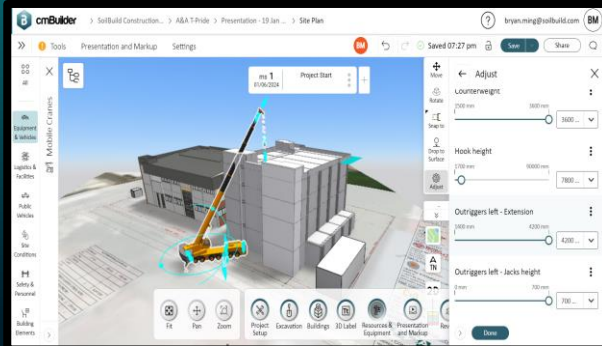
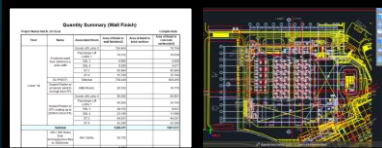
DATA ANALYTICS



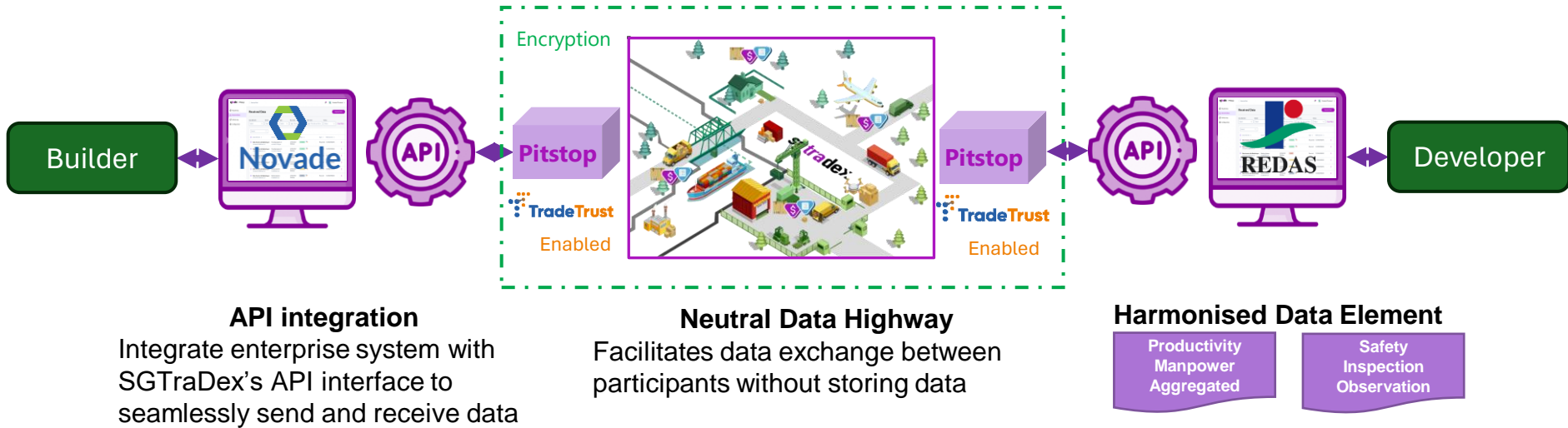
USE OF HISTORICAL DATA FOR PLANNING ON SITE

DATA-DRIVEN SOLUTION GENERATION

RESOURCE OPTIMISATION



*A neutral data highway can contribute to effective and secure data exchange, via single connectivity and common data standard, across different systems leading to data-driven decision making for better project outcomes"*







# STAGES OF IMPLEMENTATION

# Stages of Implementation



## Vision Stage

- Optimism and Excitement
- Planning and Strategy
- Configuration and Testing
- Team Mobilization
- Rollout Begins
- .



## Freakout Stage

- Doubt and Uncertainty
- Technical Hurdles
- Resistance to Change
- Training gaps
- Deadlines do not change
- Loss of Vision

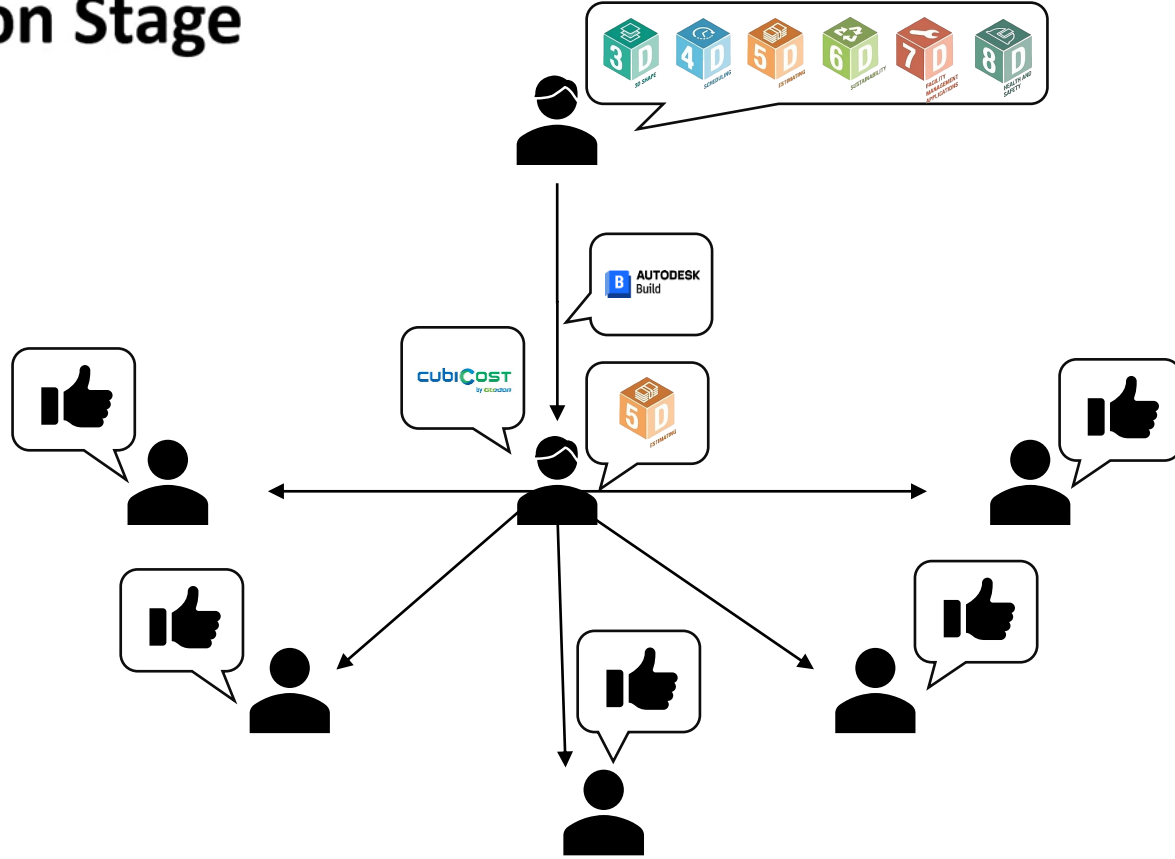


## Comfort Zone Stage

- Familiarity and Routine
- Optimized Processes
- Continuous Improvement



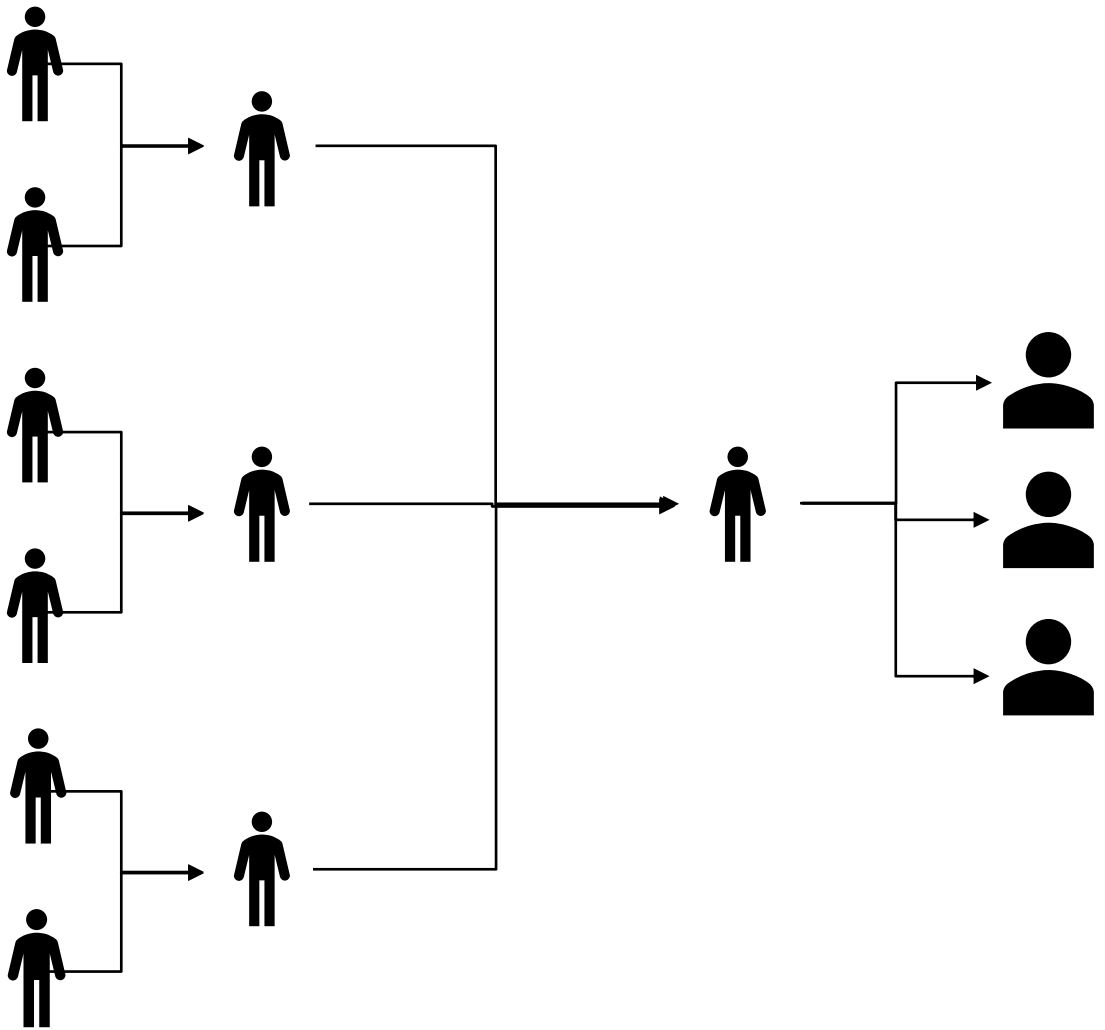
# Vision Stage





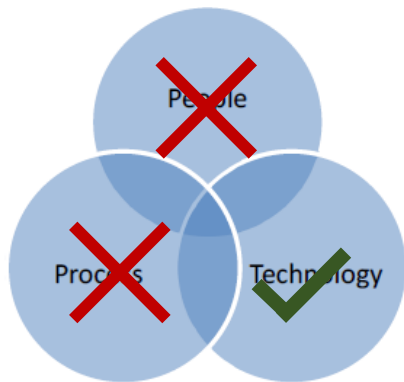


# Vision Stage

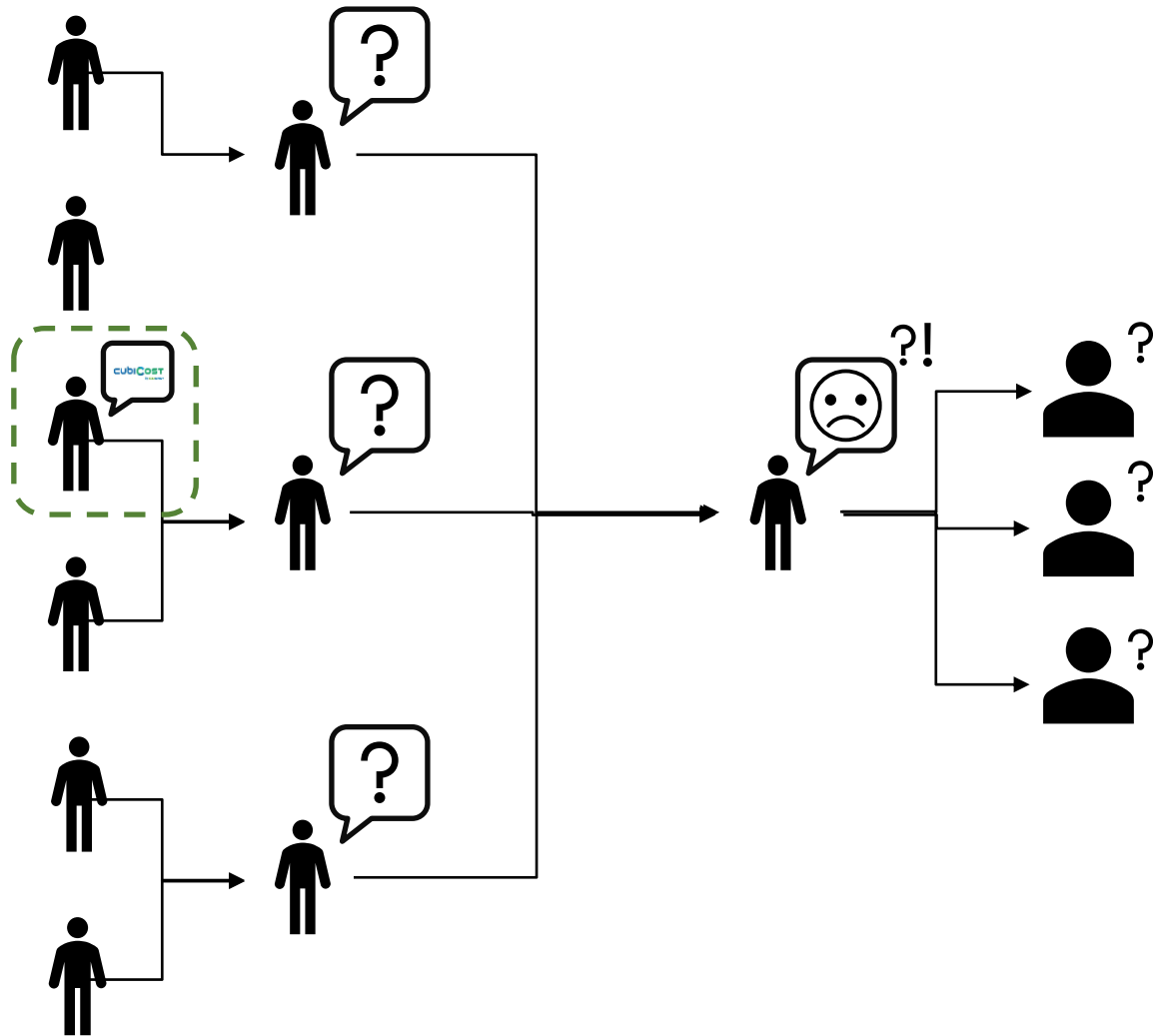




# Freakout Stage

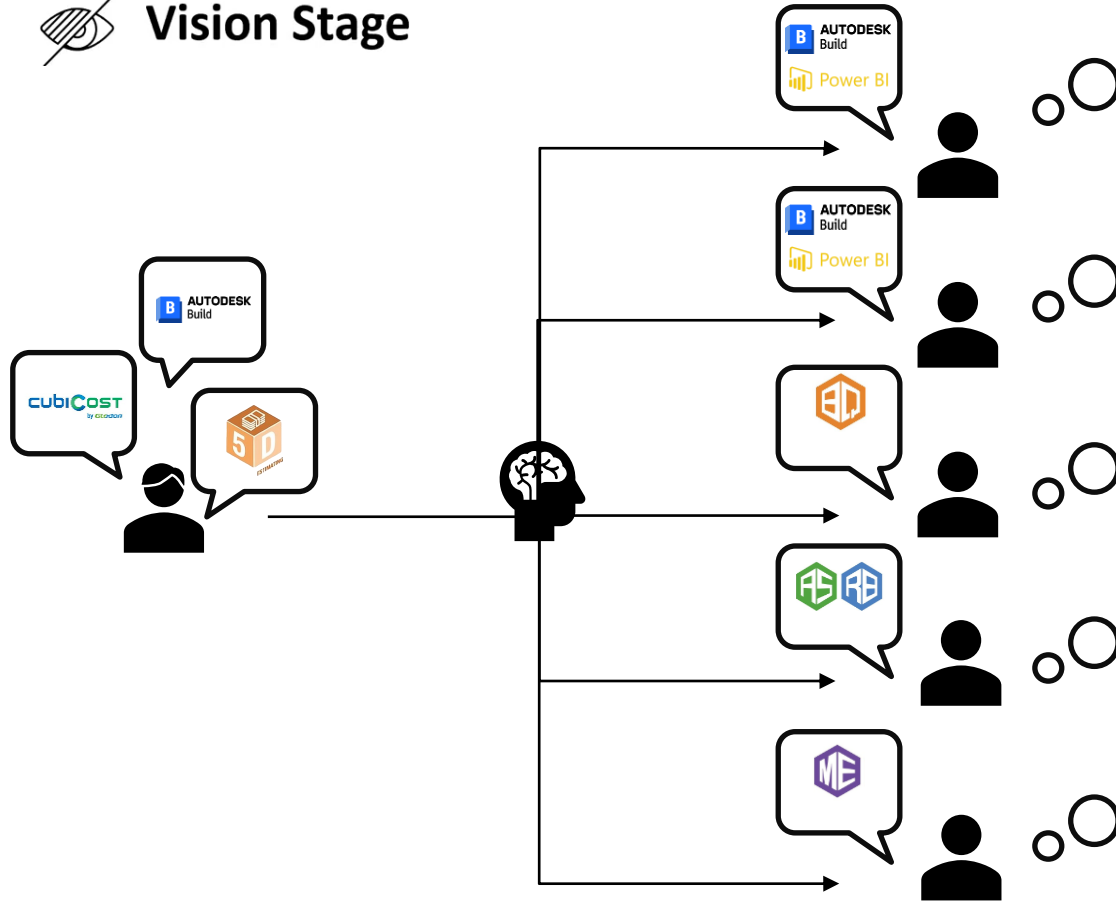


- Doubt and Uncertainty
- Technical Hurdles
- Resistance to Change
- Training gaps
- Deadlines do not change
- Loss of Vision





# Vision Stage



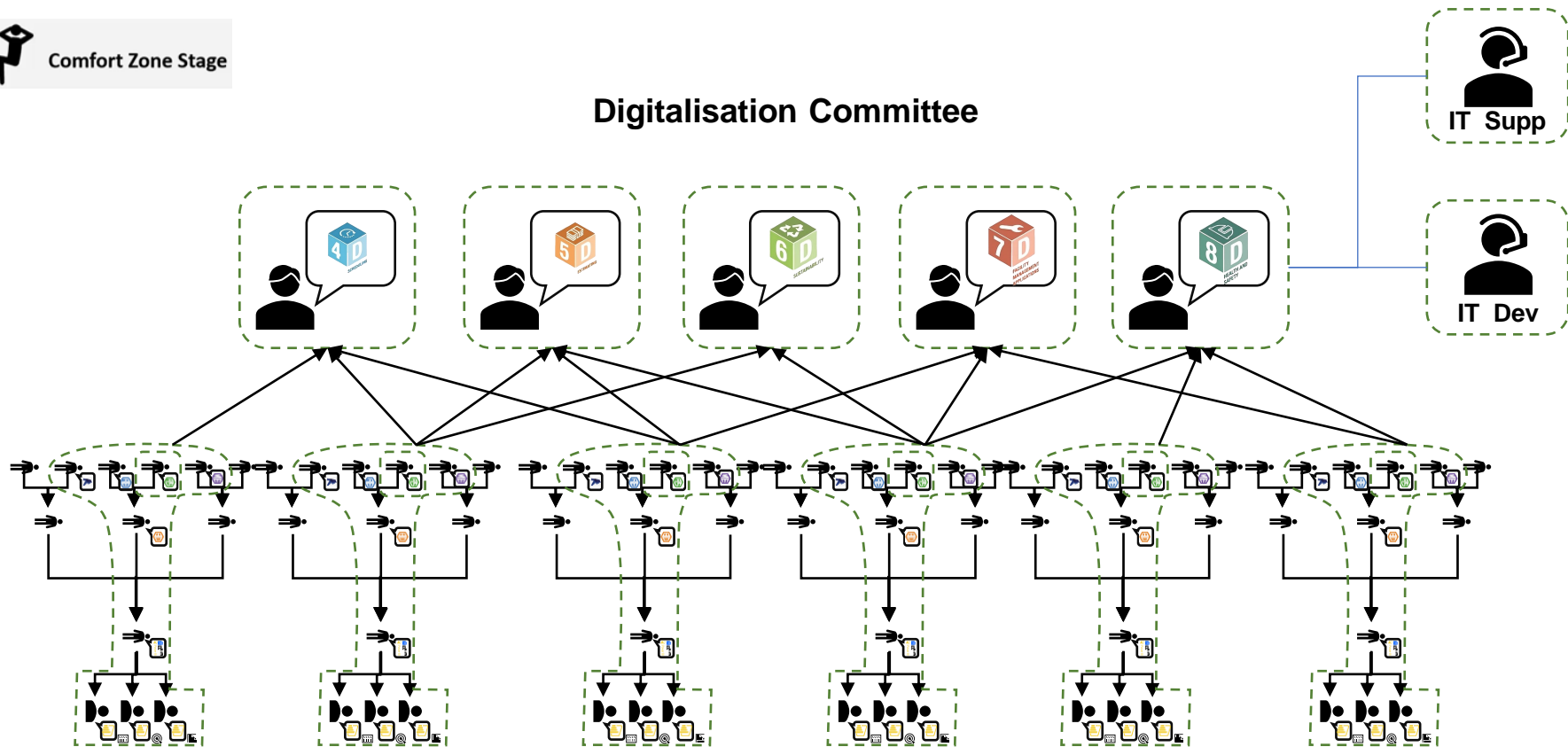
- **Makes Announcements**
  - i. Distribute organization-wide announcements about the implementation.
  - ii. Educate Stakeholders about the implementation process (and to anticipate the “Freakout”; it is natural & being prepared will help)
- **Engage Stakeholders**
  - i. Make clear everyone who is along the supply chain is accountable for the implementation (Management to End-users)
- **Clear Documentation Requirements**
- **Establish Clear Milestones**
  - i. Set Data Goal, Standards and Metrics that will serve as a roadmap & give assessment criteria. The more detailed SOPs and Reqs are the more people know what they have to deliver.
- **Develop Drivers & Champions**
  - i. Make clear who leads the implementation journey (Driver) and who will attempt the technical execution (Champions).





Comfort Zone Stage

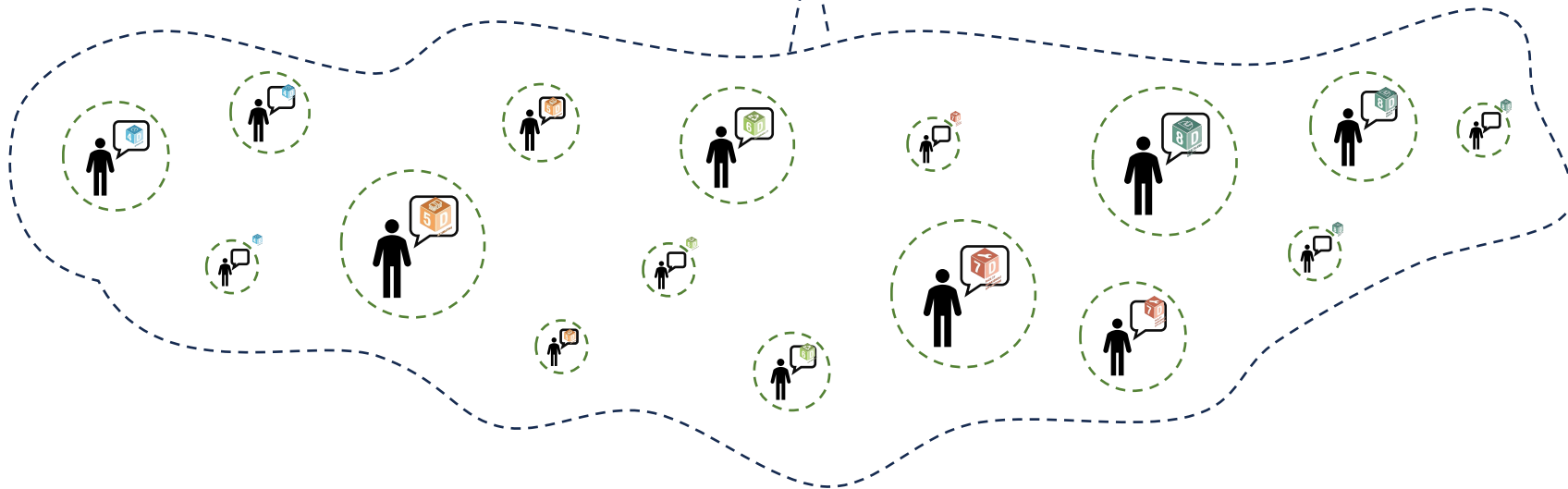
## Digitalisation Committee





Comfort Zone Stage

## Digitalisation Committee



# IMPLEMENTATION CLINIC

Collaborating with Internal Champions & External Consultants



**QUARTERLY**

**MANAGEMENT LEVEL**

**Overview  
Navigation  
Basics  
Etc.**



**MONTHLY**

**MIDDLE  
MANAGEMENT LEVEL**

**Review  
Workflows  
Technical  
Etc.**



**WEEKLY**

**OPERATIONAL LEVEL**

**Full Platform Knowledge  
Identify User Champions at  
Operational Level For Future  
Trainings**





# THANK YOU

Presented by:  **SoilBuild**  
CONSTRUCTION GROUP LTD

*Disclaimer: Images used in this presentation are solely for presentation & illustration purposes only.*