

| 20161006 HKIBIM EMSD

Background

- ▶ EMSD

- Over 4,000 staff

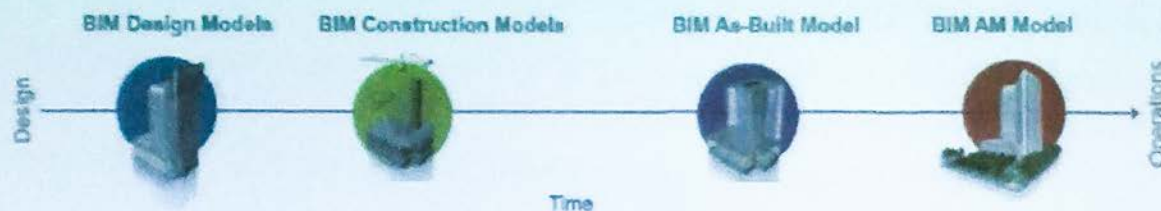
- ▶ Operate & maintain over 5,000:

- Government and Municipal buildings;
 - Hospitals etc.

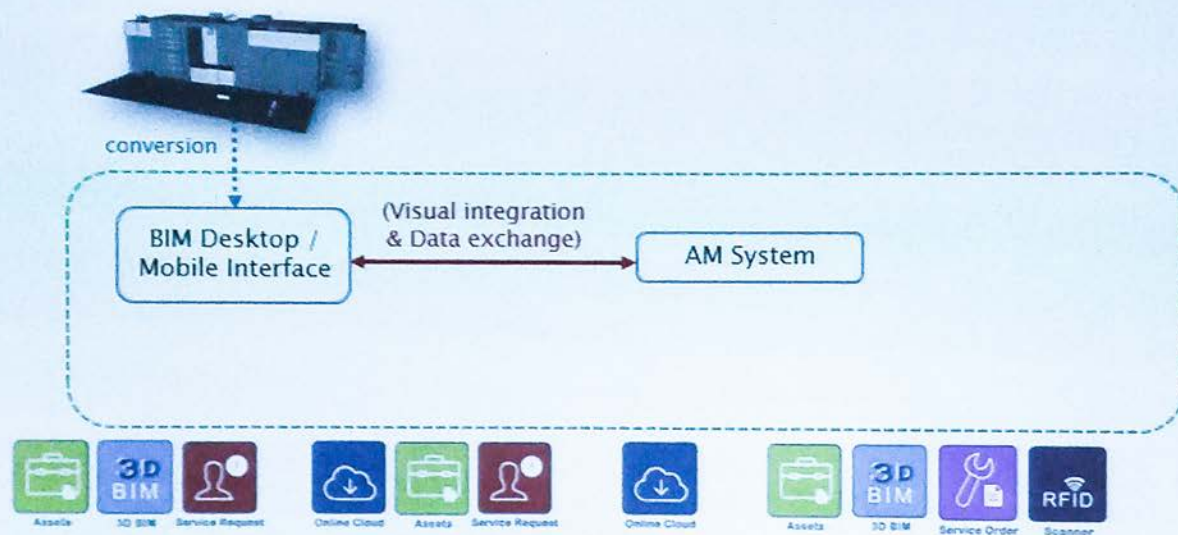


► What are the potential benefits of applying BIM to:

- asset management (AM)
- building operation & maintenance (O&M)

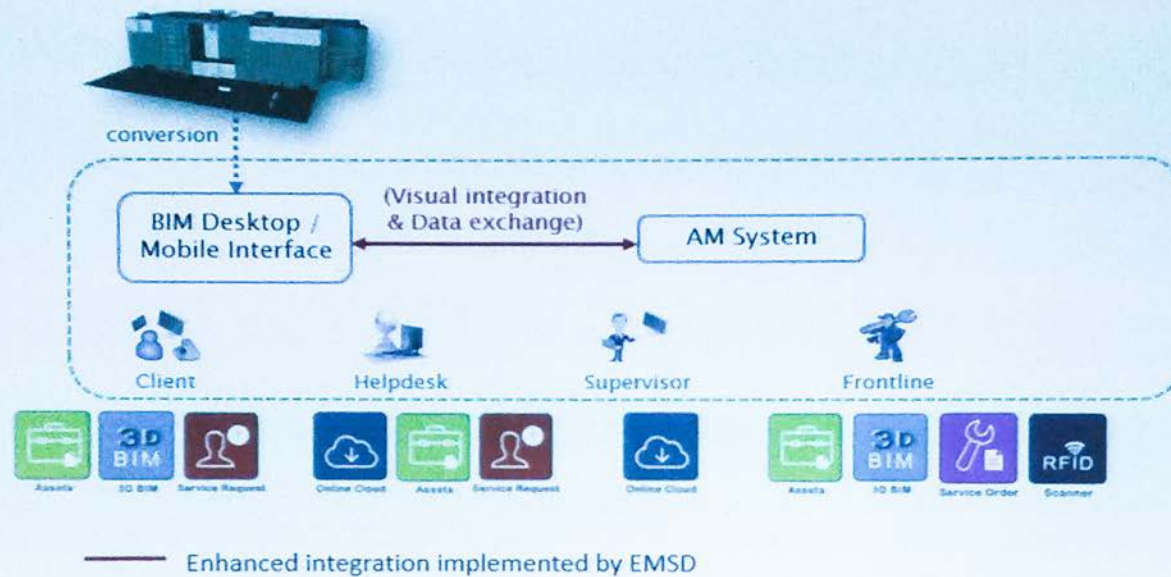


Architecture for EMSD BIM-AM System



— Enhanced integration implemented by EMSD

Architecture for EMSD BIM-AM System



Outline

- ▶ EMSD BIM-AM System
 - Retrospective BIM model construction
 - System architecture illustrated by showcases
 - HVAC showcase (1.fault reporting, 2.pre-diagnosis, 3.on-site repairing)
- ▶ Way forward



HVAC Showcase – Fault Reporting



Suppose the Client feels the Lecture Theatre is a bit hot despite having adjusted the air-conditioning to a lower temperature. She suspects something wrong with the air-conditioning system.

HVAC Showcase – Fault Reporting

The screenshot displays the BIM-AM System interface. At the top, it says "BIM-AM System" with a clock icon and ": 00:00". On the right side, there is a vertical list of user roles with corresponding icons: Client, Helpdesk, Supervisor, and Frontline. The main area shows a video feed of a hall with red seats and a woman standing. On the left, there is a section titled "Service Request by Phone" with a clock icon and ": 00:00". Below this, there is a smaller video feed labeled "Current Practices" showing a person in a hallway. At the bottom right, there is a text box that reads: "As the building is already operated and maintained with BIM-AM system, the Client simply logs onto BIM-AM on her tablet."

HVAC Showcase – Fault Reporting

The screenshot displays the BIM-AM System interface. At the top left, it says "BIM-AM System" with a clock icon and ": 00:00". On the right side, there is a vertical stack of user avatars labeled "Client", "Helpdesk", "Supervisor", and "Frontline". The main area shows a "Service Request" form with fields for "Requester ID", "Point Description", "Status", and "Fault Type". A hand is shown interacting with the tablet. In the bottom left corner, there is a small inset video labeled "Current Practices" showing a call center environment, with the text "Service Request by Phone" and a clock icon above it. Below the main interface, a caption reads: "clicks open 'Service Request' to type in or input by voice the details of the fault. Alternatively, if she does not have her tablet handy."

HVAC Showcase – Fault Reporting

BIM-AM System

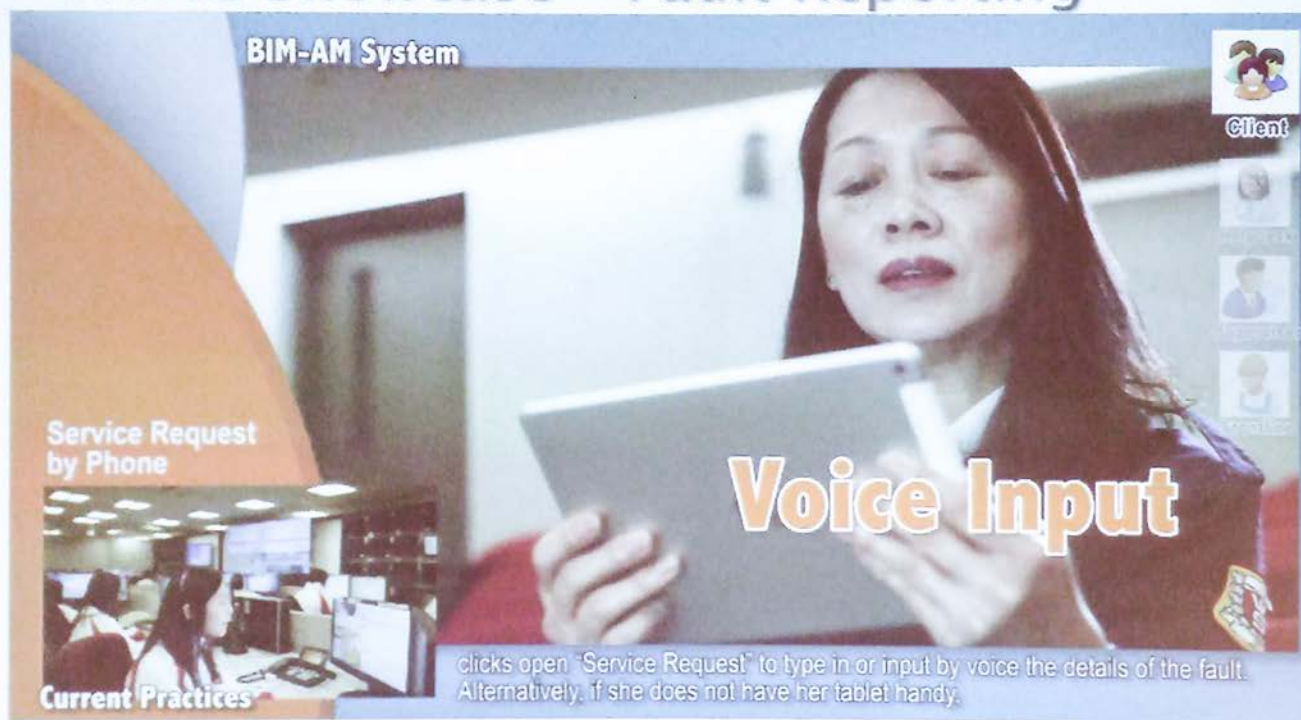
Service Request by Phone

Current Practices

Voice Input

clicks open "Service Request" to type in or input by voice the details of the fault. Alternatively, if she does not have her tablet handy,

Client

A woman with long dark hair is holding a tablet and looking at it. Overlaid on the image is a software interface for the BIM-AM System. The interface includes a title bar 'BIM-AM System', a sidebar menu with 'Service Request by Phone' and 'Current Practices', a large central text 'Voice Input', and a bottom section with a description of the service request process. On the right side of the interface, there is a vertical list of user avatars, with the top one labeled 'Client'.

HVAC Showcase – Fault Reporting

BIM-AM System

Equipment ID*
Asset Description
Comment

Fault Type
System Type
Priority

Service Request by Phone

01 Very Urgent (Immediate)
02 Urgent (Within 4 hours)
Normal (Within 6 hours)

Client
Helpdesk
Supervisor
Frontline

Current Practices

she may also call the Helpdesk to report the fault verbally. The Helpdesk will log her service request onto the BIM-AM system.

HVAC Showcase – Fault Reporting

BIM-AM System

Append Photo

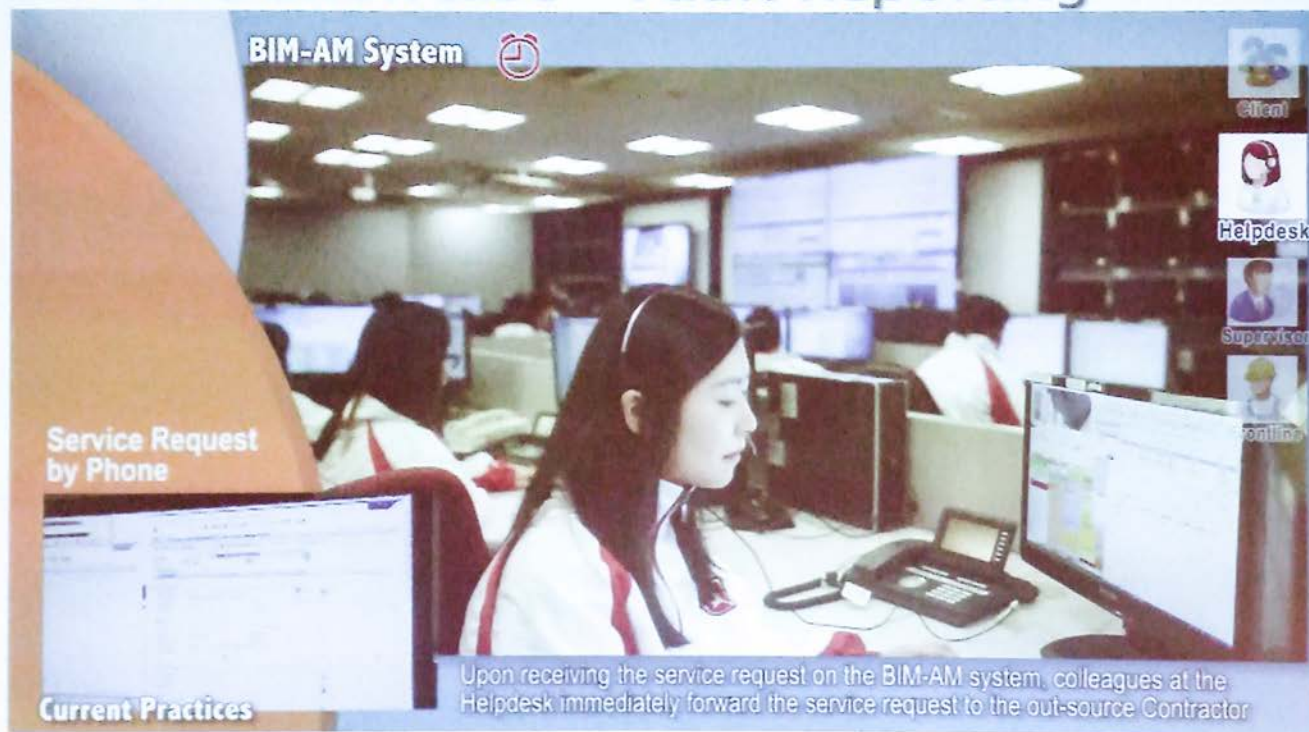
Service Request by Phone

Current Practices

The Client can also append a photo from album or camera to the system. The BIM-AM system will take care of the rest. Client submits her service request.



HVAC Showcase – Fault Reporting



HVAC Showcase – Fault Reporting

BIM-AM System 🕒 00:10

No filter

Adc =

General Health & Safety Helpdesk

General

iOS Temp ID

* Number

Standard order

* Description

* System Type

Fault Type

Priority

Orders

- 2936.00, 演講廳有點熱
- 2935.00, Parts replaced
- 2934.00, Parts replaced
- 2933.00, Jammed by rubbish
- 2932.00, Jammed by rubbish
- 2931.00, AHU-7-6 - AHU-7-6
- 2930.00, Parts replaced

Service Request by Phone

Current Practices

Upon receiving the service request on the BIM-AM system, colleagues at the Helpdesk immediately forward the service request to the out-source Contractor

HVAC Showcase – Fault Reporting

Service Request by Phone

Upon receiving the service request on the BIM-AM system, colleagues at the Helpdesk immediately forward the service request to the out-source Contractor

HVAC Showcase – Fault Reporting

Service Request by Phone

Current Practices

BIM-AM System

Space

Equipment

Location

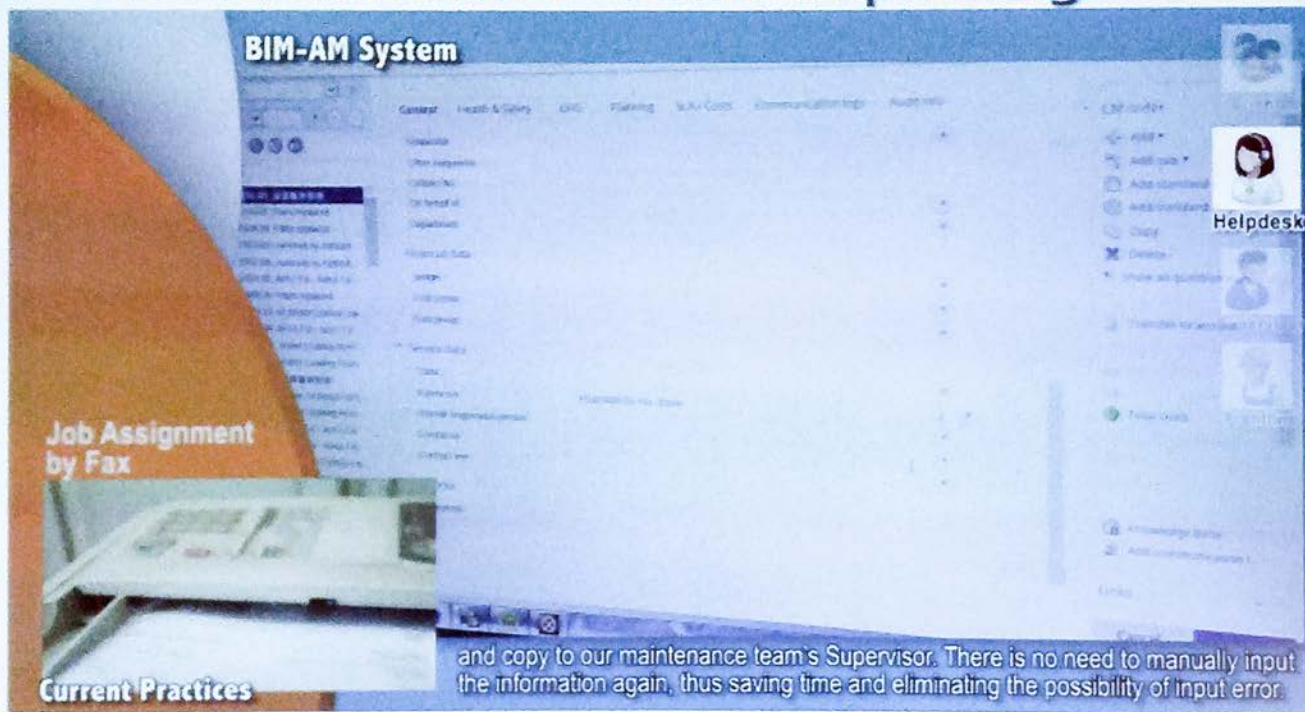
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1003	1003	1003	1003
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1199	1199	1199	1199
1200	1200	1200	1200

OK Cancel

and copy to our maintenance team's Supervisor. There is no need to manually input the information again, thus saving time and eliminating the possibility of input error.

HVAC Showcase – Fault Reporting

BIM-AM System



Job Assignment by Fax

Current Practices

and copy to our maintenance team's Supervisor. There is no need to manually input the information again, thus saving time and eliminating the possibility of input error.

HVAC Showcase – Fault Reporting

BIM-AM System

00:15
Job Assignment by Fax

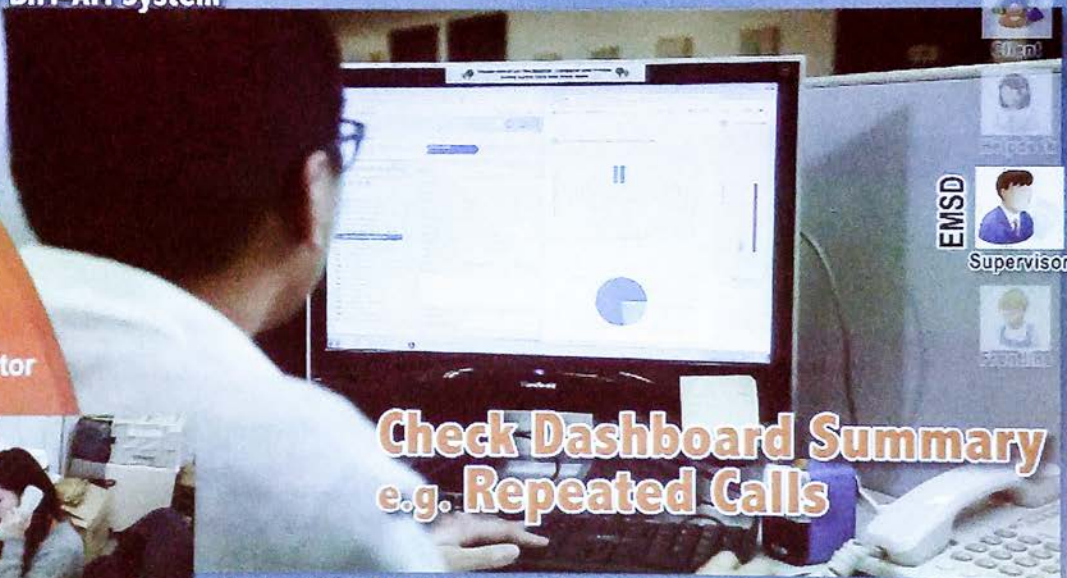
Current Practices

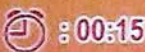
and copy to our maintenance team's Supervisor. There is no need to manually input the information again, thus saving time and eliminating the possibility of input error.

Helpdesk

HVAC Showcase – Fault Reporting

BIM-AM System



 : 00:15

Inform Contractor by Phone

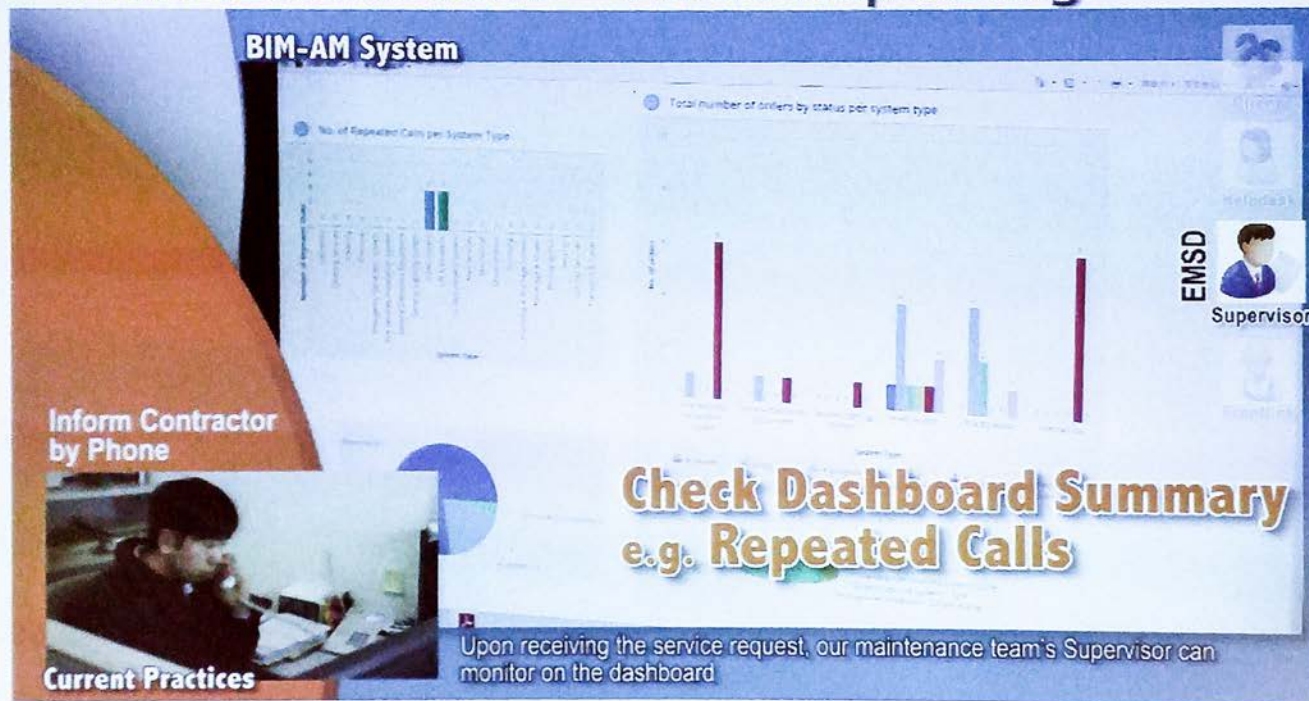


Current Practices

**Check Dashboard Summary
e.g. Repeated Calls**

Upon receiving the service request, our maintenance team's Supervisor can monitor on the dashboard

HVAC Showcase – Fault Reporting



HVAC Showcase – Fault Reporting

BIM-AM System

new

Syst...

Orders

- ★ 2898.00, AHU-7-6 - AHU-7-6
- ★ 2898.00, AHU-7-6 - AHU-7-6 and...
- ★ 2896.00, 實請其有點點
- ★ 2895.00, One exit sign is off
- ★ 2894.00, Water leaking from sprinkler h...
- ★ 2893.00, 2 floodlights are off
- ★ 2883.00, AHU-7-6 - AHU-7-6
- ★ 2882.00, Camera-Security-Panasonic-
- ★ 2881.00, AHU-7-6 - AHU-7-6

Contractor Supervisor

Generat...

IOS Ver...

Helpdesk

System

Frontline

Fault Type

Priority

Sign off n...

Project it...

Current Practices

At the same time, the Contractor's Supervisor uses the BIM-AM system to instruct and facilitate his Frontline colleague to take on the service order.

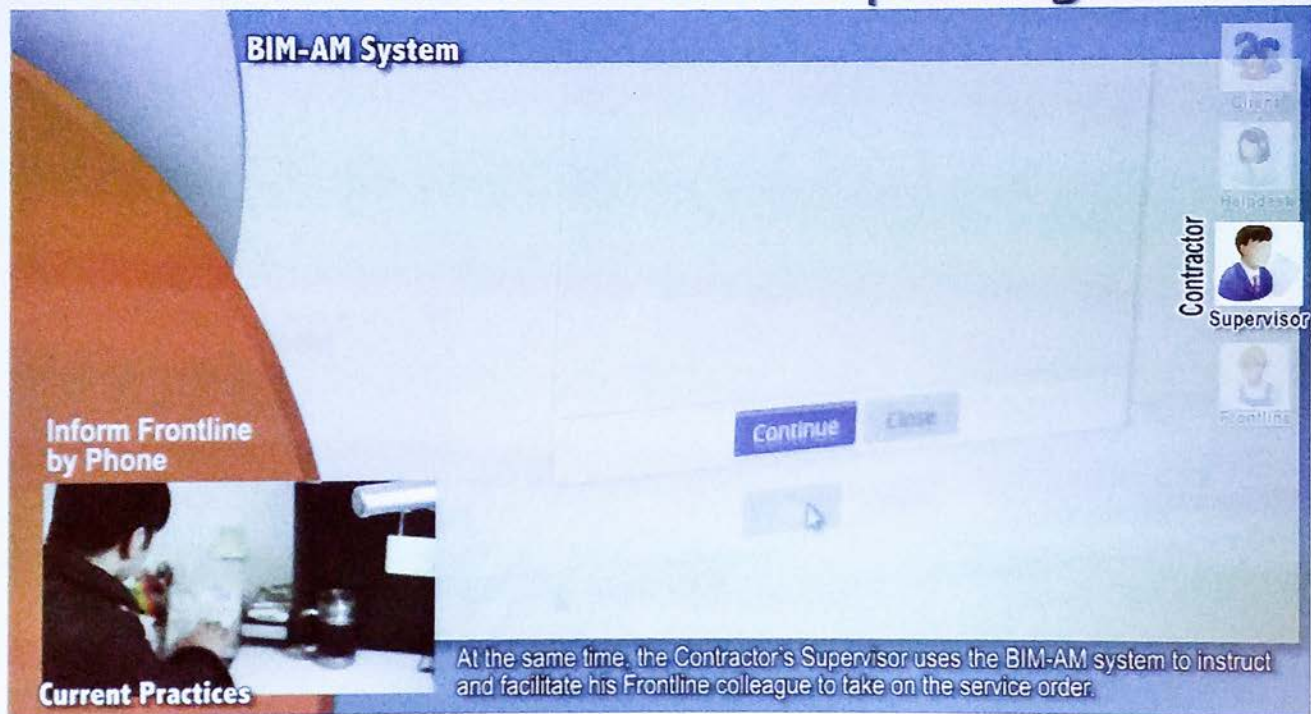
HVAC Showcase – Fault Reporting

BIM-AM System

Inform Frontline by Phone

Current Practices

At the same time, the Contractor's Supervisor uses the BIM-AM system to instruct and facilitate his Frontline colleague to take on the service order.



HVAC Showcase – Fault Reporting

BIM-AM System

Client

Helpdesk

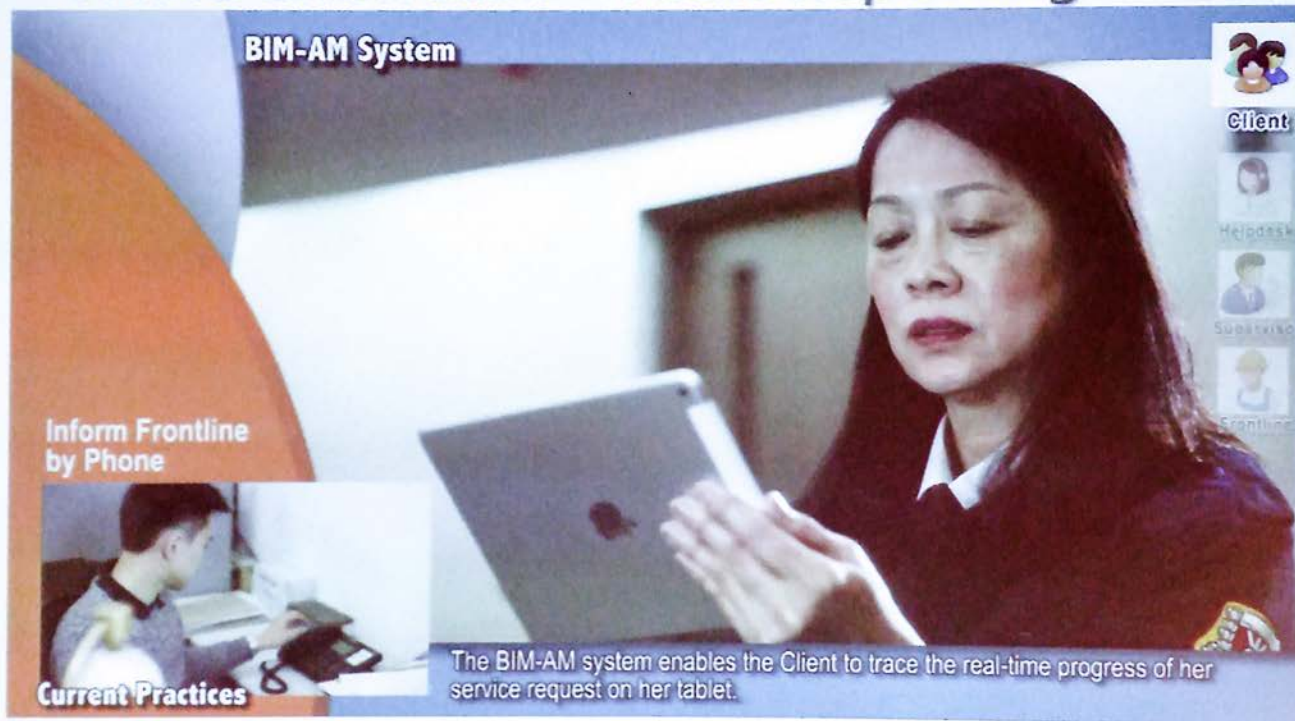
Subsiding

Frontline

Inform Frontline by Phone

Current Practices

The BIM-AM system enables the Client to trace the real-time progress of her service request on her tablet.

The image shows a woman with long dark hair, wearing a dark jacket over a white shirt, looking at a tablet. Overlaid on the image is a semi-transparent interface for the BIM-AM system. The interface includes a vertical list of icons on the right side, each with a label: 'Client' (a group of people icon), 'Helpdesk' (a person at a desk icon), 'Subsiding' (a person icon), and 'Frontline' (a person icon). On the left side, there is a smaller inset image showing a man at a desk with a phone, labeled 'Current Practices'. Above this inset, the text 'Inform Frontline by Phone' is displayed. At the bottom of the interface, a text box states: 'The BIM-AM system enables the Client to trace the real-time progress of her service request on her tablet.'

HVAC Showcase – Fault Reporting

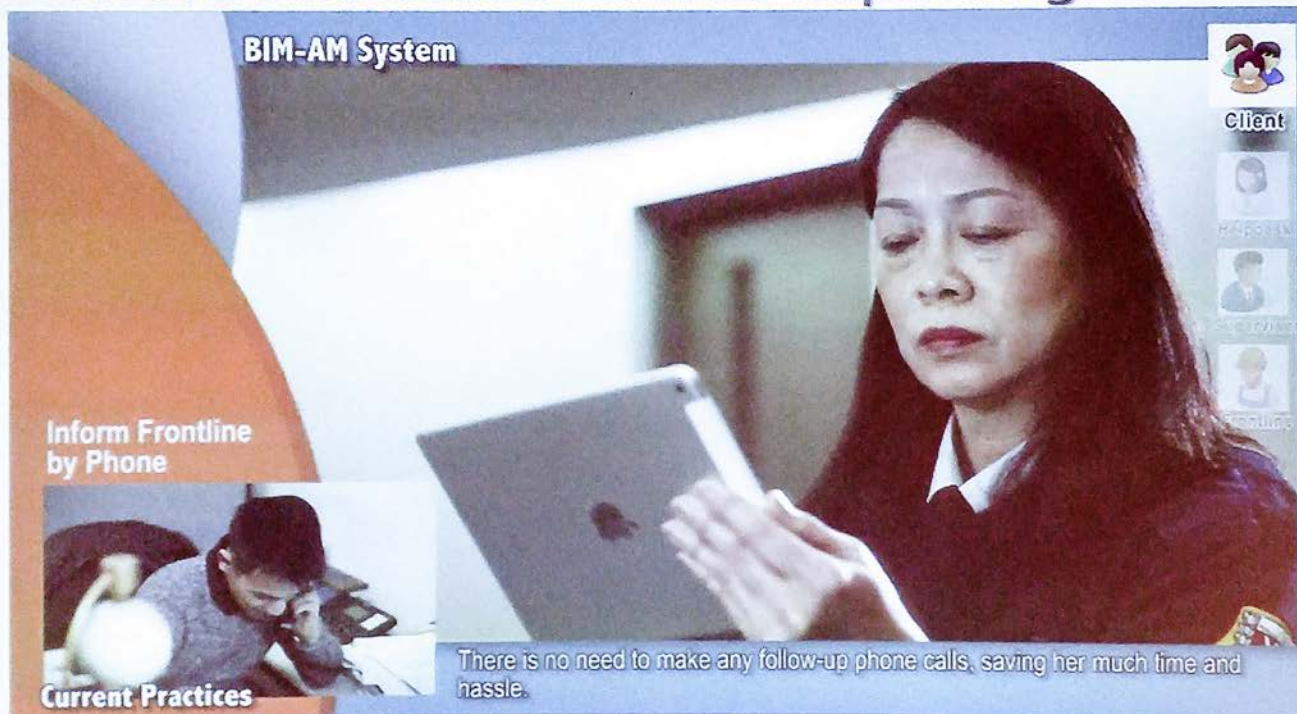
BIM-AM System

Client

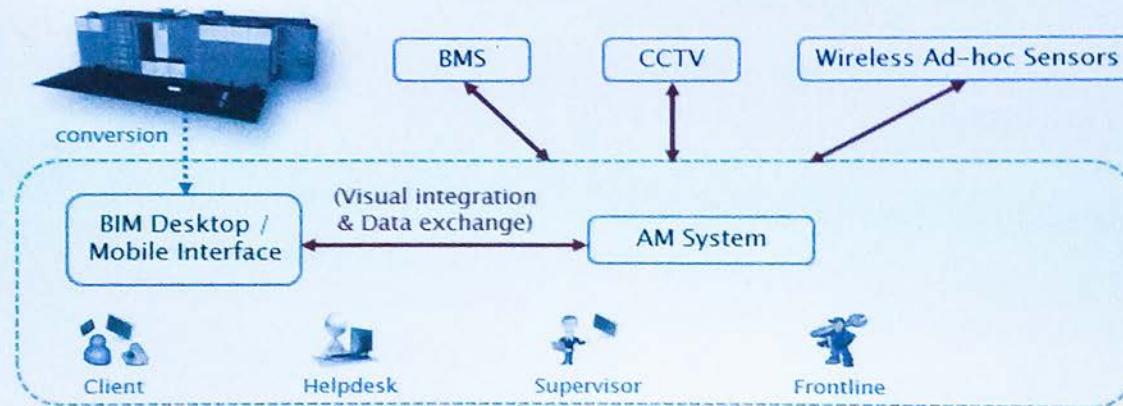
Inform Frontline by Phone

Current Practices

There is no need to make any follow-up phone calls, saving her much time and hassle.

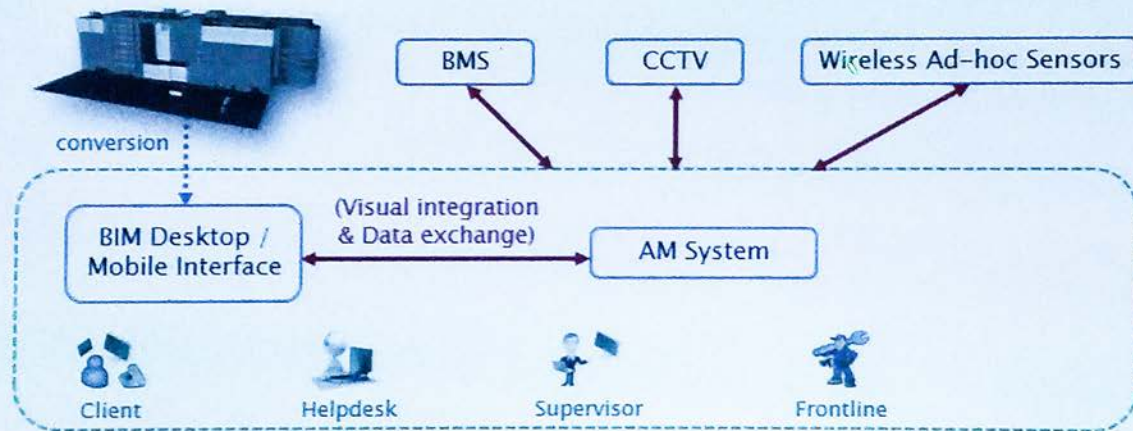
A woman with long dark hair, wearing a dark jacket over a white shirt, is looking down at a tablet computer she is holding. The image is framed as a video call window. On the right side of the window, there is a vertical list of participant icons, with the top one labeled 'Client'. In the bottom left corner of the video frame, there is a smaller inset image showing a person at a desk talking on a telephone. The text 'Inform Frontline by Phone' is overlaid on the main image, and 'Current Practices' is overlaid on the inset image. A caption at the bottom of the video frame states: 'There is no need to make any follow-up phone calls, saving her much time and hassle.'

Architecture for EMSD BIM-AM System



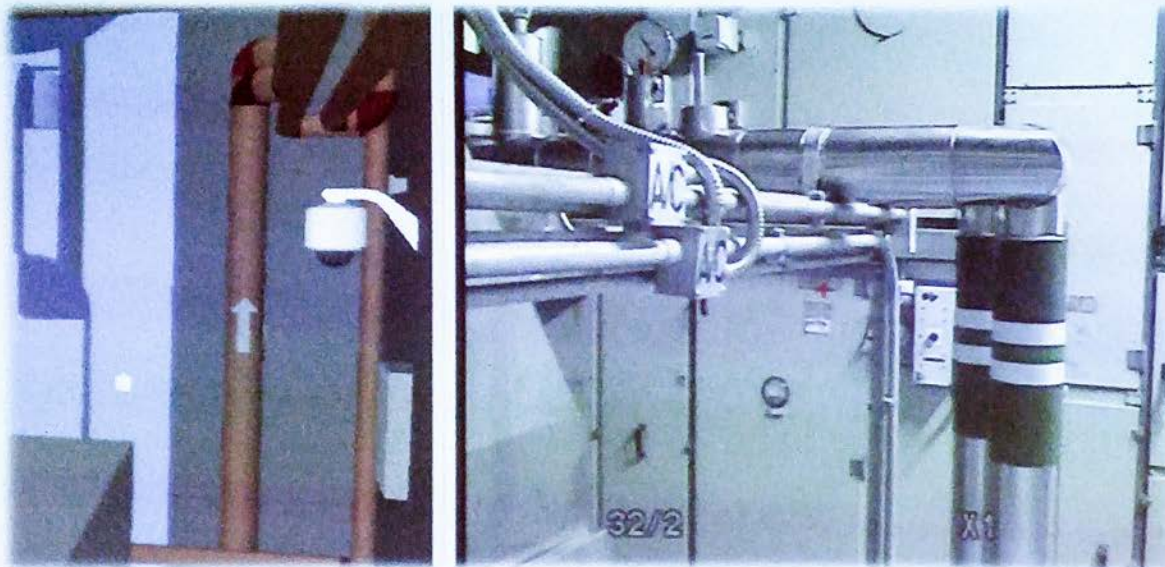
— Enhanced integration implemented by EMSD

Architecture for EMSD BIM-AM System



— Enhanced integration implemented by EMSD

Interfacing with CCTV System for pre-diagnosis

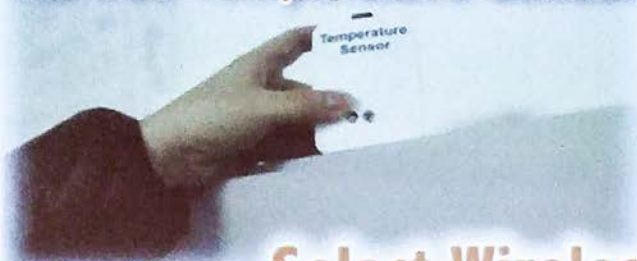


Integrating with Building Management System (BMS) for pre-diagnosis

1029820	03/03/2016 17:31	53.016	DAHU706.MA.H	MA Humidity
1029821	03/03/2016 17:31	0	DAHU706.EW.S	Energy Wheel Status
1029822	03/03/2016 17:31	0	DAHU706.EW.O	Energy Wheel Trip
1029823	03/03/2016 17:31	1.61	DAHU706.FA.DS	FA Damper Status
1029824	03/03/2016 17:31	0	DAHU706.FA.F	FA Flowrate
1029825	03/03/2016 17:31	58.6	DAHU706.FA.ENTH	FA Enthapy
1029826	03/03/2016 17:31	21.68	DAHU706.FA.T	FA Tempertaure
1029827	03/03/2016 17:31	51.5	DAHU706.FA.H	FA Humidity
1029828	03/03/2016 17:31	0	DAHU706.FA.PD	FA Filter Alarm
1029829	03/03/2016 17:31	100	VAV7F_57FDS	VAV Damper Status
1029830	03/03/2016 17:31	0	VAV7F_57FLW	VAV Flowrate
1029831	03/03/2016 17:31	22.13	VAV7F_57RMT	VAV Rm Temp
1029832	03/03/2016 17:31	38.13	VAV7F_58FDS	VAV Damper Status
1029833	03/03/2016 17:31	44	VAV7F_58FLW	VAV Flowrate
1029834	03/03/2016 17:31	22.75	VAV7F_58RMT	VAV Rm Temp
1029835	03/03/2016 17:31	38.13	VAV7F_55FDS	VAV Damper Status
1029836	03/03/2016 17:31	0	VAV7F_55FLW	VAV Flowrate
1029837	03/03/2016 17:31	25.65	VAV7F_55RMT	VAV Rm Temp
1029838	03/03/2016 17:31	100	VAV7F_56FDS	VAV Damper Status
1029839	03/03/2016 17:31	16	VAV7F_56FLW	VAV Flowrate
1029840	03/03/2016 17:31	22.4	VAV7F_56RMT	VAV Rm Temp
1029748	03/03/2016 17:30	25.5	DAHU706.TSP2	Return Temp Set PT (EMSD)

Integrating with wireless ad-hoc devices for condition monitoring

Ad-hoc Temperature Sensor



Ad-hoc Mobile CCTV



**Select Wireless Devices
Appended to a Particular Asset**

**Ad-hoc Acoustic/Vibration
Sensor**



Ad-hoc Power Meter



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

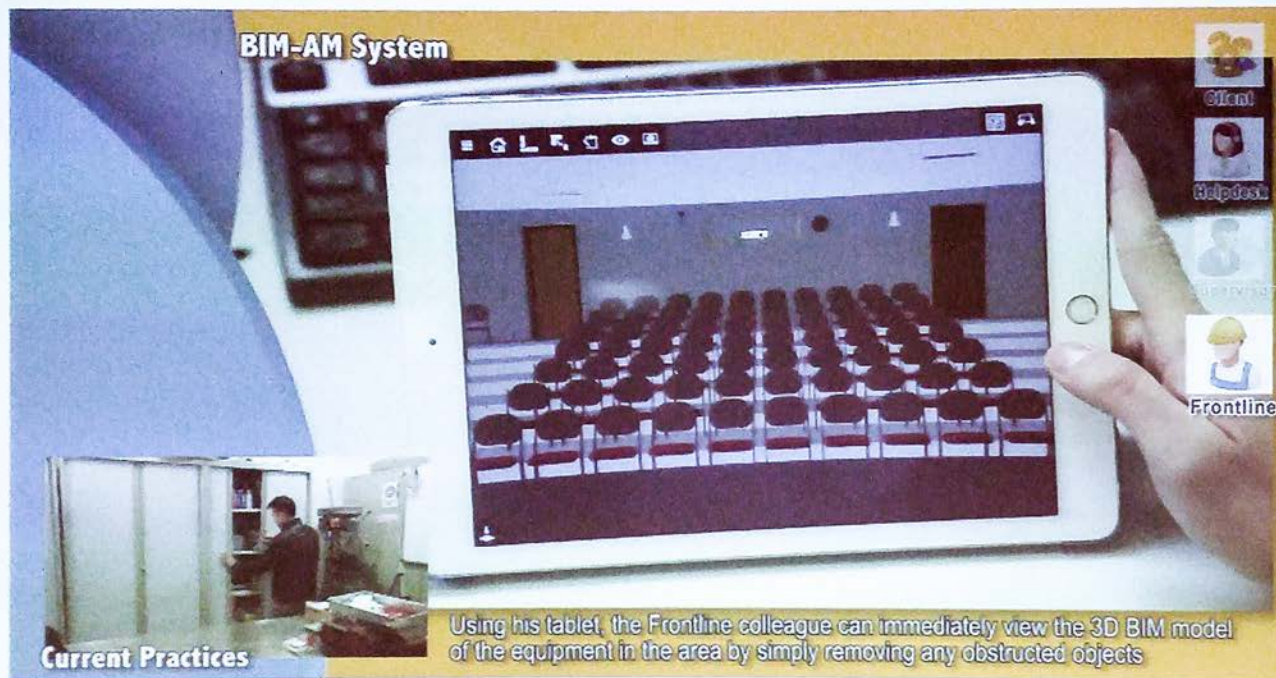


Current Practices



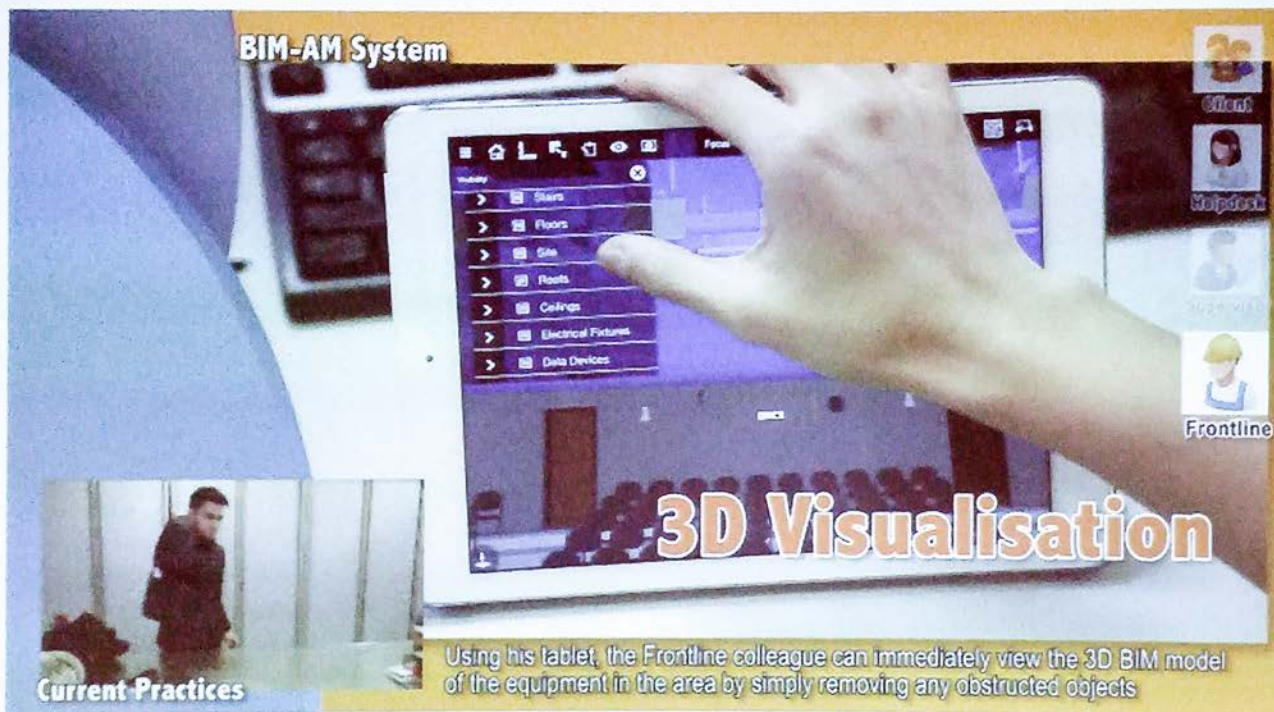
Using his tablet, the Frontline colleague can immediately view the 3D BIM model of the equipment in the area by simply removing any obstructed objects

HVAC Showcase – Off-site Pre-diagnosis



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System



3D Visualisation

Current Practices

Using his tablet, the Frontline colleague can immediately view the 3D BIM model of the equipment in the area by simply removing any obstructed objects

HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

3D Visualisation

such as ceilings and walls without having to waste time looking for 2D layout plans. Tracing the ducting and piping graphics on BIM-AM.

Current Practices

Contractor's 1st attendance on-site

Client
Helpdesk
Frontline

HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System



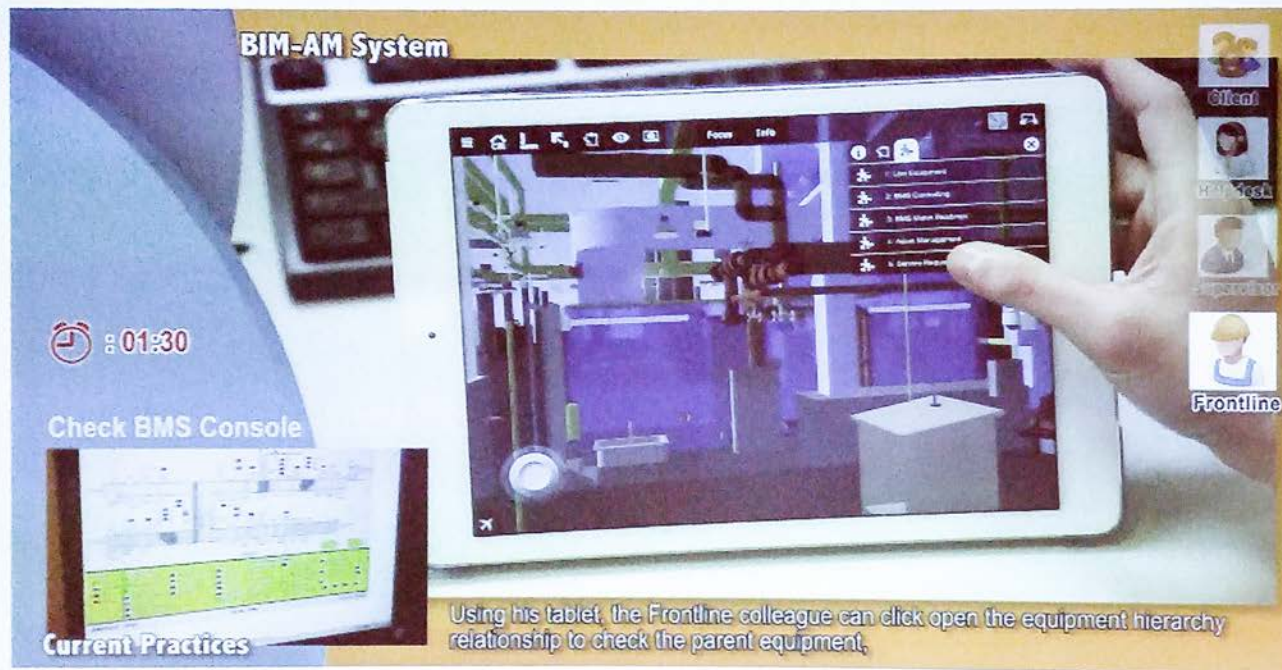
3D Manoeuvring

he easily finds an Air Handling Unit (AHU) next to the Lecture Theatre which he suspects is the fault location.

Current Practices

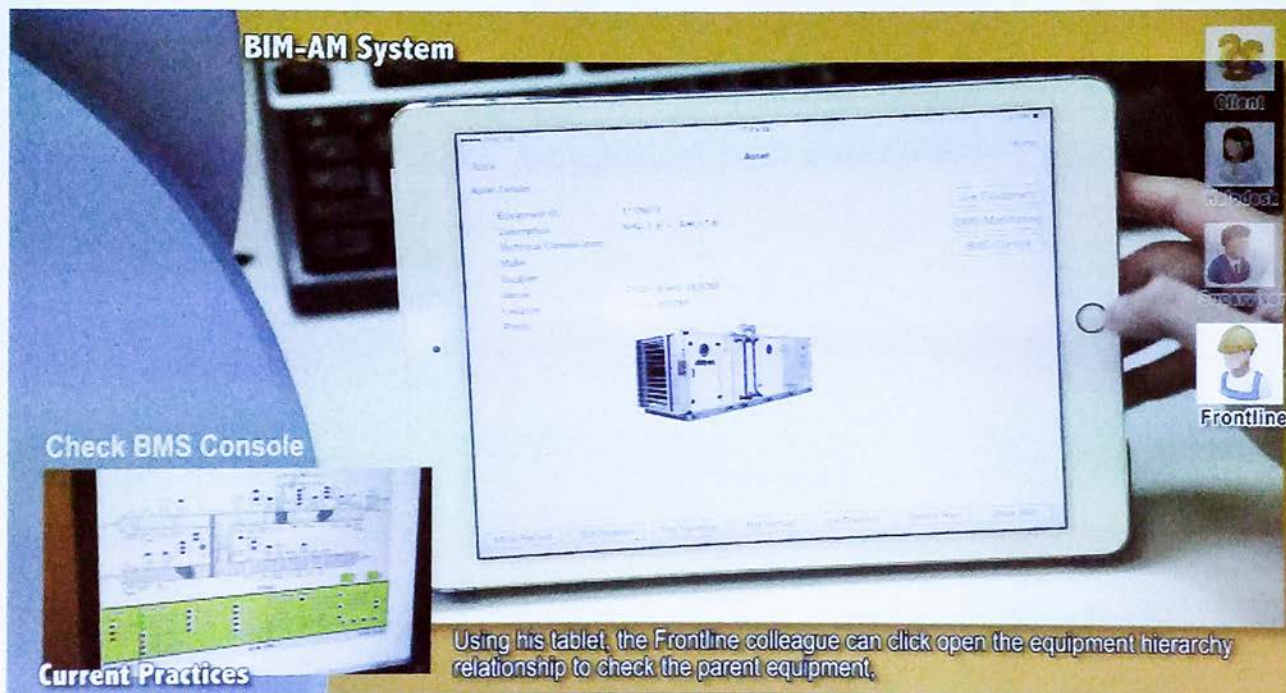


HVAC Showcase – Off-site Pre-diagnosis



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

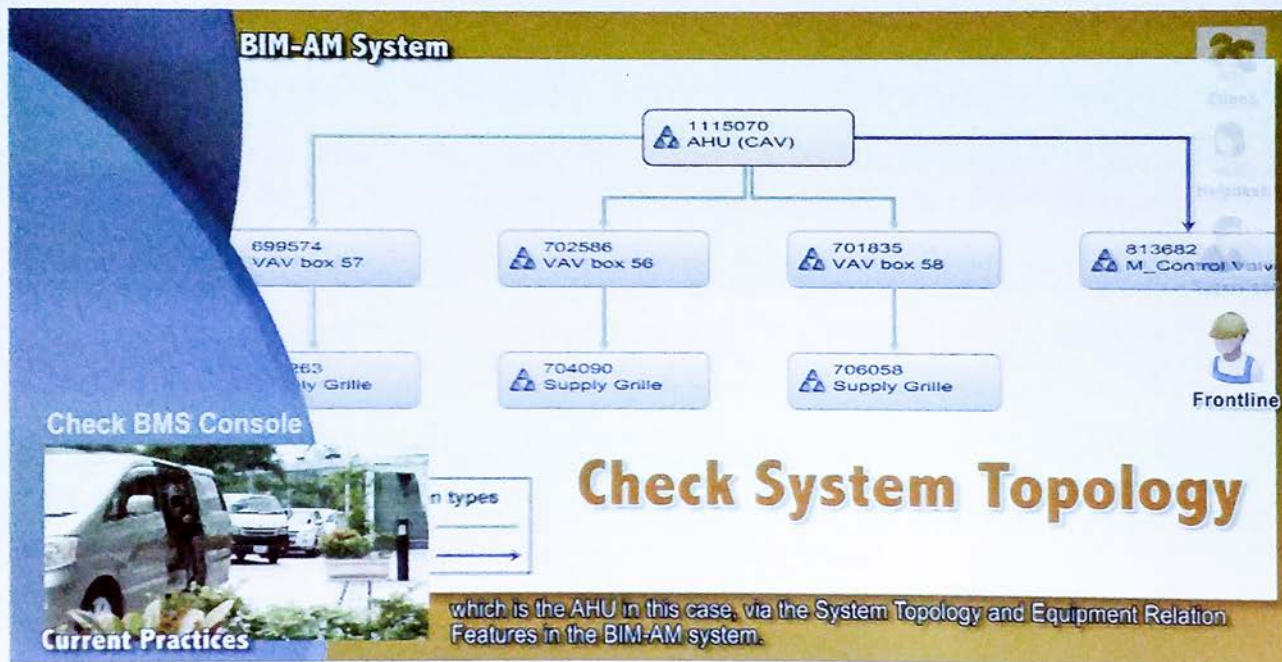


Check BMS Console

Current Practices

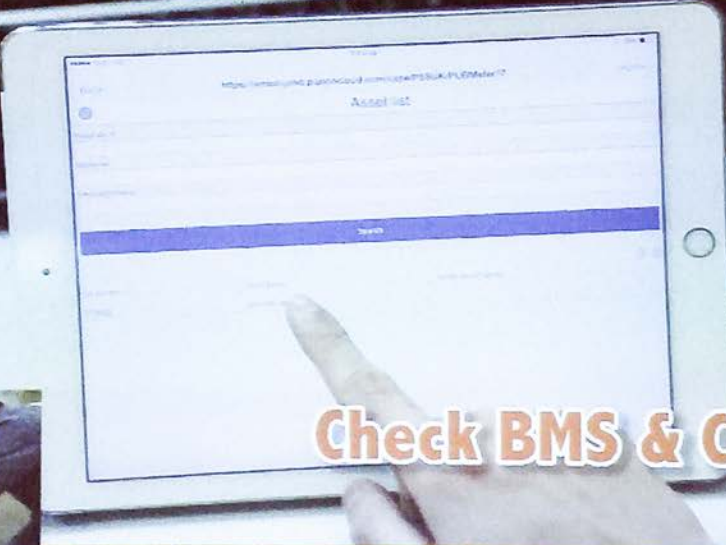
Using his tablet, the Frontline colleague can click open the equipment hierarchy relationship to check the parent equipment.

HVAC Showcase - Off-site Pre-diagnosis



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System



Check BMS & CCTV

As BIM-AM system is integrated with Building Management System and CCTV system, the Frontline staff can immediately

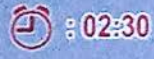
Current Practices



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System



 : 02:30

Return and Take Drawings



Current Practices

Check BMS & CCTV

access all necessary real-time information on his tablet for carrying out the maintenance work, such as the AHU system status and a live view of the site.



HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

Return and Take Drawings

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HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

Return and Take Drawings

Current Practices

Check Maintenance History

The Frontline colleague can also access the relevant maintenance records. He finds that the motor control valve has a history of replacement and occasional jams.

Equipment ID	Description	Service Order	Description	Status	Completed on
2912.00	Jammed by rubbish accumulation			Use Administrator	
2913.00	Parts replaced			Use Administrator	
2914.00	Jammed by rubbish accumulation			Use Administrator	
2915.00	Parts replaced			Use Administrator	
2916.00	replaced			Use Administrator	
2917.00	Parts replaced			Use Administrator	
2918.00	Parts replaced			Use Administrator	

Reference Number	Status	Completed on
	Use Administrator	
	Use Administrator	
	Use Administrator	
	Use Administrator	
	Use Administrator	
	Use Administrator	

HVAC Showcase – Off-site Pre-diagnosis

BIM-AM System

Return and Take Drawings

Current Practices

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2913.00	Parts replaced		Use Adminstr...	
2914.00	Jammed by rubbish accumulation		Use Adminstr...	
2915.00	replaced		Use Adminstr...	
2916.00	Jammed by rubbish acc...		Use Adminstr...	
2917.00	Parts replaced		Use Adminstr...	

HVAC Showcase - Off-site Pre-diagnosis

BIM-AM System

Return and Take Drawings

Current Practices

Based on the BMS information and his experience, his diagnosis is that the motor control valve is the cause of the fault.

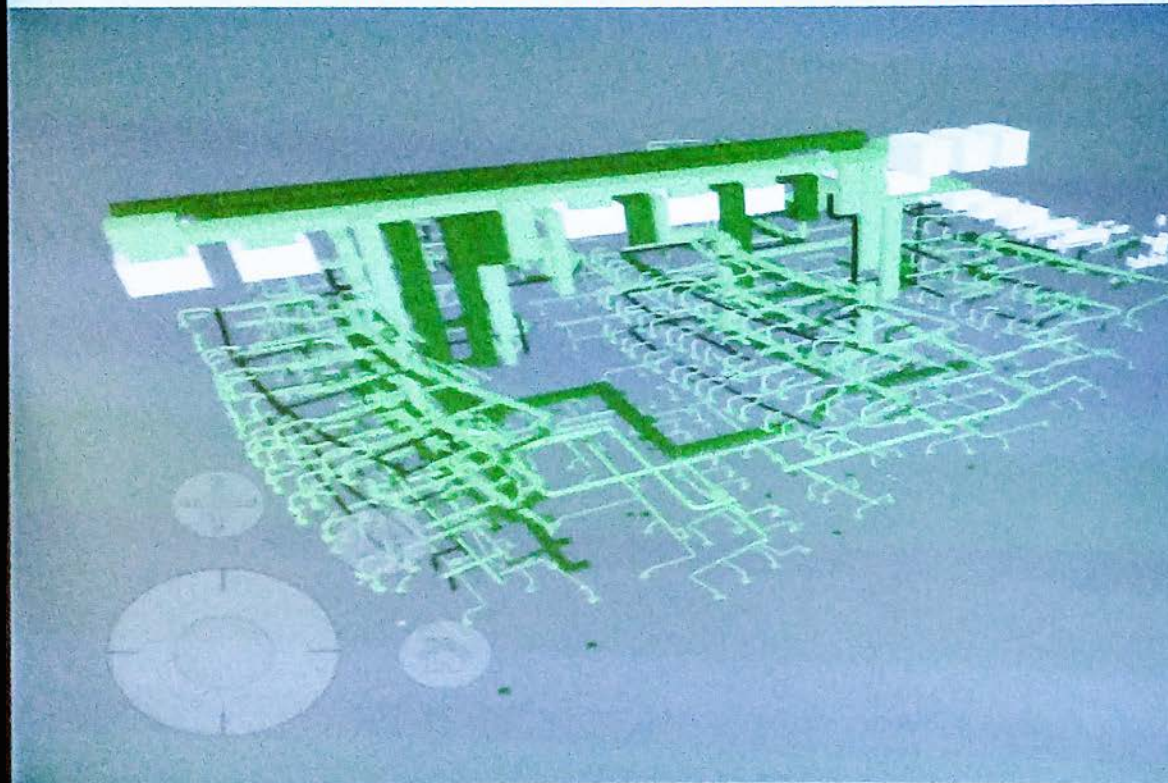
HVAC Showcase – Off-site Pre-diagnosis

- ▶ Ease of identifying fault location & faulty equipment
 - By BIM visualization and system topology

HVAC Showcase – Off-site Pre-diagnosis

- ▶ Ease of identifying fault location & faulty equipment
 - By BIM visualization and system topology

As-built BIM & MEP BIM Models handovered from Design & Construction stage



Models



Oakwood_Architectural



Oakwood_Electrical



Oakwood_Fire_Protection



Oakwood_HVAC



Oakwood_Plumbing



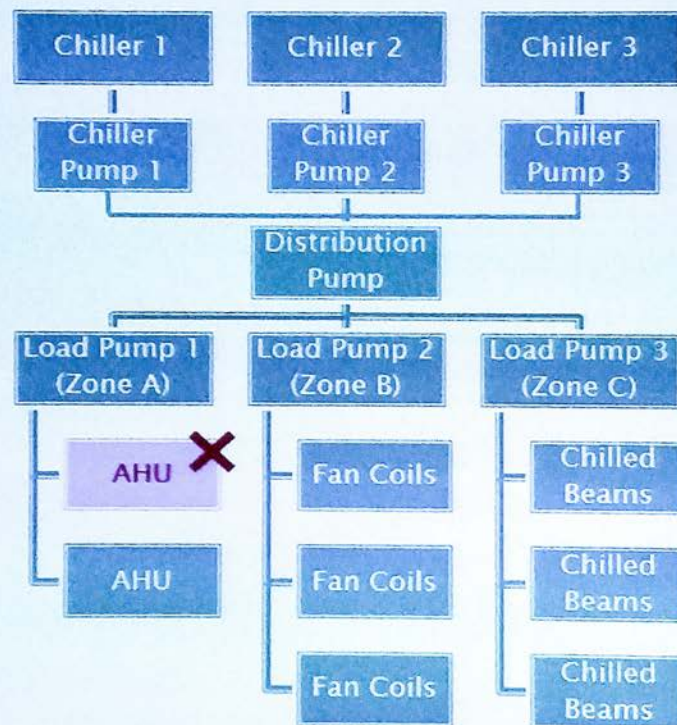
Oakwood_Structural



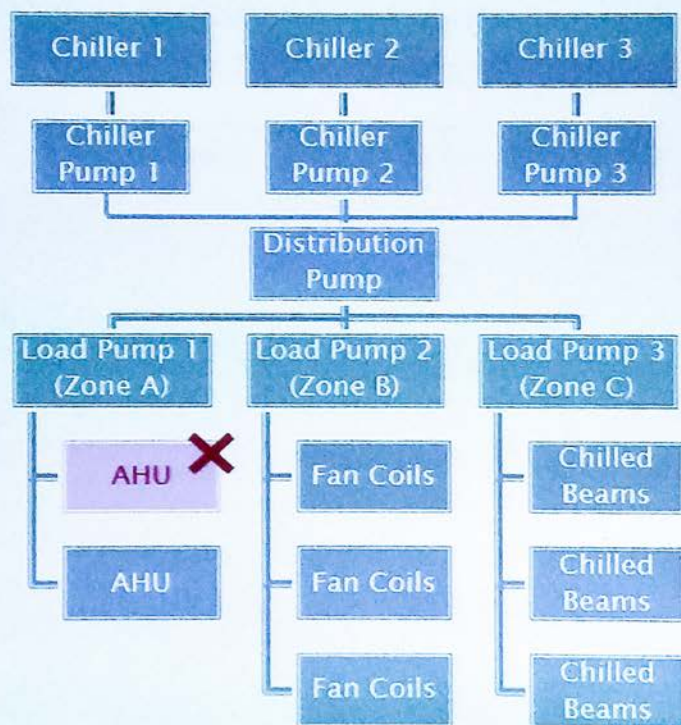
Ground



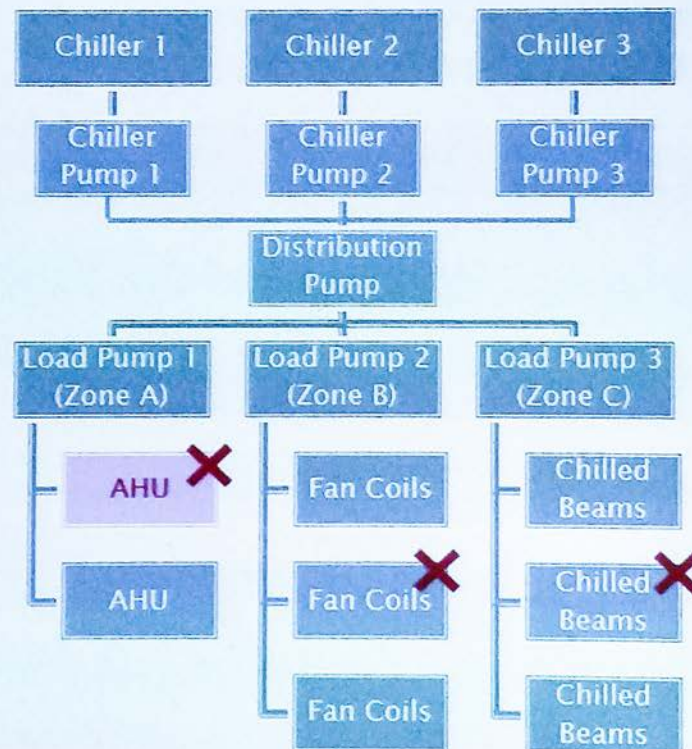
System Topology visualizing the asset relationships within a particular system



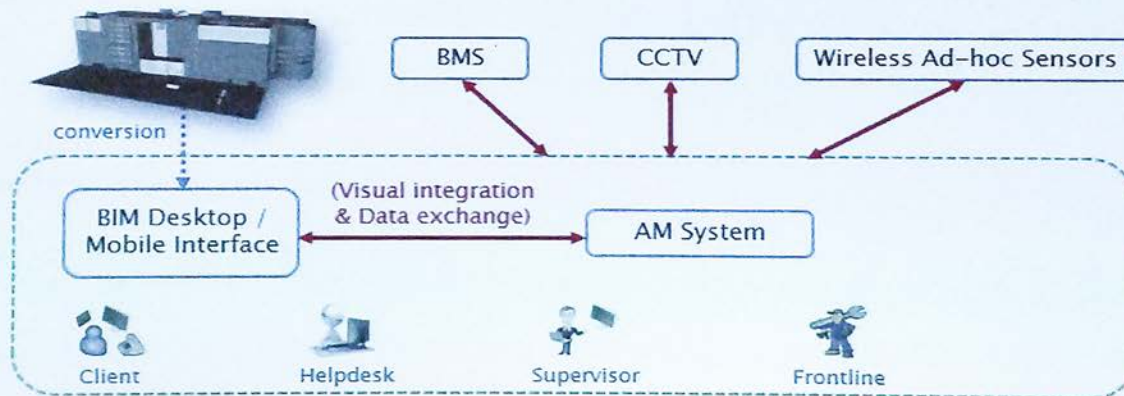
System Topology visualizing the asset relationships within a particular system



System Topology visualizing the asset relationships within a particular system



Architecture for EMSD BIM-AM System



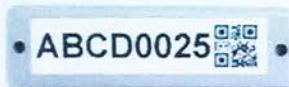
— Enhanced integration implemented by EMSD

Integrating with RFID scanning tool for locating fixed assets

Back RFID Scanning +Scanner

1128-HK-001008 2.3.0 3.6.0 Battery 87%
 29 Scan Search By ID

Equipment ID	Description	Location	System Type	Signal
1204721	Exit Sign 1	Zone 3A, 3A (Lect...	LVSB	65 %
699574	VAV box 57	Zone 3A, 3A (Lect...	HVAC	62 %
000258	AHU supply 1.4 - 2.8 m3/s	Zone 1, LOBBY	HVAC	57 %
1181403	TV Monitor at 7th Floor	Zone 2, Common...	GE	54 %
000244	Airco Unit	Ahu Room, Ahu R...	HVAC	53 %
000243	Emergency lighting decentrally fed	Zone 2, Common...	LIGHT	51 %
959953	Spnnkler Head (3)	Zone 2, Common...	FSI	48 %



Integrating with RFID scanning tool for locating fixed assets

Back RFID Scanning +Scanner

1128-HK-001008 2.3.0 3.6.0 Battery 87%

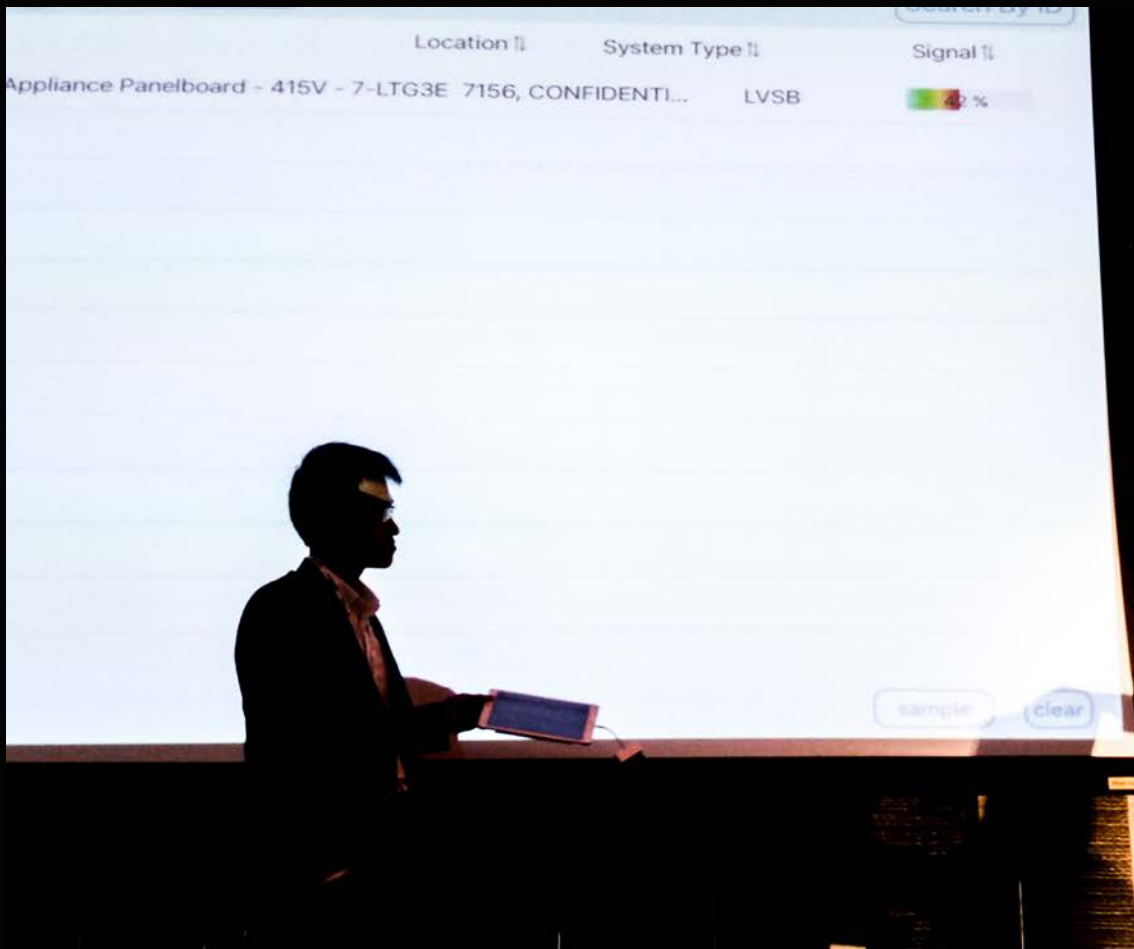
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1181403	TV Monitor at 7th Floor	Zone 2, Common...	GE	54 %
000244	Airco Unit	Ahu Room, Ahu R...	HVAC	53 %
000243	Emergency lighting decentrally fed	Zone 2, Common...	LIGHT	51 %
959953	Sprinkler Head (3)	Zone 2, Common...	FSI	48 %









1010 4G

Back

RFID Scanning

+Scanner

1128-HK-001008

2.3.0

3.6.0

29

Scan

Battery 99%

Search By ID

Equipment ID ↑↓

Description ↑↓

Location ↑↓

System Type ↑↓

Signal ↑↓

1273845

M_Lighting and Appliance Panelboard - 415V - 7-LTG3E 7156, CONFIDENTI...

LVSB

42 %

sample

clear

[Back](#)

Asset Details

Equipment ID	1273845
Description	M_Lighting and Appliance Panelboard - 4...
Technical Classification	
Make	Federal
Supplier	EXC000004Wenden Engineering Service...
Venue	EMSD HQS (NEW)
Location	CONFIDENTIAL REGISTRY
Photo	



[Additional Attribute\(s\)](#)

[Mtce Record](#)

[Eqt Relation](#)

[Sys Topology](#)

[Sys Drawing](#)

[Service Req](#)

[Show BIM](#)

[Back](#)

Asset Details

Equipment ID	1273845
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Additional Attribute(s)

[Mtce Record](#)

[Eqt Relation](#)

[Sys Topology](#)

[Drawing](#)

[Service Req](#)

[Show BIN](#)



HVAC Showcase – On-site Repair

BIM-AM System

Get Spare Parts & Tools in ONE go

Current Practices

The pre-diagnosis enables him to take all necessary spare parts and tools for on-site repair, thus avoiding repeat trips

Frontline



HVAC Showcase – On-site Repair

BIM-AM System ⌚ : 01:00

Try to Identify Fault Location

Current Practices

Upon arriving at the Lecture Theatre, he takes the room temperature and finds it is still above normal.

Client
Helpdesk
Supervisor
Frontline

HVAC Showcase – On-site Repair

BIM-AM System

Try to Identify Fault Location

Gesture Synchronisation

The Gesture Synchronisation mode in the BIM-AM system enables him to quickly verify the location of the AHU.

Current Practices

Client
Helpdesk
Supervisor
Frontline

HVAC Showcase – On-site Repair

BIM-AM System ⌚ : 01:10

⌚ : 04:00
Try to Identify Fault Location

Current Practices

The Gesture Synchronisation mode in the BIM-AM system enables him to quickly verify the location of the AHU.

Frontline

HVAC Showcase – On-site Repair

BIM-AM System

Try to Identify Fault Equipment

Verify the Equipment by RFID tools

Current Practices

He proceeds to the AHU and uses a RFID scanner to verify the control valve and double check its maintenance record.

Frontline

HVAC Showcase – On-site Repair

BIM-AM System

Try to Identify Fault Equipment

Verify the Equipment by RFID tools

He proceeds to the AHU and uses a RFID scanner to verify the control valve and double check its maintenance record.

Current Practices

Frontline

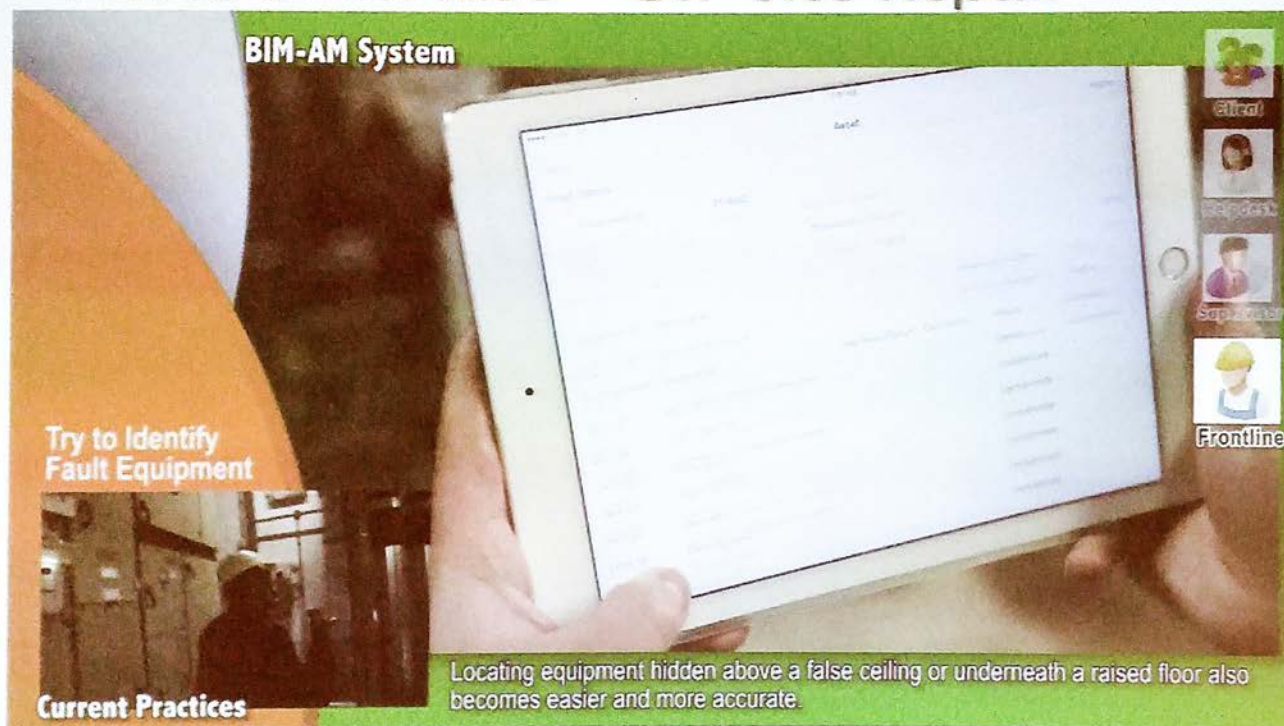
HVAC Showcase – On-site Repair

BIM-AM System

Try to Identify Fault Equipment

Current Practices

Locating equipment hidden above a false ceiling or underneath a raised floor also becomes easier and more accurate.



HVAC Showcase - On-site Repair

BIM-AM System

Try to Identify Fault Equipment

Current Practices

Equipment ID	Description	Date	Status	Completion
1001-001	Filter replaced	2023-10-26	Completed	2023-10-26
1001-002	Coil cleaned	2023-10-27	In Progress	
1001-003	Refrigerant check	2023-10-28	Pending	
1001-004	Motor oil change	2023-10-29	Not Started	
1001-005	System calibration	2023-10-30	Not Started	
1001-006	Parts replaced	2023-10-31	Not Started	

Work Order	Description	Date	Status	Completion
WO-001	Replace filter	2023-10-26	Completed	2023-10-26
WO-002	Clean coils	2023-10-27	In Progress	
WO-003	Check refrigerant	2023-10-28	Pending	
WO-004	Change motor oil	2023-10-29	Not Started	
WO-005	Calibrate system	2023-10-30	Not Started	
WO-006	Replace parts	2023-10-31	Not Started	

Locating equipment hidden above a false ceiling or underneath a raised floor also becomes easier and more accurate.

HVAC Showcase – On-site Repair

BIM-AM System

Current Practices

The Frontline staff can also access other information from the BIM-AM system such as static and animated Operation and Maintenance manuals.

BIM-AM System

Return & Pick up Tools & Spare Parts

Current Practices

Access O&M Manuals

The Frontline staff can also access other information from the BIM-AM system such as static and animated Operation and Maintenance manuals.

HVAC Showcase – On-site Repair

BIM-AM System

Service Instructions

05:00

Return & Pick up Tools & Spare Parts

Animated Manual

The Frontline staff can also access other information from the BIM-AM system such as static and animated Operation and Maintenance manuals.

Current Practices



HVAC Showcase – On-site Repair

The screenshot displays a video feed of a technician working on HVAC equipment. The interface includes several overlays: a top green bar with 'BIM-AM System' and a clock icon showing ': 03:40'; a left orange bar with a clock icon showing ': 07:30' and the text 'Back to Site to Repair'; a bottom-left inset video labeled 'Current Practices' showing a worker in a hard hat; and a right-side vertical list of icons with the 'Frontline' label at the bottom. A green text box at the bottom right contains the text: 'When the repair work is done, the Frontline colleague can immediately record and file his work in the BIM-AM system for record.'

HVAC Showcase – On-site Repair

The screenshot displays a video of HVAC repair work. Overlaid on the video are several interface elements:

- BIM-AM System**: Located at the top left of the video frame, accompanied by a clock icon and the time **:03:40**.
- Back to Site to Repair**: Located on the left side of the video frame, accompanied by a clock icon and the time **:07:30**.
- Current Practices**: Located at the bottom left of the video frame, with a small inset image showing a person working.
- User Avatars**: A vertical column of four avatars on the right side of the video frame, with the bottom one labeled **Frontline**.
- Text Description**: At the bottom right of the video frame, it reads: "When the repair work is done, the Frontline colleague can immediately record and file his work in the BIM-AM system for record."

HVAC Showcase – On-site Repair

The screenshot displays the BIM-AM System interface. At the top, it says 'BIM-AM System' with a clock icon and ':03:40'. Below this, there's a section titled 'Back to Site to Repair' with a clock icon and ':07:30'. To the right, there's a 'Record & File Maintenance Work' section. The interface also shows a 'Frontline' user profile with a hard hat icon. The background of the interface is a green and orange gradient.

BIM-AM System :03:40

Back to Site to Repair :07:30

Record & File Maintenance Work

When the repair work is done, the Frontline colleague can immediately record and file his work in the BIM-AM system for record.

HVAC Showcase – On-site Repair

BIM-AM System 🕒 : 03:40

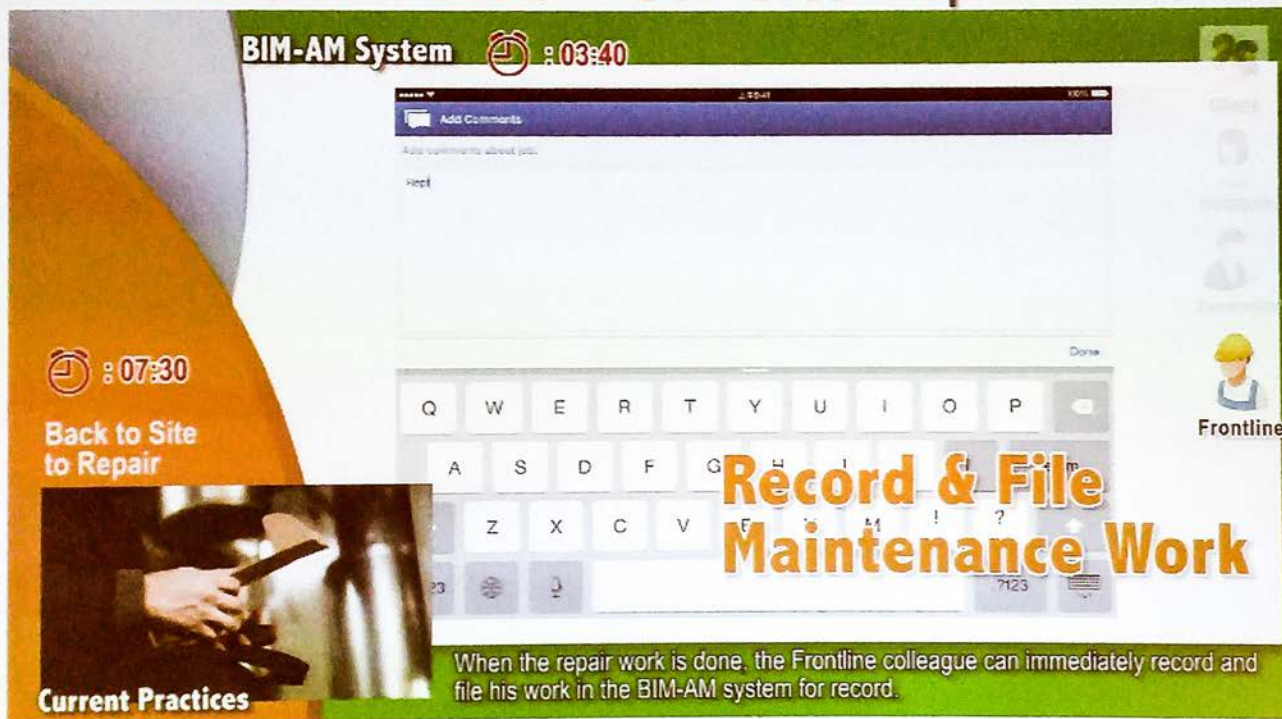
🕒 : 07:30
Back to Site to Repair

Current Practices

Record & File Maintenance Work

When the repair work is done, the Frontline colleague can immediately record and file his work in the BIM-AM system for record.

Frontline



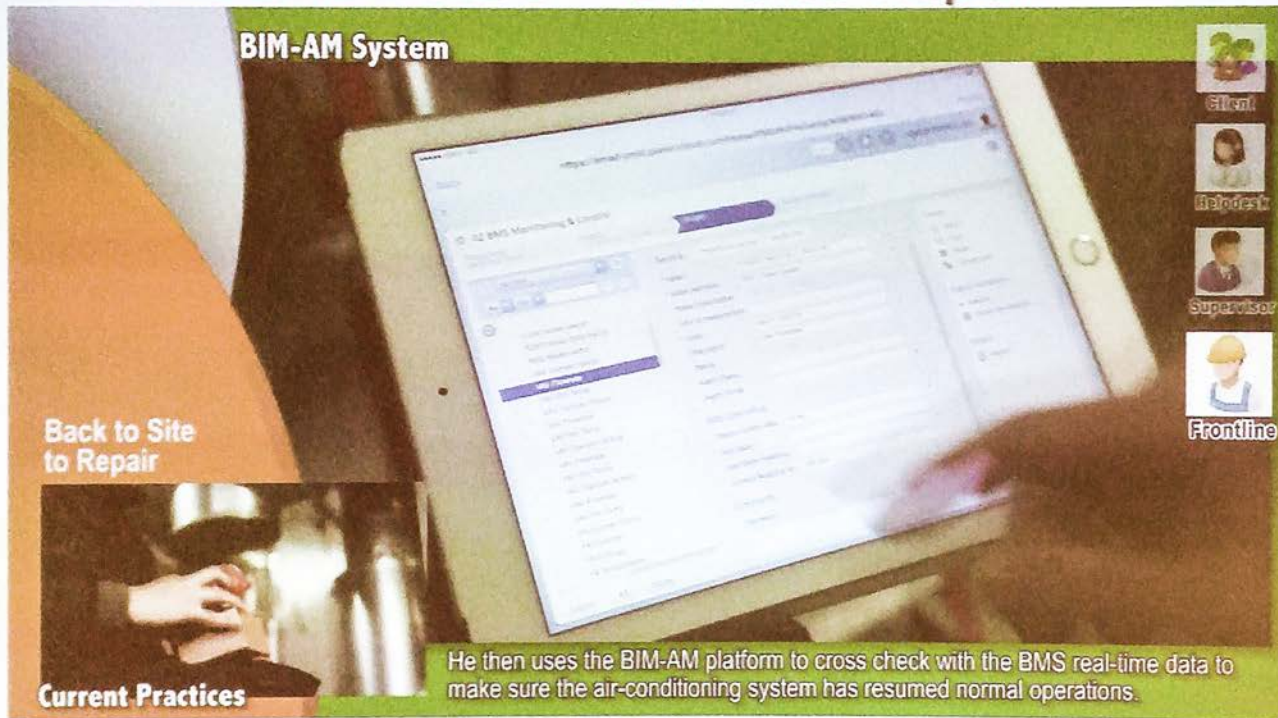
HVAC Showcase – On-site Repair

BIM-AM System

Back to Site to Repair

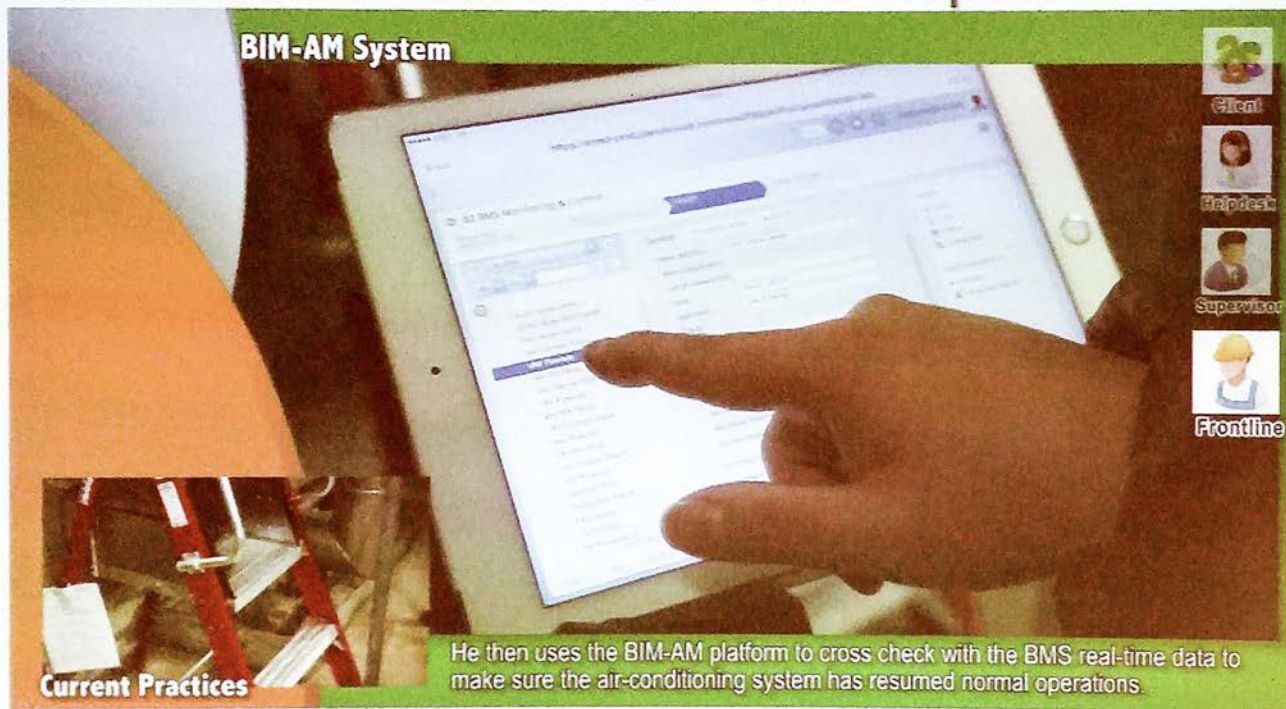
Current Practices

He then uses the BIM-AM platform to cross check with the BMS real-time data to make sure the air-conditioning system has resumed normal operations.



HVAC Showcase – On-site Repair

BIM-AM System



Current Practices

He then uses the BIM-AM platform to cross check with the BMS real-time data to make sure the air-conditioning system has resumed normal operations.

HVAC Showcase – On-site Repair

BIM-AM System

Alarm Since

BMS Controlling

Planon Control allo... N, No

Set value

Add Meter Reading...

Current Reading Va... 25.4

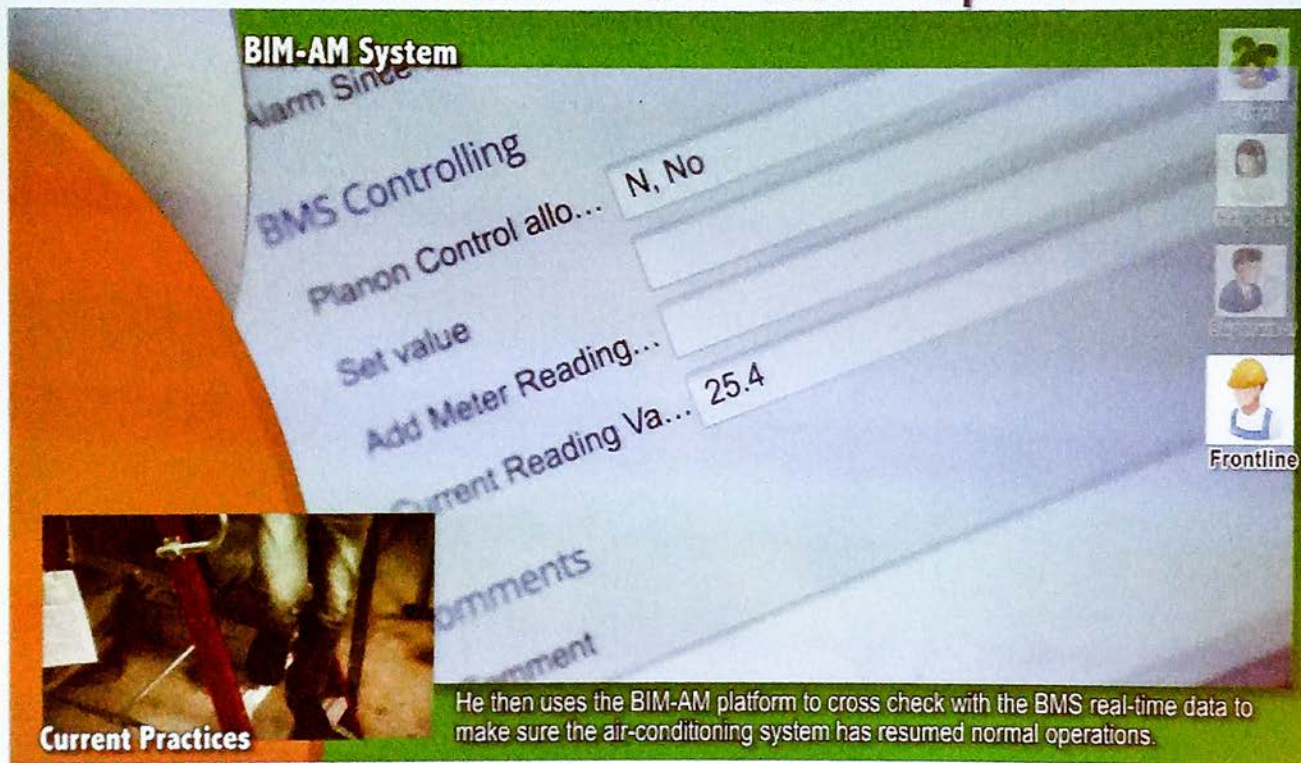
Comments

comment

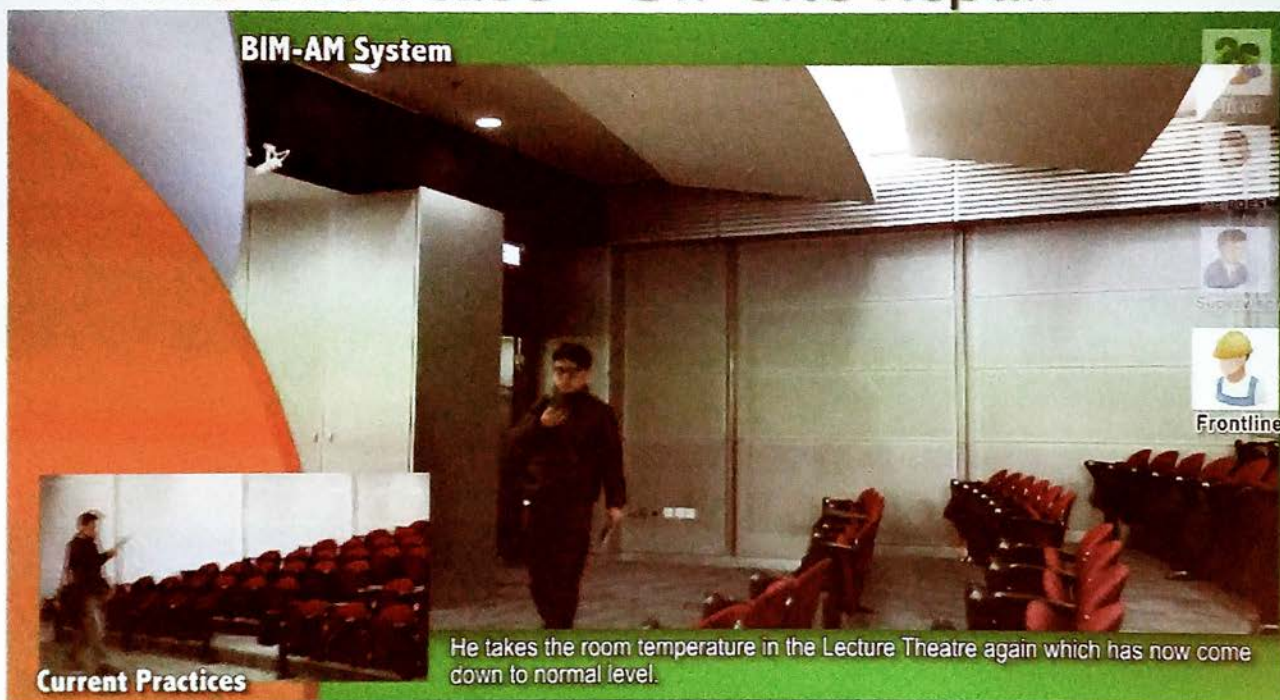
Frontline

Current Practices

He then uses the BIM-AM platform to cross check with the BMS real-time data to make sure the air-conditioning system has resumed normal operations.



HVAC Showcase – On-site Repair



HVAC Showcase – On-site Repair

BIM-AM System



Client
Helpdesk
Supervisor
Frontline

Current Practices

The Frontline staff then gets the Client officer to sign off on the BIM-AM system, bringing the repair job to a close.

HVAC Showcase - On-site Repair

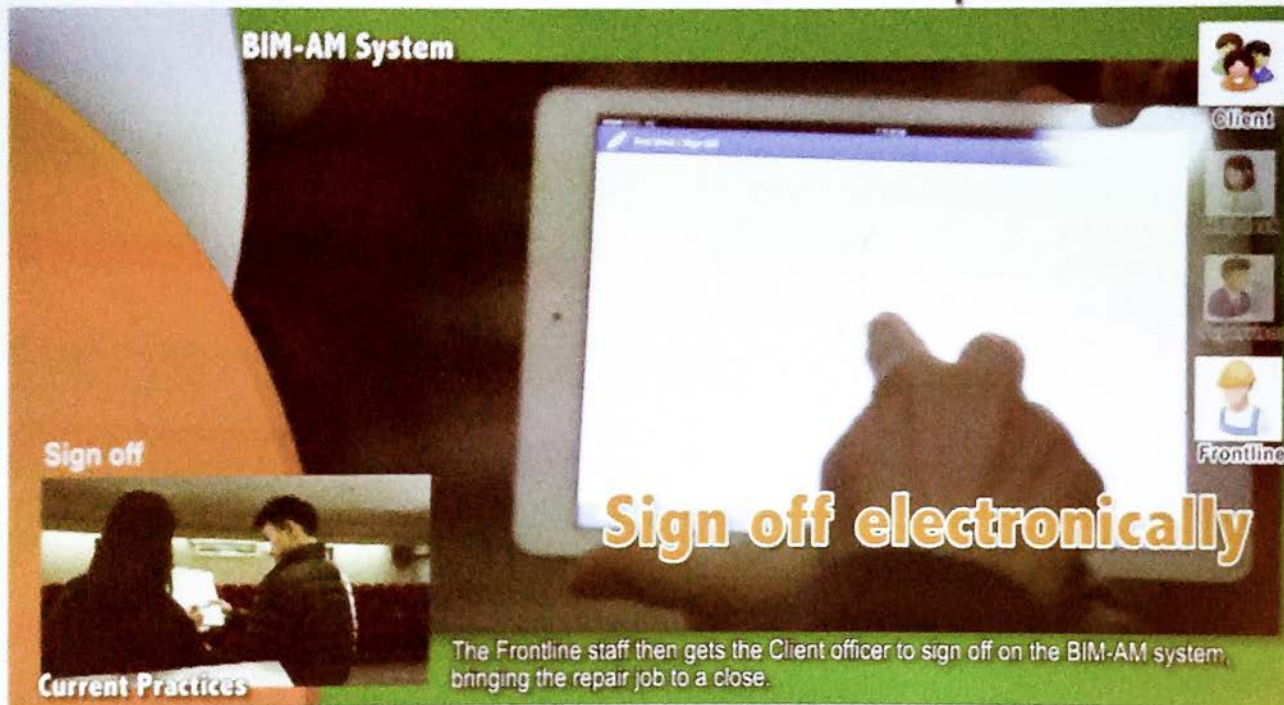
BIM-AM System

Sign off electronically

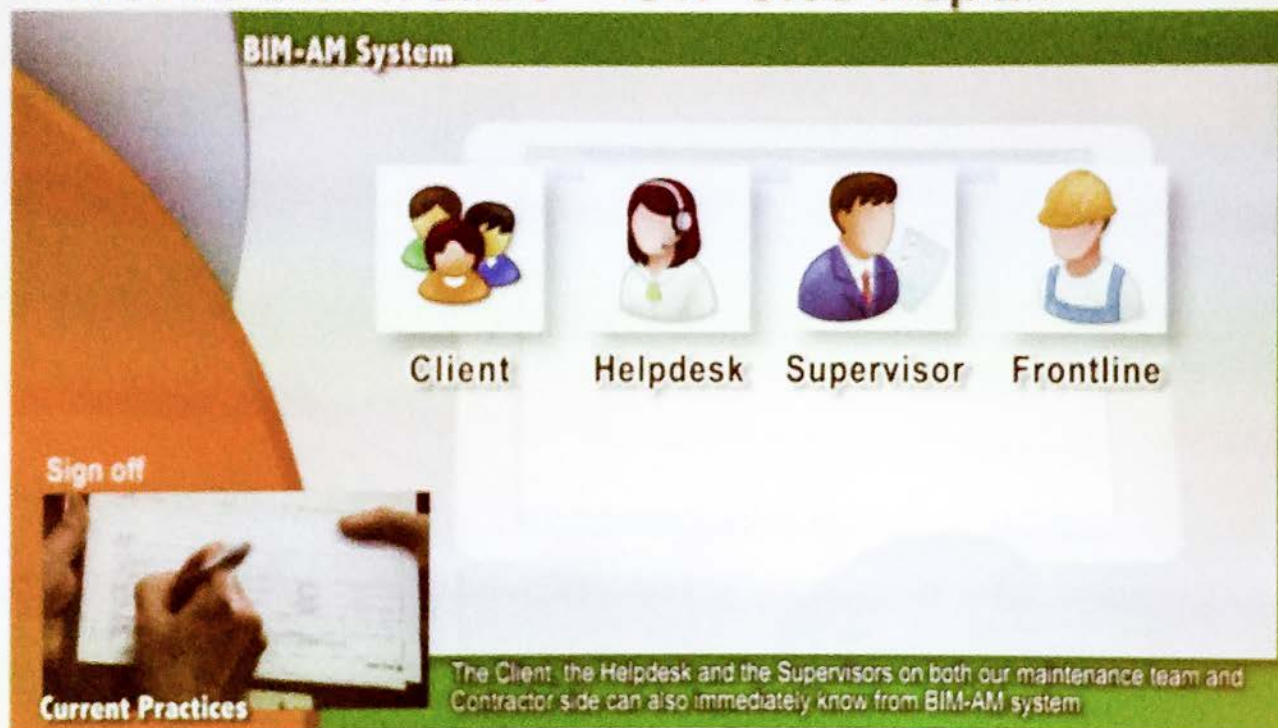
Sign off

Current Practices

The Frontline staff then gets the Client officer to sign off on the BIM-AM system, bringing the repair job to a close.



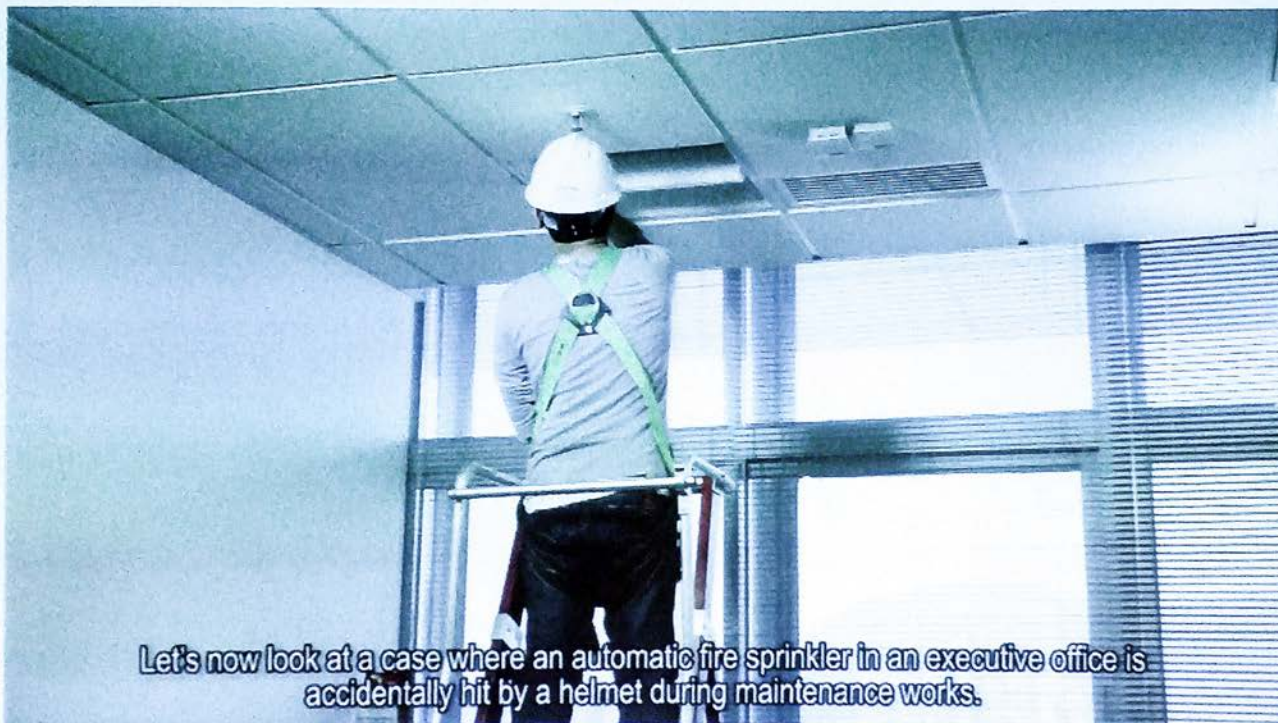
HVAC Showcase – On-site Repair



HVAC Showcase - On-site Repair

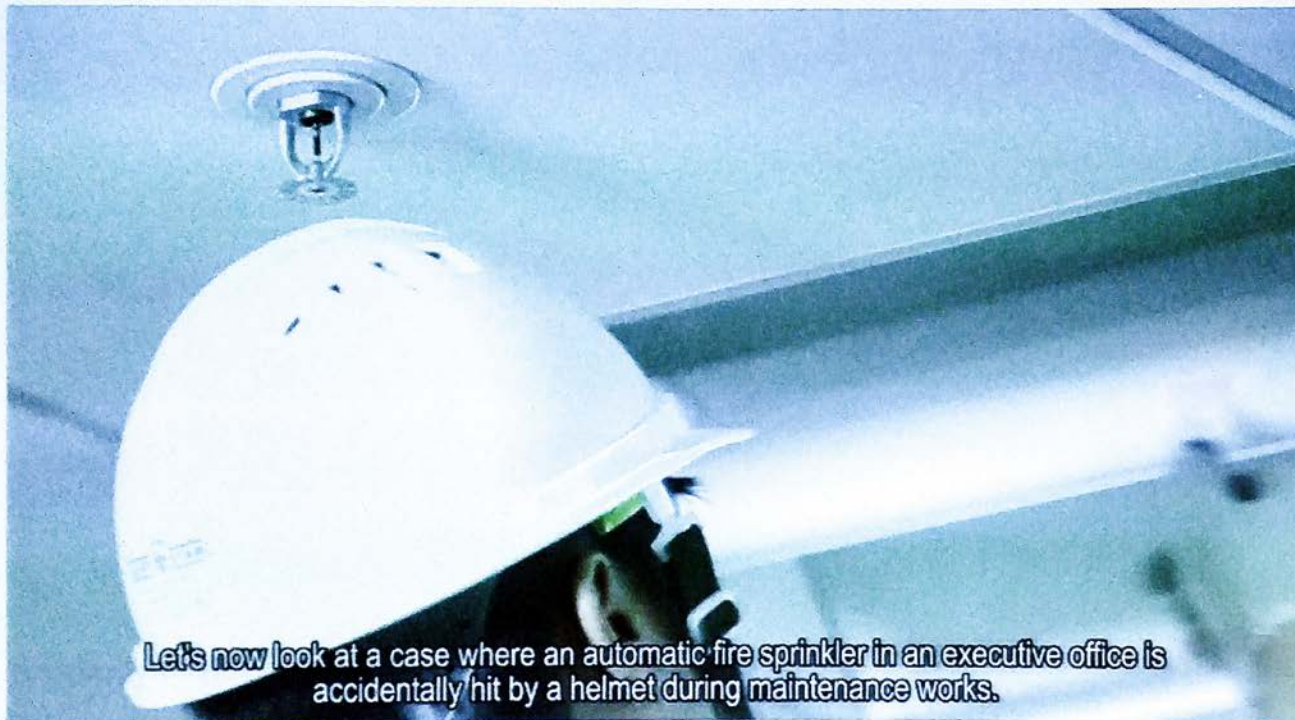


Incident Handling



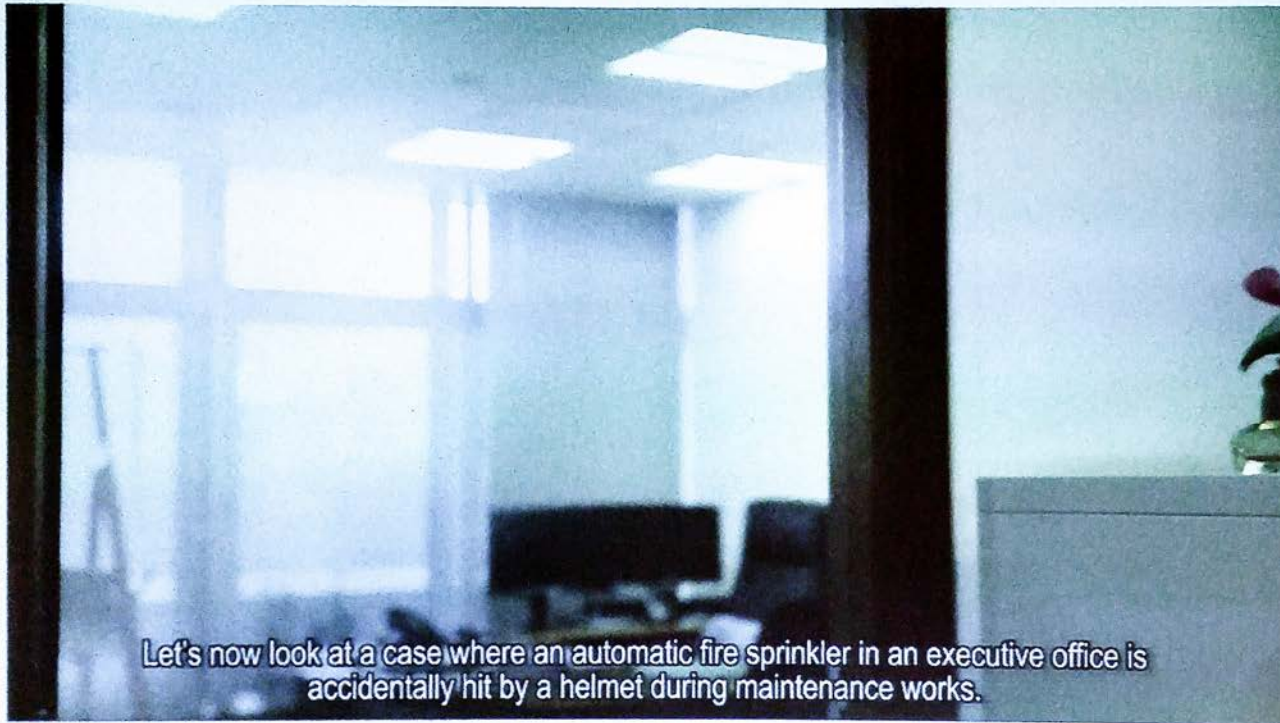
Let's now look at a case where an automatic fire sprinkler in an executive office is accidentally hit by a helmet during maintenance works.

Incident Handling



Let's now look at a case where an automatic fire sprinkler in an executive office is accidentally hit by a helmet during maintenance works.

Incident Handling



Incident Handling



Water is sprinkling in all directions in the room.

Incident Handling

BIM-AM System

Current Practices



The Helpdesk staff inputs the service request into the BIM-AM system.

Incident Handling

BIM-AM System

Current Practices



Incident Handling

BIM-AM System

Current Practices

00:01:30

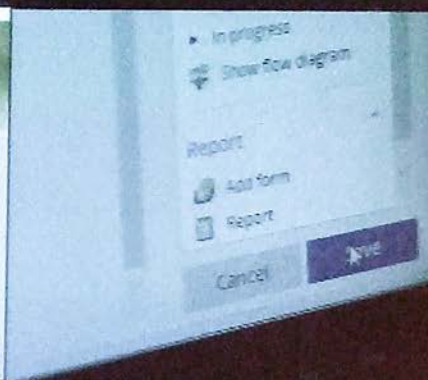
The BIM-AM system immediately alerts both the Client's supervisor and the Contractor's supervisor.

Incident Handling

Current Practices

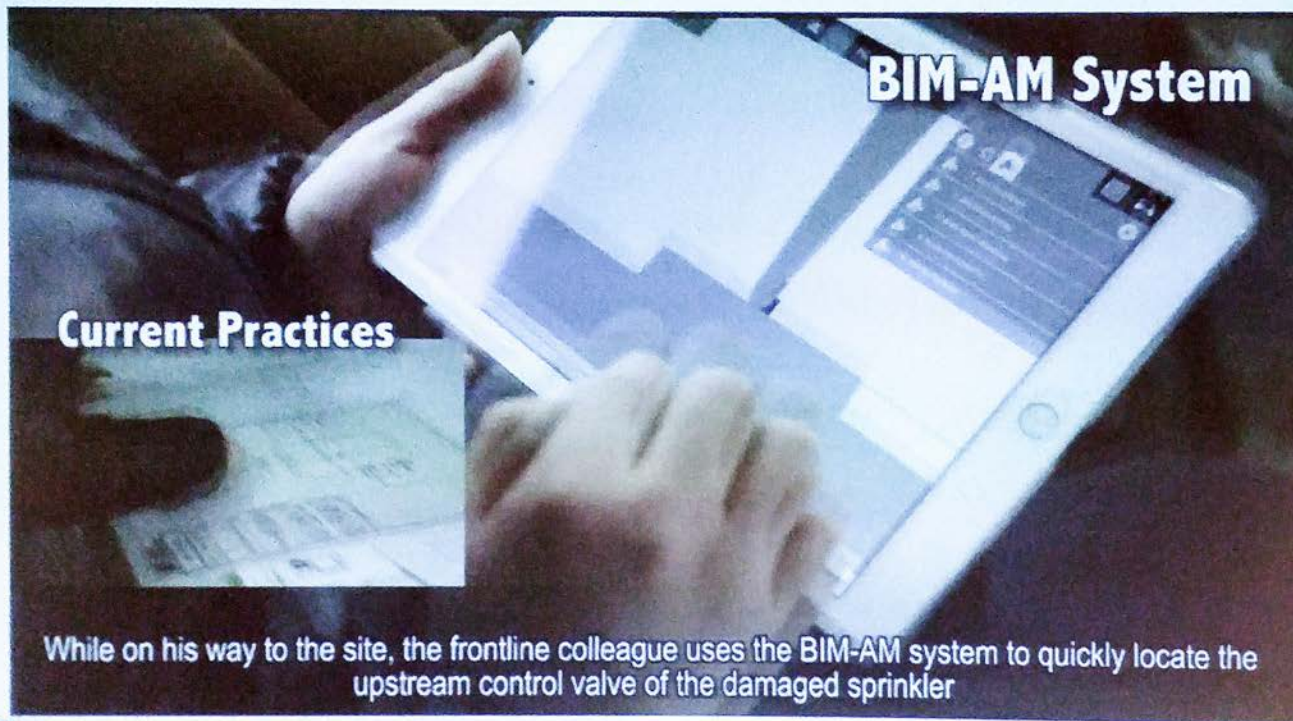


BIM-AM System

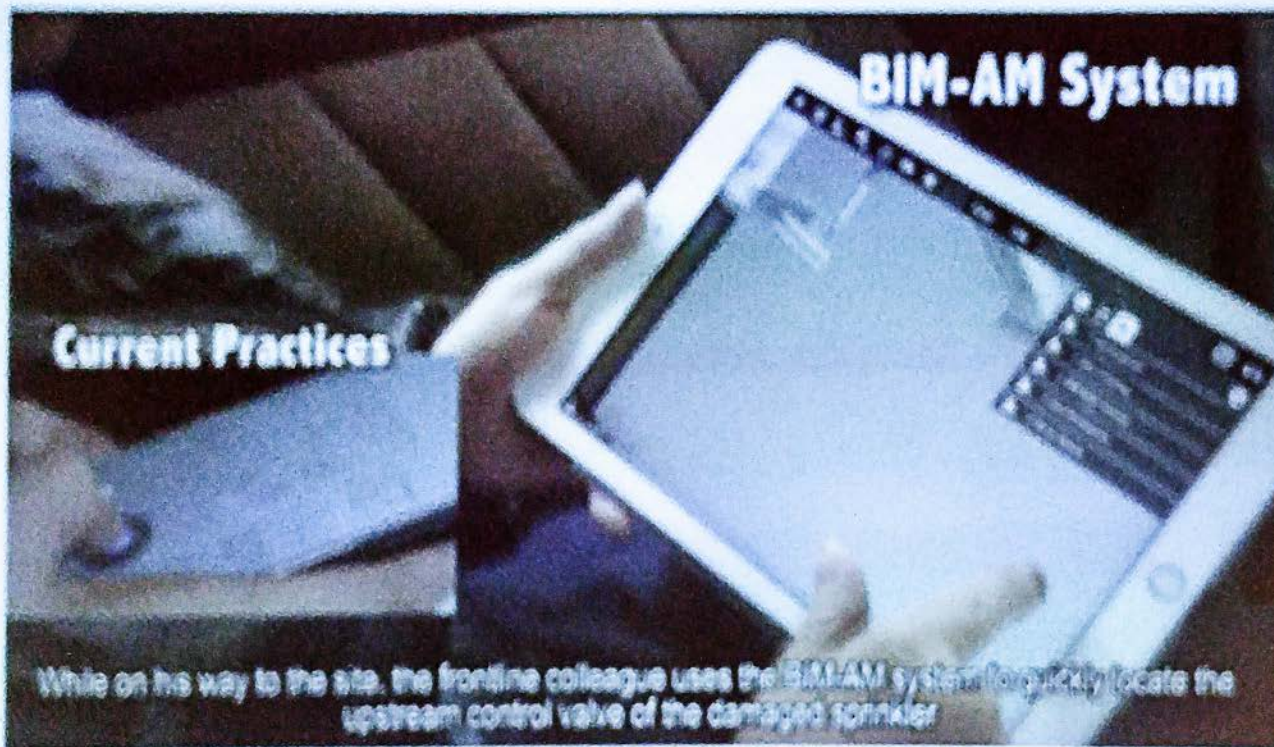


The Contractor's supervisor now sends the case to his frontline staff via a mobile device.

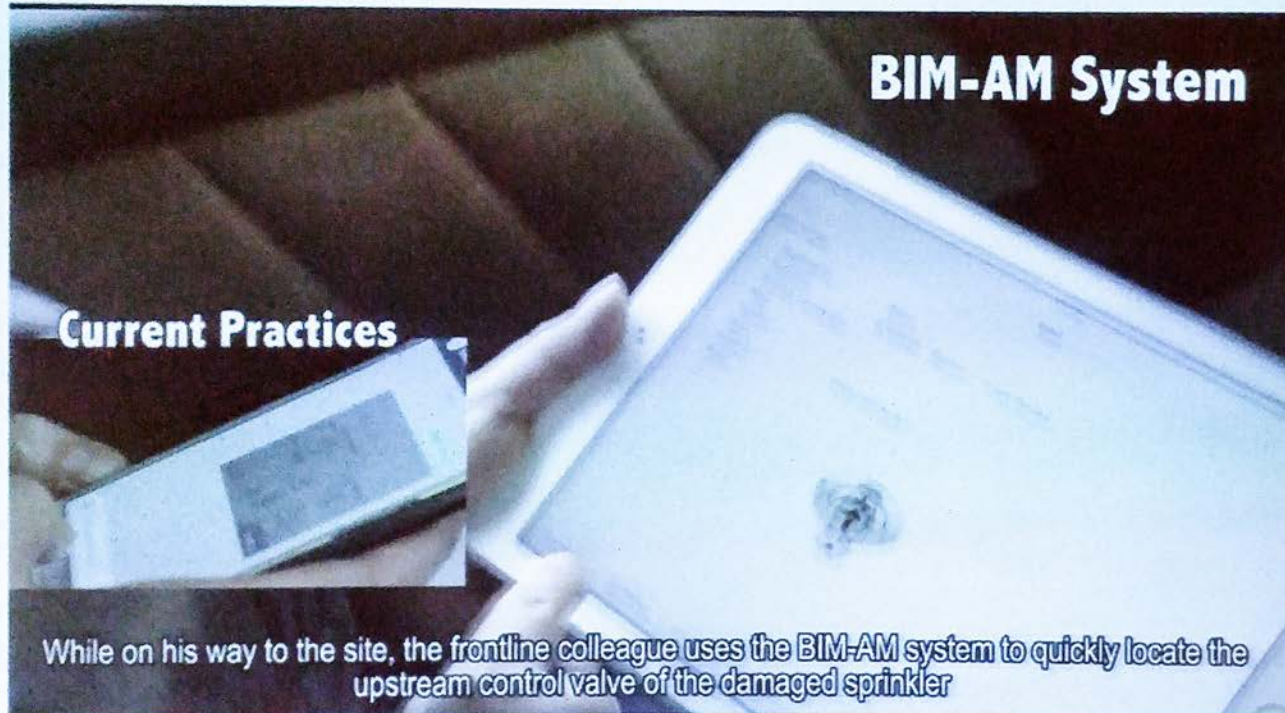
Incident Handling



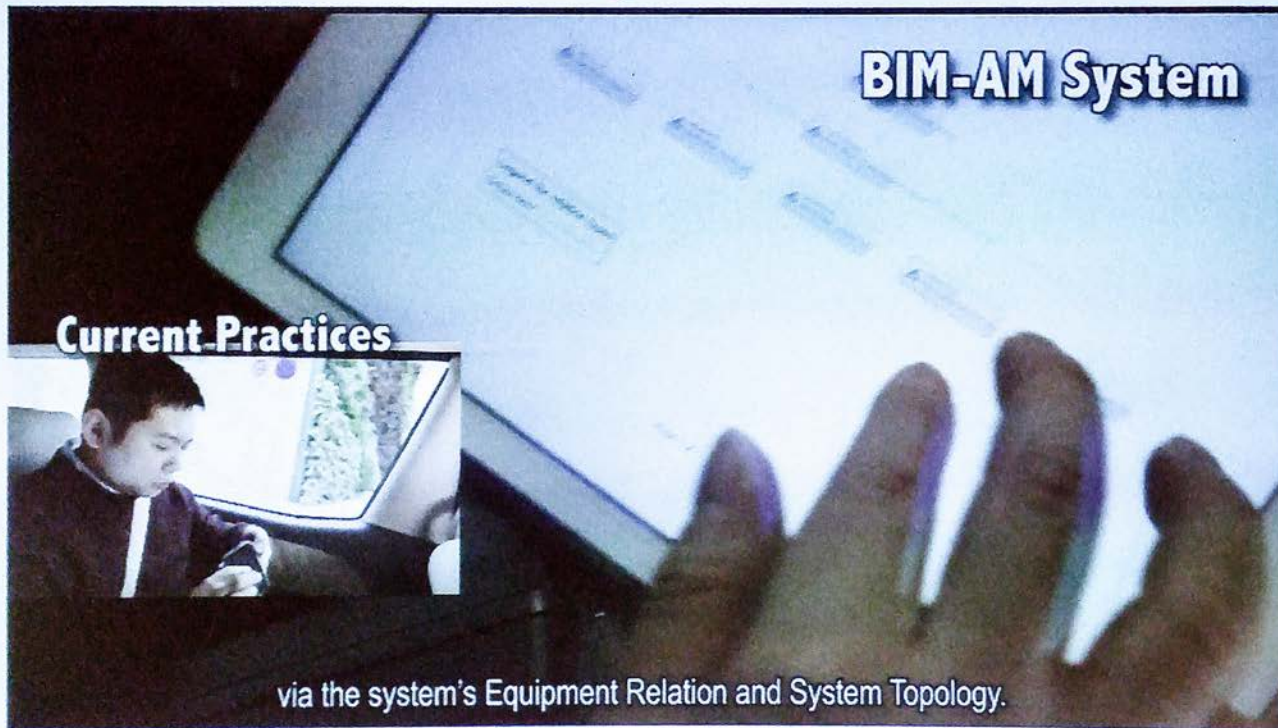
Incident Handling



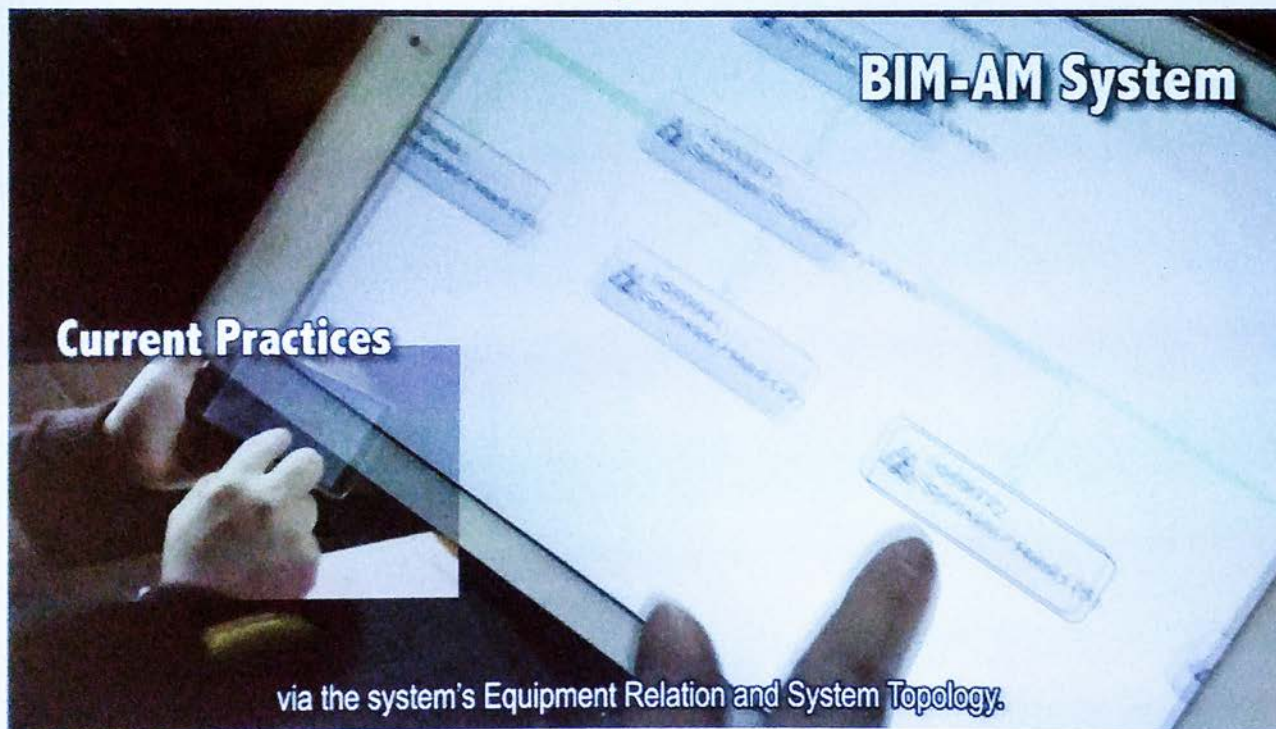
Incident Handling



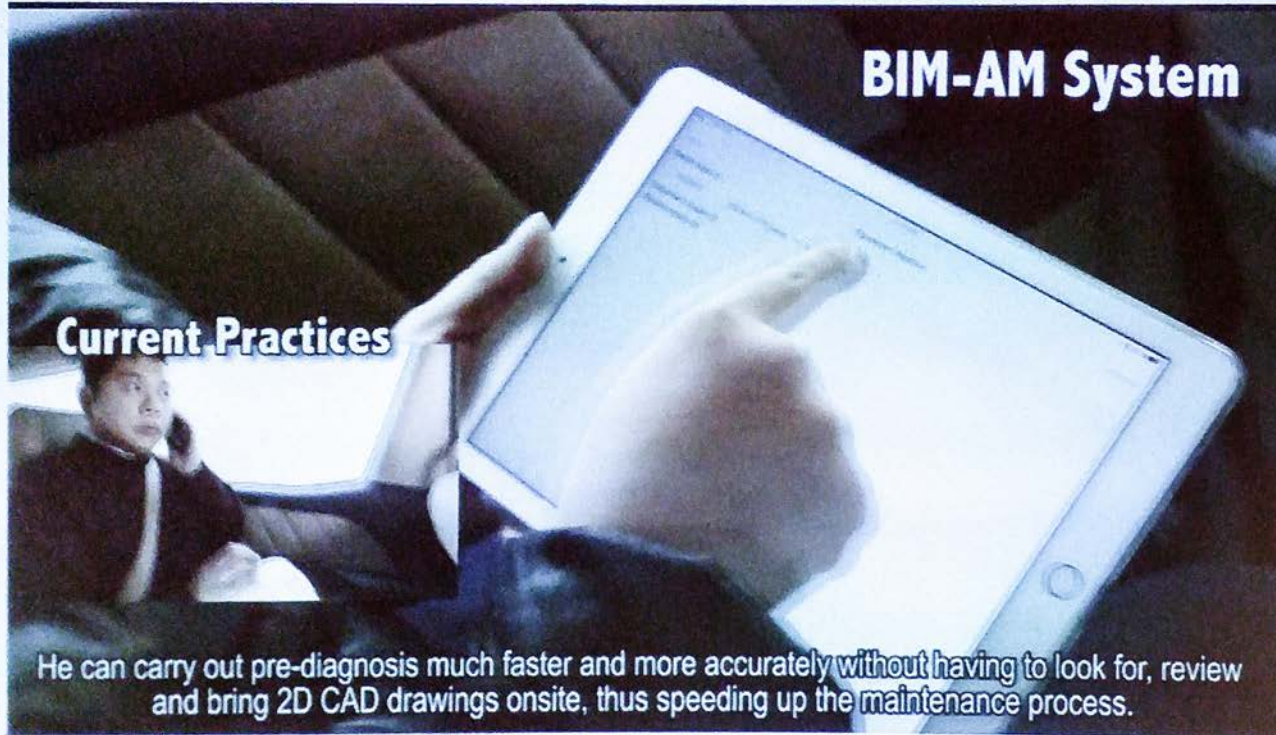
Incident Handling



Incident Handling



Incident Handling



Current Practices

He can carry out pre-diagnosis much faster and more accurately without having to look for, review and bring 2D CAD drawings onsite, thus speeding up the maintenance process.

Incident Handling

BIM-AM System

Current Practices

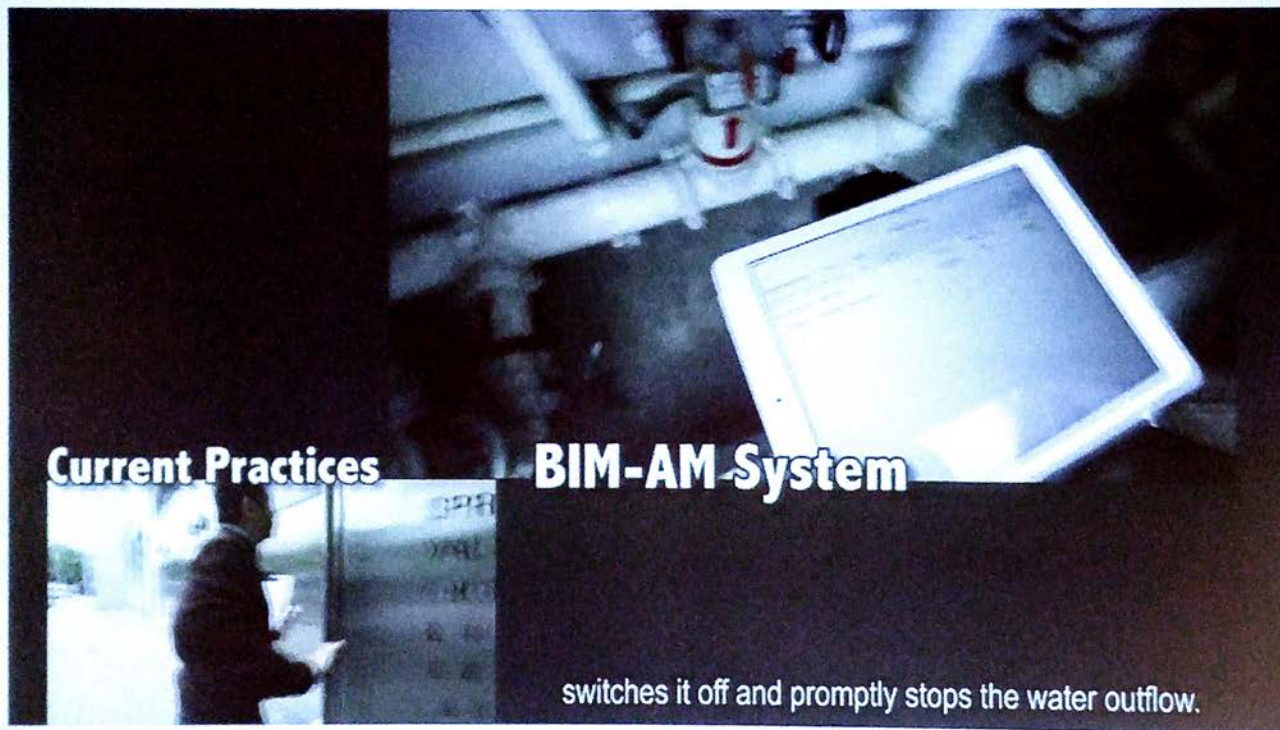
A person is shown using a tablet to view a 3D BIM model of a building structure. The model is displayed on the tablet screen, showing a complex network of pipes and structural elements. The person's hand is visible, interacting with the tablet. The background is dark and out of focus.

He can carry out pre-diagnosis much faster and more accurately without having to look for, review and bring 2D CAD drawings onsite, thus speeding up the maintenance process.

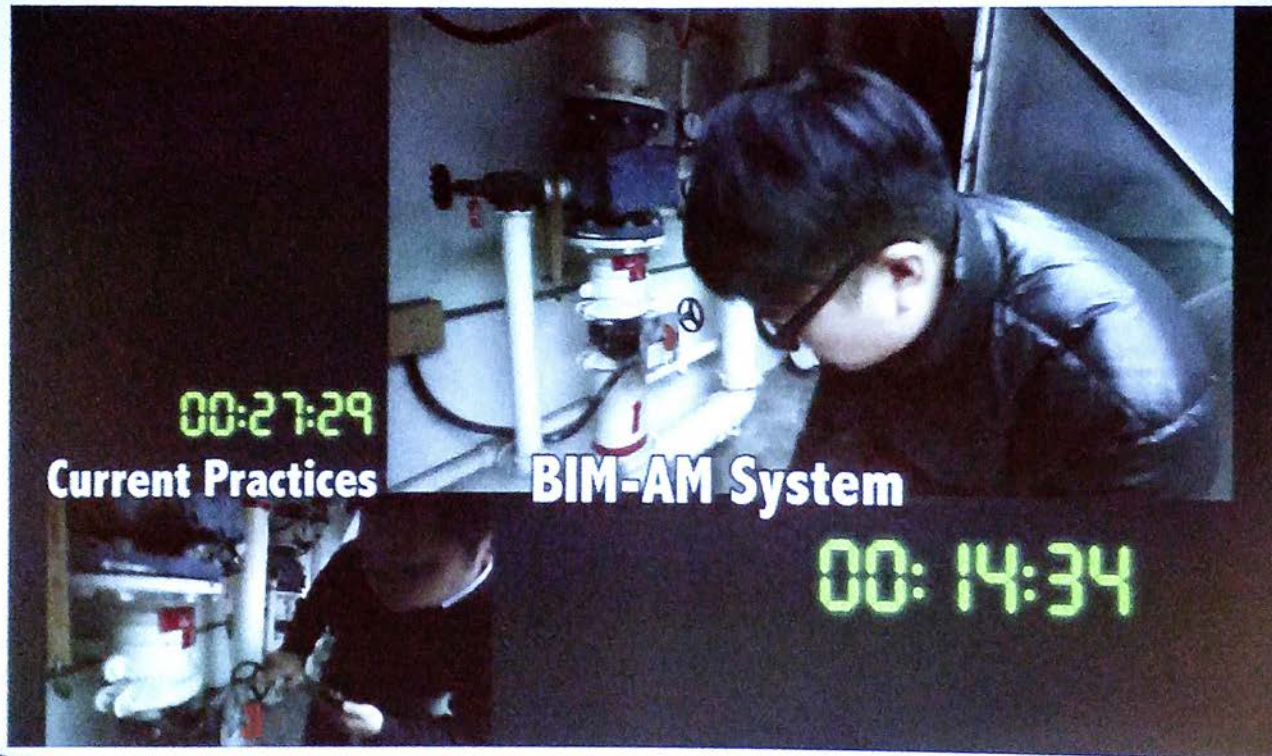
Incident Handling



Incident Handling



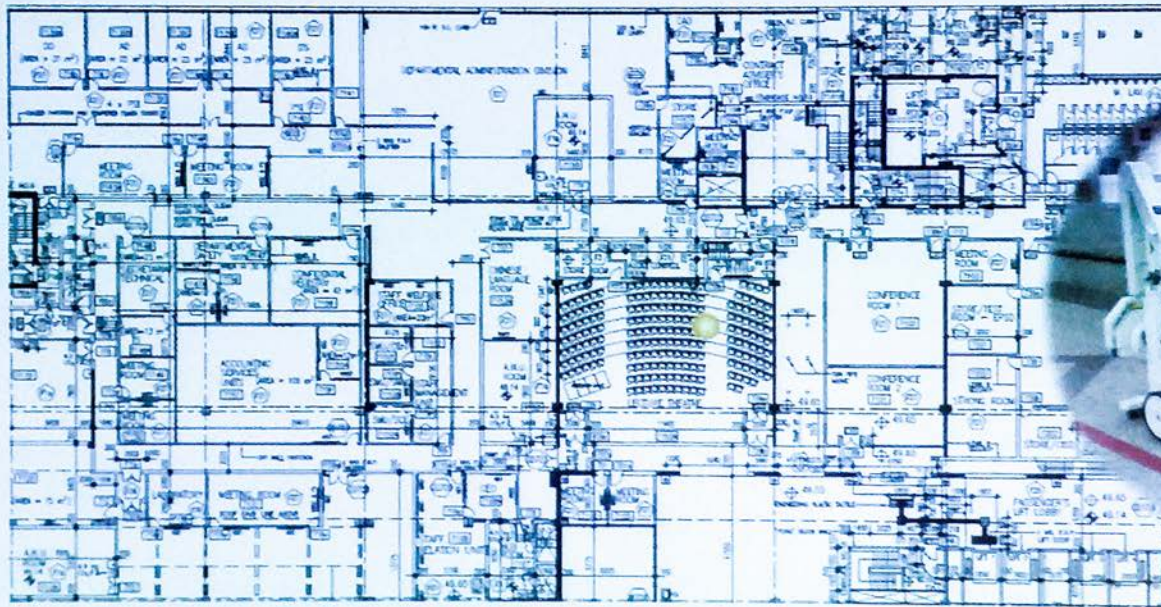
Incident Handling



Incident Handling



Interfacing with Real Time Location System (RTLS) for locating movable assets



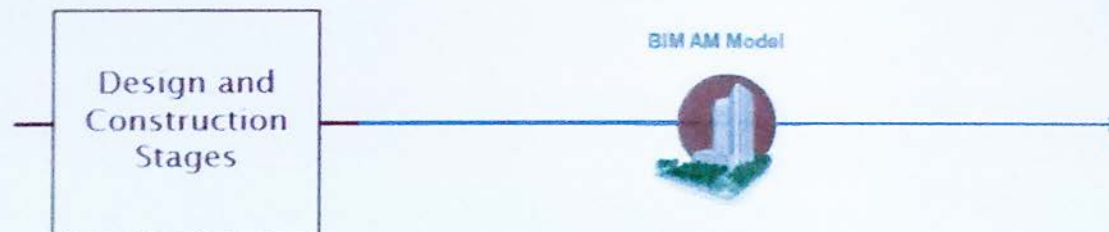
Outline

- ▶ EMSD BIM-AM System
 - Retrospective BIM model construction
 - System architecture illustrated by showcases
- ▶ **Way forward**
 - Drawing standard
 - Contractor submission guidelines
 - 5 Centre of Excellence (CoE) sites for BIM-AM
 - Integrating with Geographic Information System (GIS)
 - Smart glasses (Augmented Reality)

Way Forward

- ▶ How to adopt BIM for building asset management (AM) & operation & maintenance (O&M)?
 - Early coordination at design & construction stages

90% time of building lifecycle



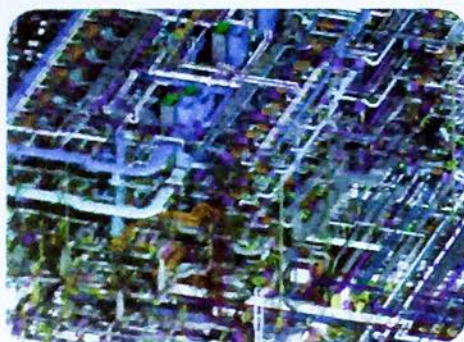
Way Forward

- ▶ Drawing standards



Way Forward

- ▶ Drawing standards
 - Colour scheme



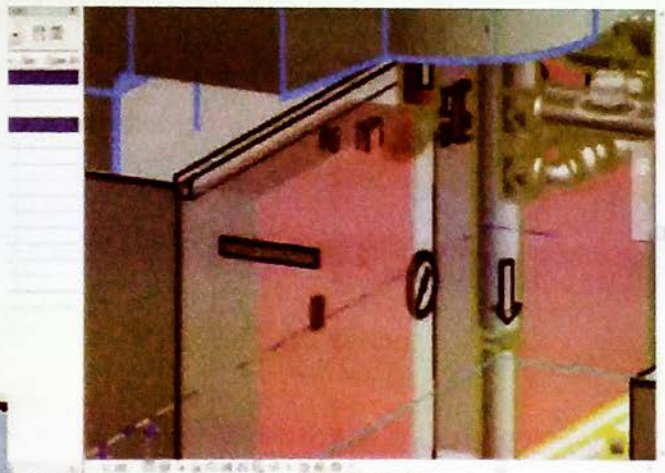
Way Forward

- ▶ Drawing standards
 - Colour scheme
 - Separation of MEP subsystems in BIM model

Way Forward

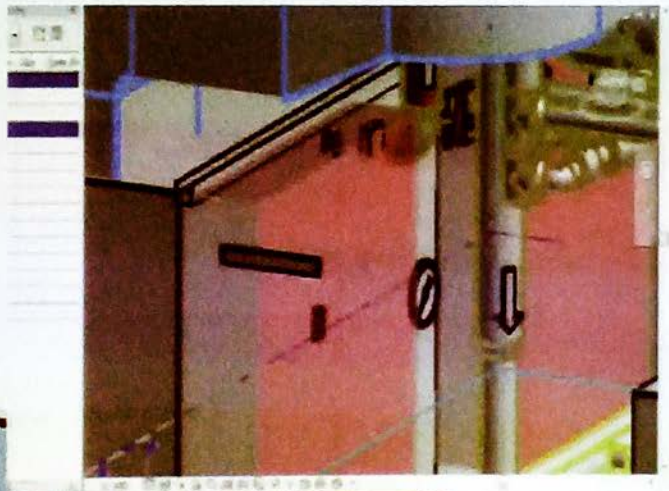
► Drawing standards

- Colour scheme
- Separation of MEP subsystems in BIM model
- Visualization of maintenance clearance



Way Forward

- ▶ Drawing standards
 - Colour scheme
 - Separation of MEP subsystems in BIM model
 - Visualization of maintenance clearance



Way Forward

- ▶ Contractor submission guidelines

Way Forward

► Contractor submission guidelines

◦ Asset information requirement using EMSD standardized asset templates

1. LVSB
2. Emergency Generator Set
3. UPS
4. Lift
5. Escalator
6. Burglar Alarm and Security System
7. Broadcast Reception System
8. HVAC Installation
9. Electronics Timing & Display Installation
10. Audio Electronics Installation
11. Video Electronics Installation
12. Radio Electronics Installation

Equipment No.	Equipment type	Parent Equipment 1	Associated Equipment 1	BIM GUID	RFID No.	Switchgear No.	Type of Circuit	Rating (A)	Make
123456	Switchgear (ACB)					6N1	Incipient	3200	Elison
123457	Switchgear (MCCB)					6N2	Sub-main (Normal)	400	Merlin Gerin
123458	Switchgear (MCCB)					6N3	Sub-main (Normal)	800	Merlin Gerin

Way Forward

► Contractor submission guidelines

- Asset information requirement using EMSD standardized asset templates
 - E.g. asset relationship (parent-child / associated)

Equipment No.	Equipment type	Parent Equipment 1	Associated Equipment 1	BIM GUID	RFID No.	Switchgear No.	Type of Circuit	Rating (A)	Make
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123457	Switchgear (MCCB)					6N2	Sub-main (Normal)	400	Merlin Gerin
123458	Switchgear (MCCB)					6N3	Sub-main (Normal)	800	Merlin Gerin

Way Forward

▶ Contractor submission guidelines

- Asset information requirement using EMSD standardized asset templates
 - E.g. asset relationship (parent-child / associated)
 - E.g. RFID tagging requirements, e.g. critical assets

Equipment No.	Equipment type	Parent Equipment 1	Associated Equipment 1	BIM GUID	RFID No.	Switchgear No.	Type of Circuit	Rating (A)	Make
123456	Switchgear (ACB)					6N1	Incomer	3200	Elison
123457	Switchgear (MCCB)					6N2	Sub-main (Normal)	400	Merlin Gerin
123458	Switchgear (MCCB)					6N3	Sub-main (Normal)	800	Merlin Gerin

Way Forward

- ▶ To establish 5 Centre of Excellence (CoE) sites in EMSD for internal promotion of BIM-AM application in O&M

Way Forward

- ▶ Integrating with GIS for a holistic geographic interface for easy management of venues maintained under BIM-AM System



- Peter Koncz

supporting organisations:

ALLGAIN  enzyme. GRAPHISOFT

HKIBIM
Annual Conference
2016

DATE
6th October, 2016 (Thursday)
TIME
8:45 a.m. - 5:00 p.m.
VENUE
Royal Plaza Hotel
Conference - Grand Ballroom
Lunch - La Scala, Level 2

HKIBIM
Annual
Conference
2016

The Hong Kong Institute of
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! Thank you !