



ENGINEERING GREEN TECHNOLOGY – DRIVING SUSTAINABILITY AND INNOVATION

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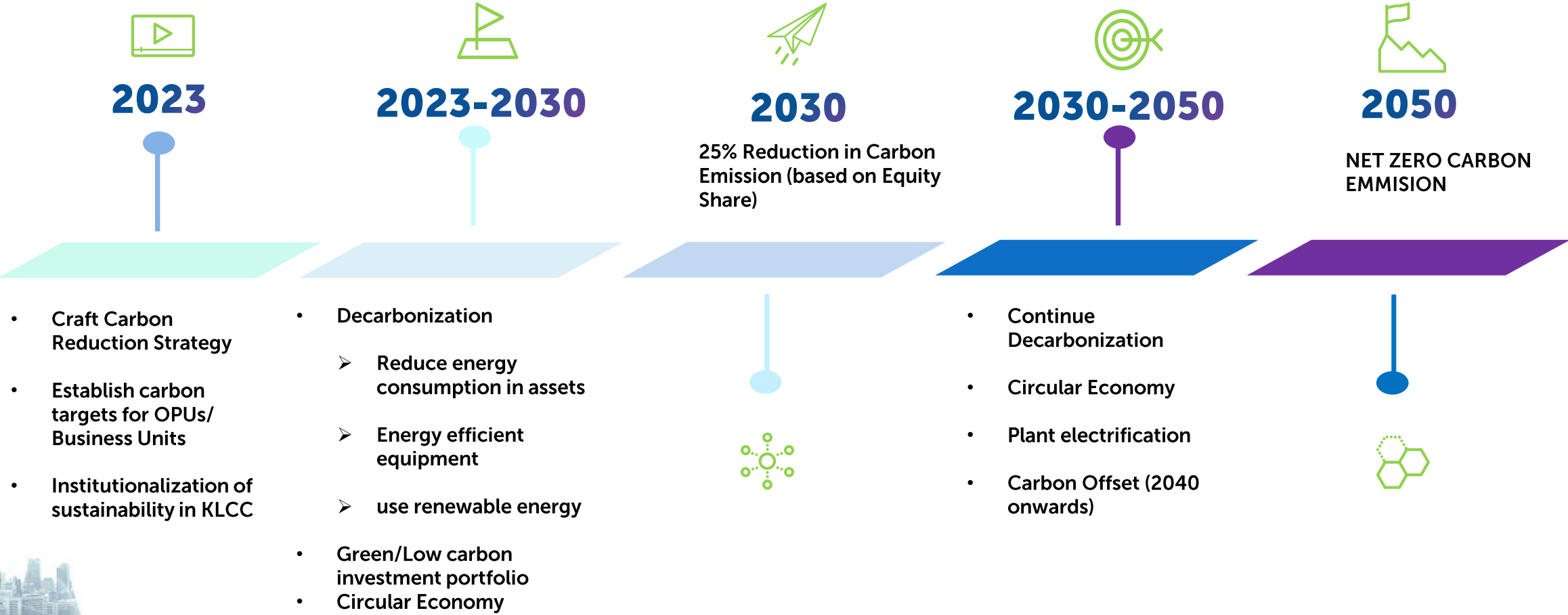
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OUR JOURNEY TOWARDS SUSTAINABILITY



KLCC Group aspires to achieve Net Zero Carbon Emission by 2050 supporting PETRONAS



In continuously driving sustainability and embracing innovativeness , several initiatives have been implemented including the followings:

- External Facade Lighting Modernization at PETRONAS Twin Towers (PeTT)
- Establishment of Integrated Building Command Center (IBCC)





FACADE LIGHTING



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Overview of External Facade Lighting



The existing external lightings with flood light concept has been in operations for more than 20 years. The lightings were designed to illuminate and reflect the steel and glass of the façade material and with silhouette effect.



Daily Operation hours is 6 hrs. from 7 pm to 12 am.

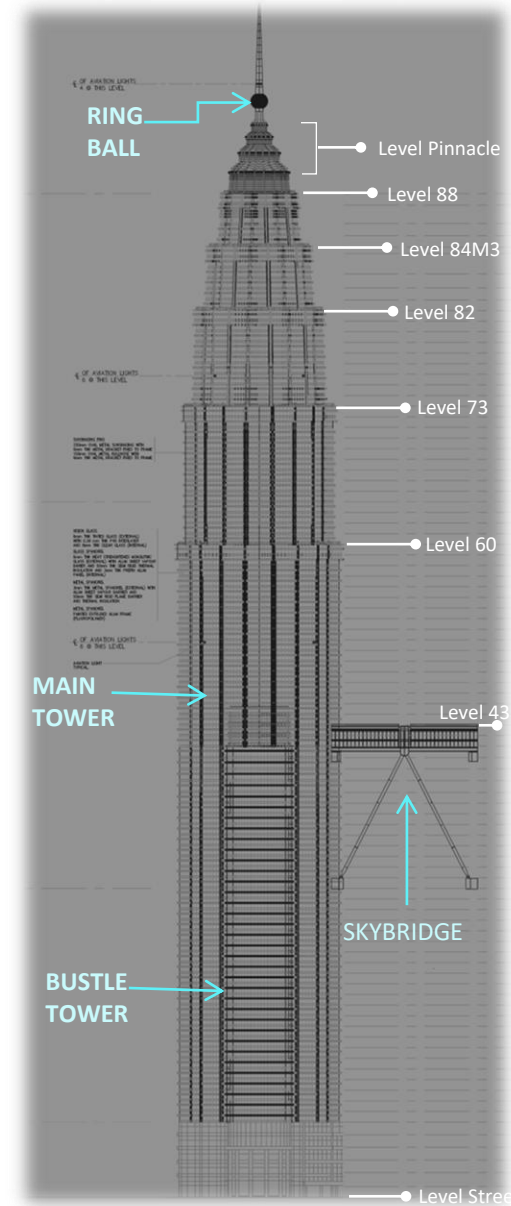


On special occasions such as Merdeka Day, Malaysia Day and New Year Day, the lightings are extended to 1 am.



Previous conventional lighting require special set up and additional cost to accommodate request to color the Towers according to the occasions.

Review of Night Atmosphere Facade Lighting



After years of operations, the metal halide lightings performance have declined with high energy consumption & high maintenance cost.



Conventional Lighting System including Metal Halide bulb and ballast

- High electricity consumption
- Effect the power factors and maximum demand due to high wattage
- Draw a lot of current during startup and have a shorter lifespan on average of 3,000hrs
- Expensive to maintain – maintenance & parts replacement at RM2.8 Mil/year
- Declining performance

No colour changing feature

- Require special setup and extra cost each time to set up for event



Modernization of External Lighting provides potential reduction in electricity consumption, longer life span and colour changing features



Saving of Electricity power consumption



- Minimum 50% as savings relative to existing external lighting system
- LEDs are Super-Efficient and Less-Heat emission

Reduce annual maintenance cost



- 5 years warranty
- Dimming features
- Less risk of damage (using high quality eco-friendly materials)

Cost saving in schedule waste management



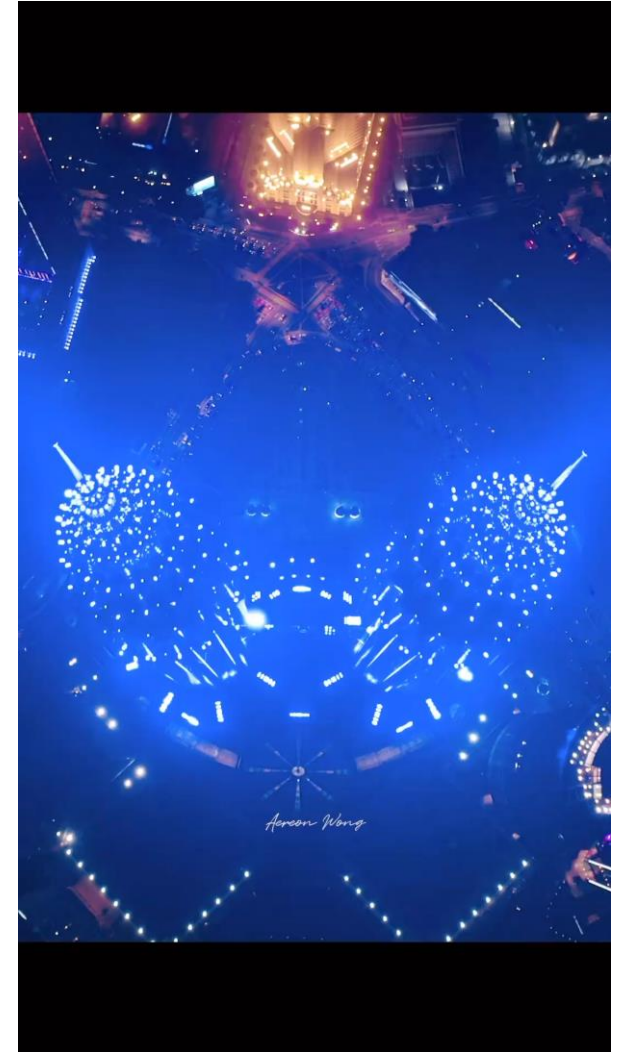
- LED is mercury free

More light for less energy



- Color changing features
- 800% more light with LED fixtures
- Multi-color support
- Flexible ideas with numerous designs

The outcome of the building façade lighting featuring color changing ability in accordance with the special events requests



The outcome of the building façade lighting modernization contributes savings in energy usage more than 50%



Details	1800W Metal Halide	New 770W LED
Cost	RM Mil	RM Mil
Investment Cost	2.52	24.8
Maintenance	2.10	-
Energy (actual reading)	2.35	0.64
Cost Savings p.a.		3.81
Break even (years)		6.5
Analysis of Cost	RM Mil	RM Mil
Energy & Maintenance p.a.	4.45	0.64
Energy & Maintenance 20Y	88.99	12.84
System + EM20Y	91.51	37.64
Cost Savings during Lifespan		53.86



INTEGRATED BUILDING COMMAND CENTRE (IBCC)



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INTRODUCTION TO IBCC

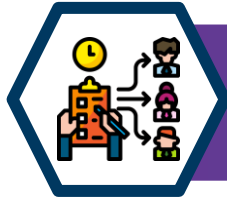
Integrated Command Centre
To manage our facilities from
a centralized location

Serves as the platform to enable
Real-Time Operations and
Automation

INTEGRATED BUILDING COMMAND CENTRE



Some pain points which spark the need for change



Building Management System is managed by individual buildings



Our systems were isolated and mostly standalone



Low visibility due to data being scattered in various locations



Manual work processes leading to inefficiency of operations



Tenants' frustration

IBCC Features



IBCC was designed in a modular way to monitor and control some key services and subservices as below:

Energy Management



Life & Safety



HSSE



Automation System



CCTV



Vertical Transportation (VTS)



Sensor Monitoring System



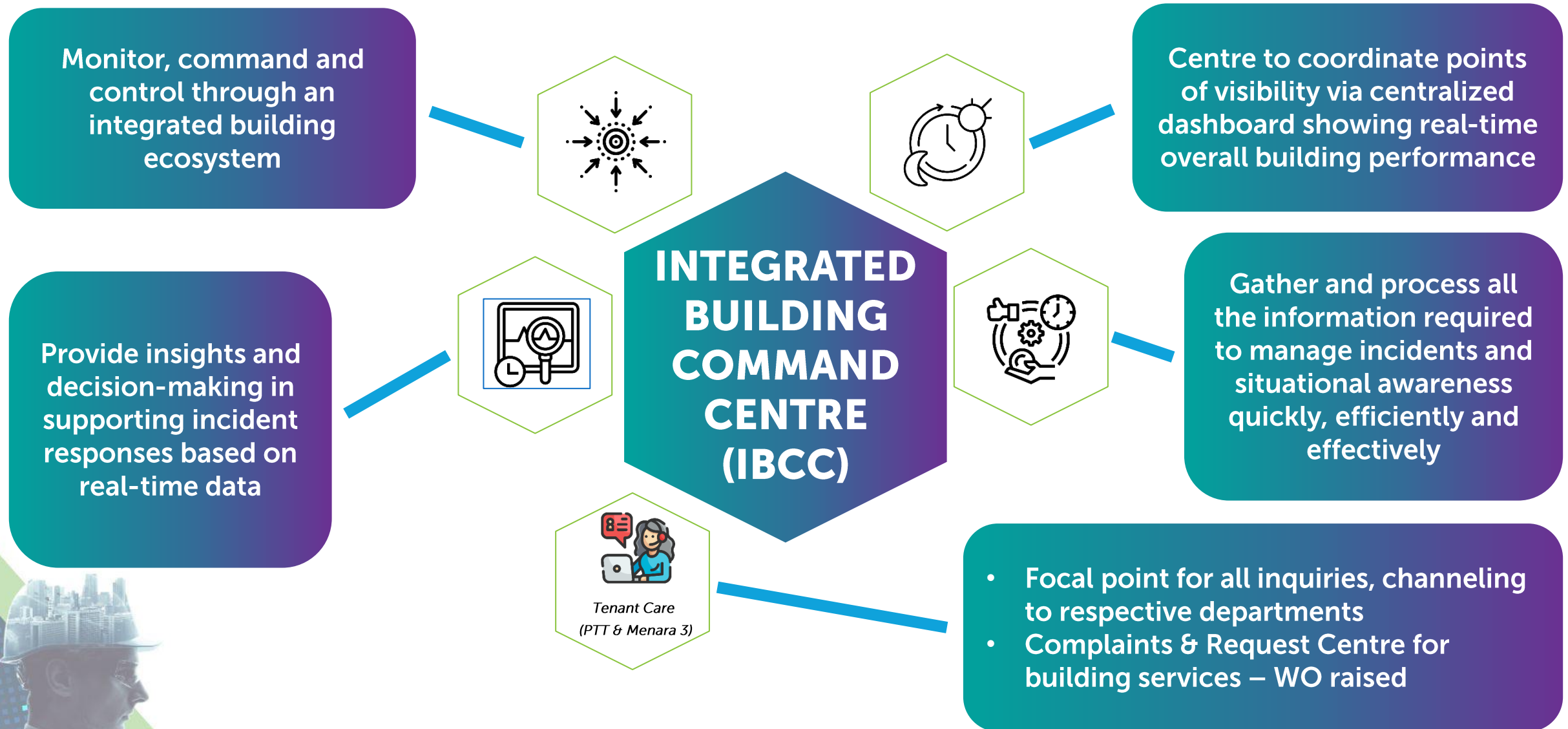
Chilled Water System



Work Order Management System (WORMS)



KEY FUNCTIONAL STRUCTURE (IBCC)



Managing KLCC Park Digitally via System Automation



Reduce risk of working at

Height & in Confined Spaces

Switching and Monitoring of all Pump Rooms

Manual



Remote
Operation

93%

Reduction of Activities

8,760
activities

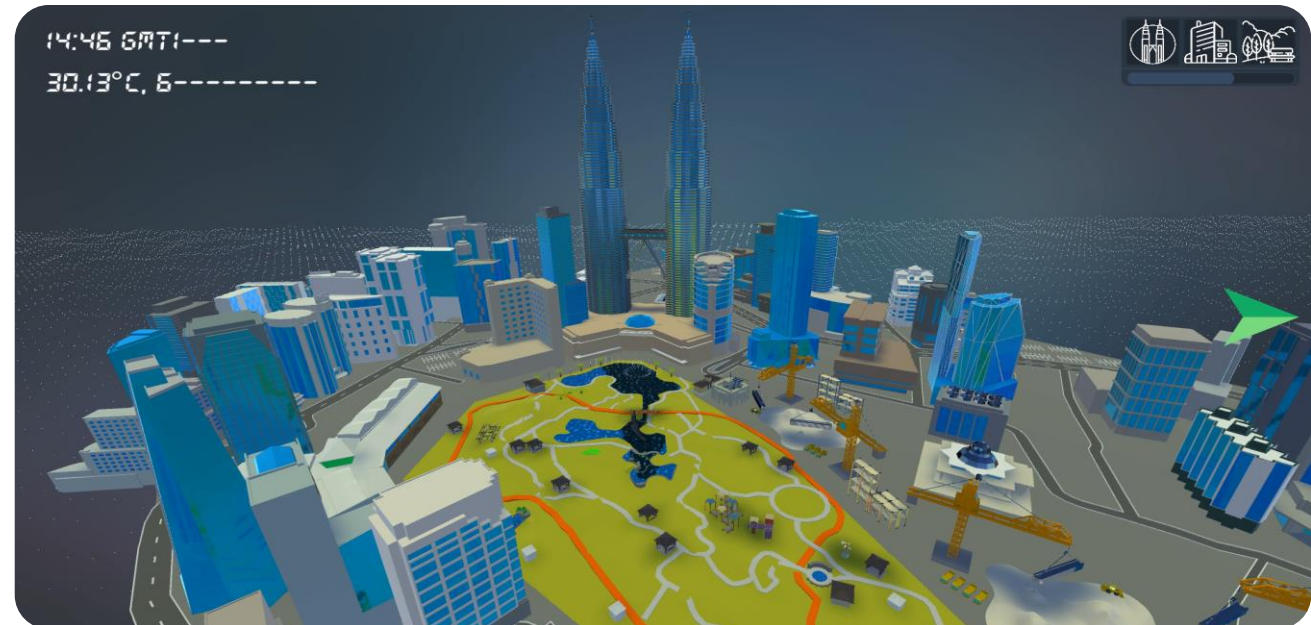
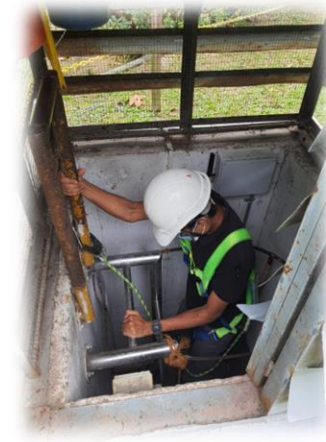


624
activities

Reduce



- Cost
- Risk



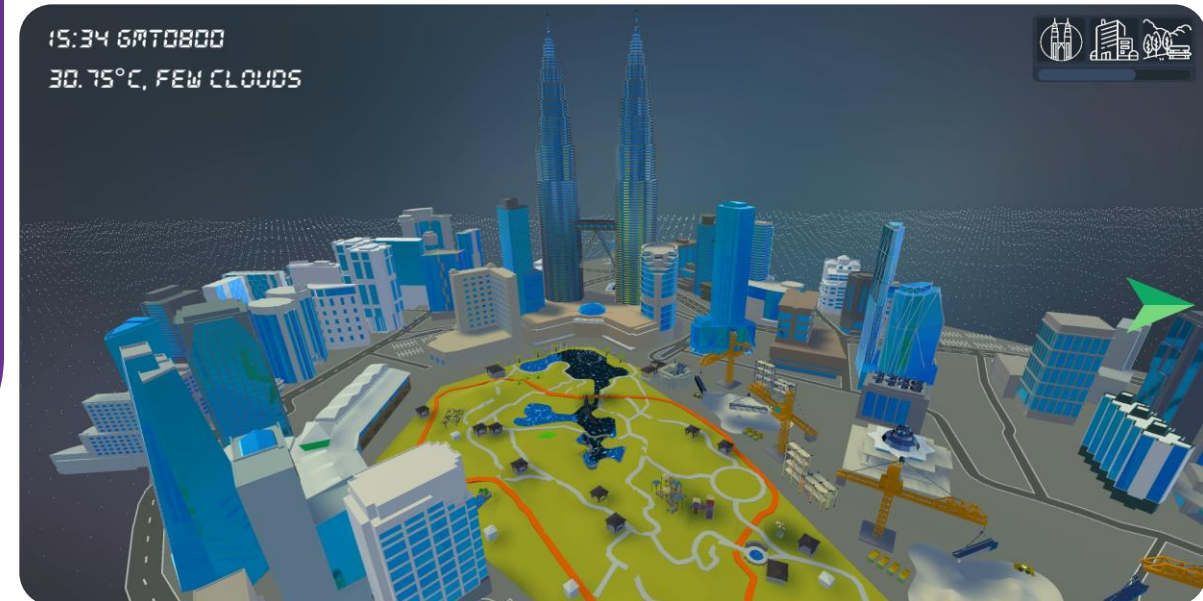
AHU Monitoring Systems (Tenant Satisfaction)

We often ask:

"Are our tenants comfortable in our building?"

Air Handling Units (AHU) are monitored on a real-time basis.

- Determine the zones which space temp exceeds the required setpoint temp, and act proactively
- Adjusting of temp setpoint seamlessly without having tenants to raise request/complaint

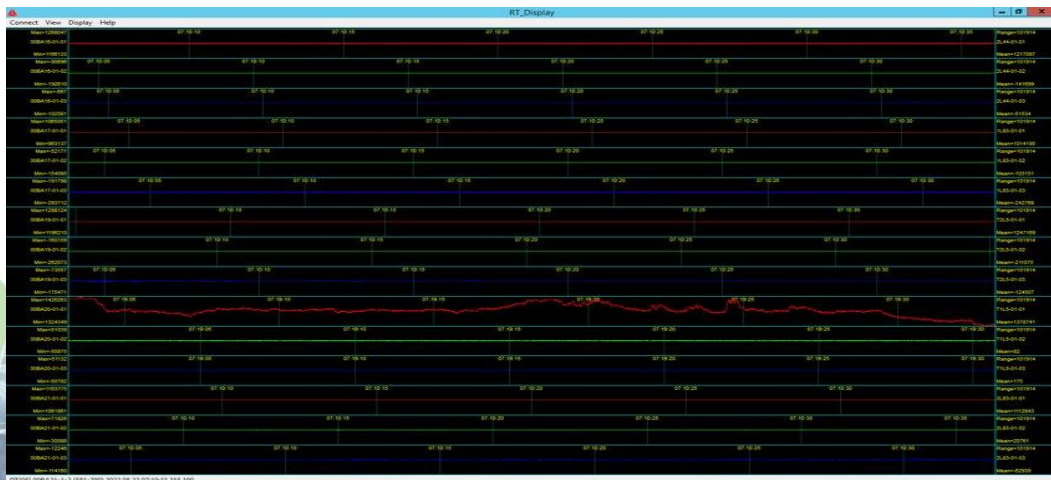


Structural Monitoring System (SMS)

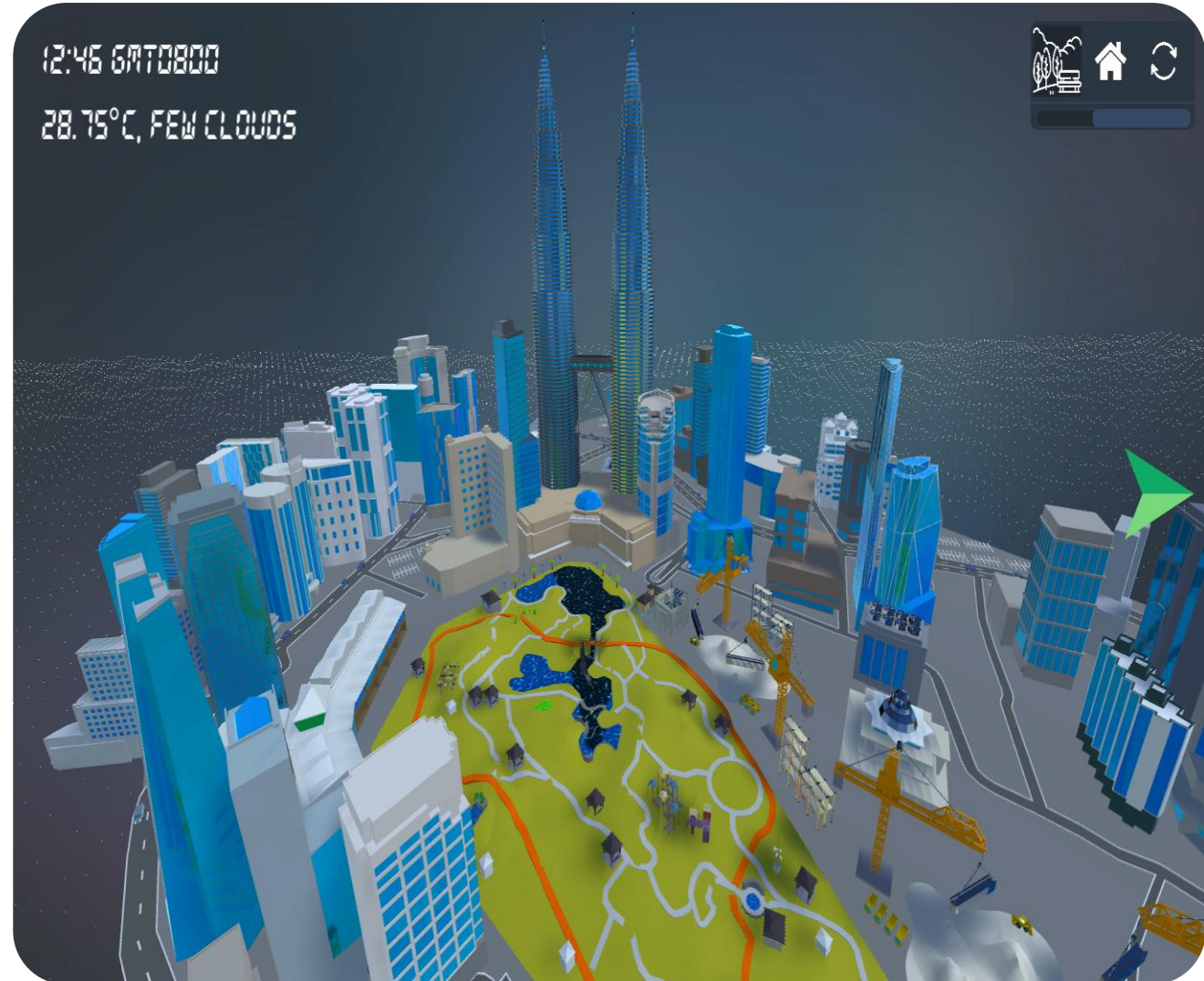


Real-time information and data collection

- Move from Quarterly reporting to real time reporting
- Monitoring of building sway & vibration
- Alarm threshold for proactive monitoring



PREVIOUS DASHBOARD



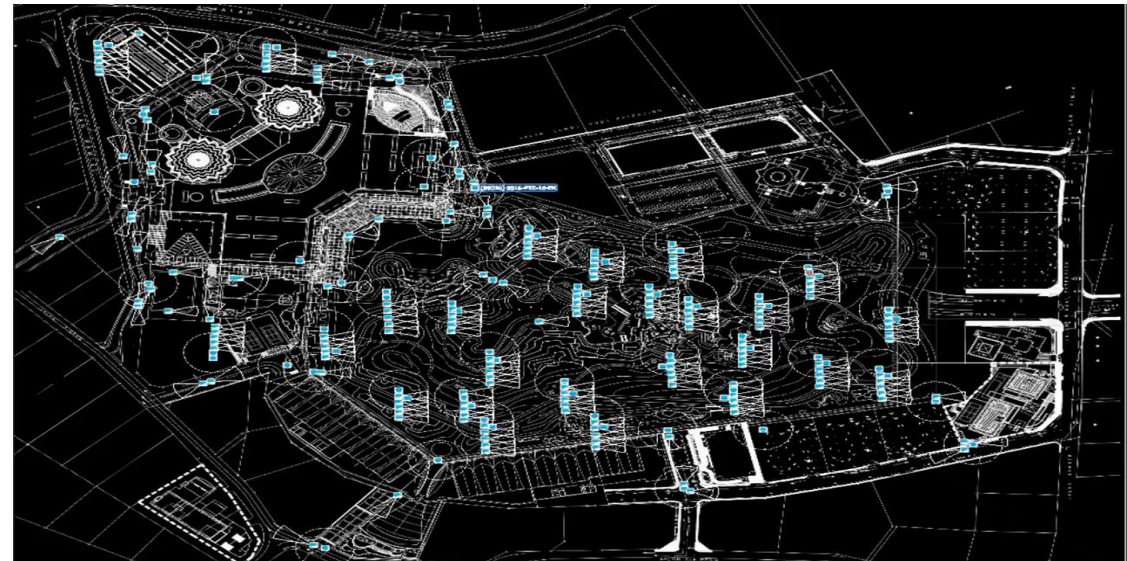
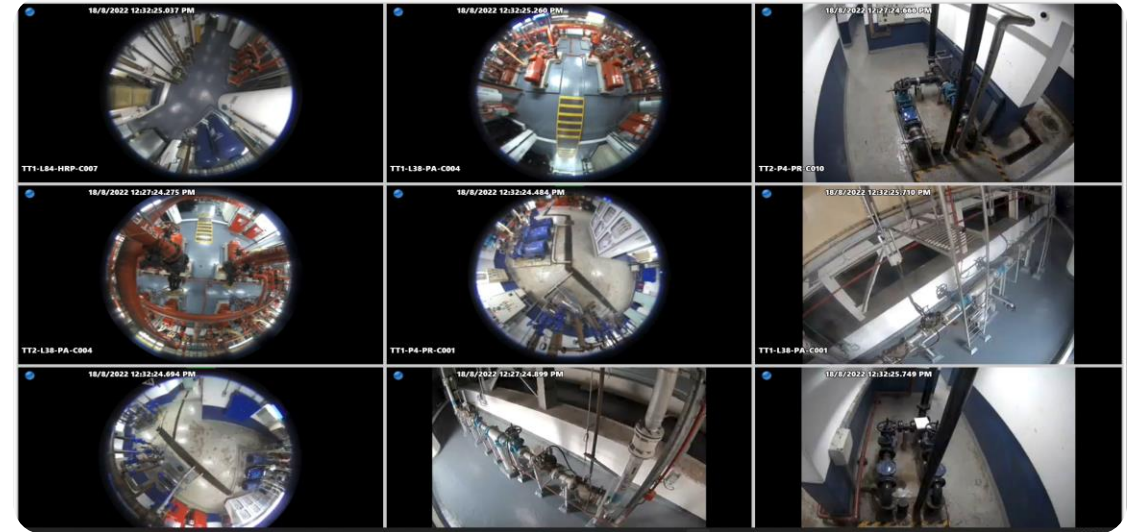
NEW & IMPROVED DASHBOARD

CCTV Monitoring Systems



Monitoring of the CCTVs on Mechanical Floors & KLCC Precinct Security Management Center(KPSMC)

- 24/7 Surveillance
- Motion detection

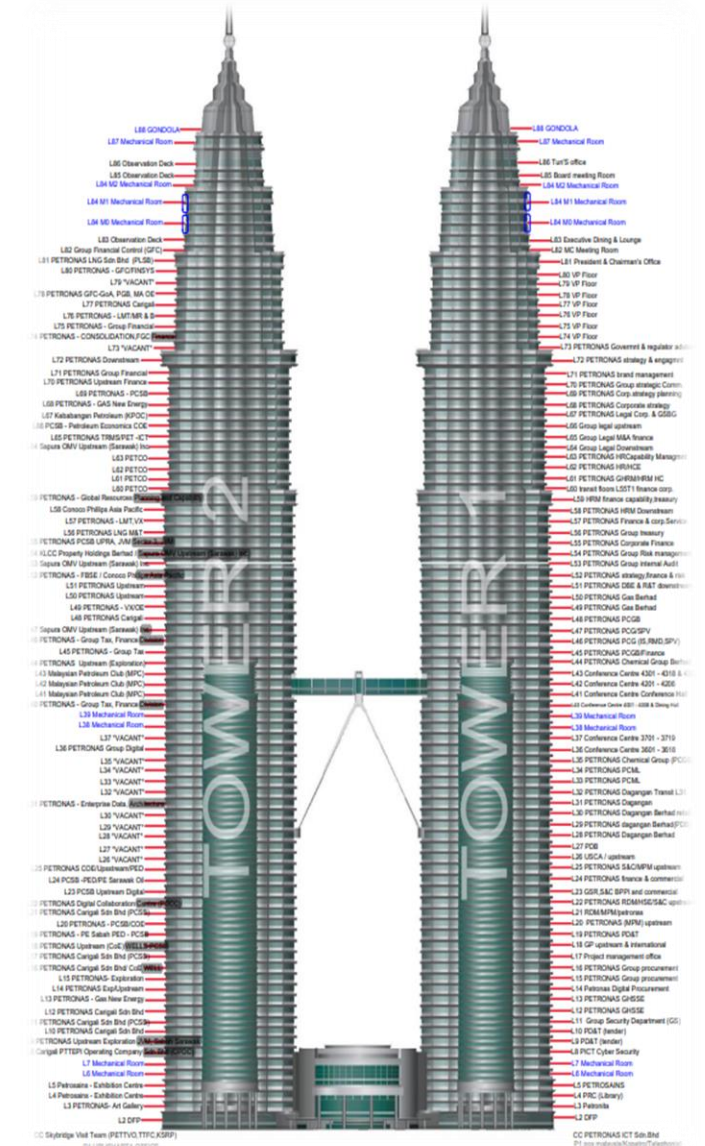
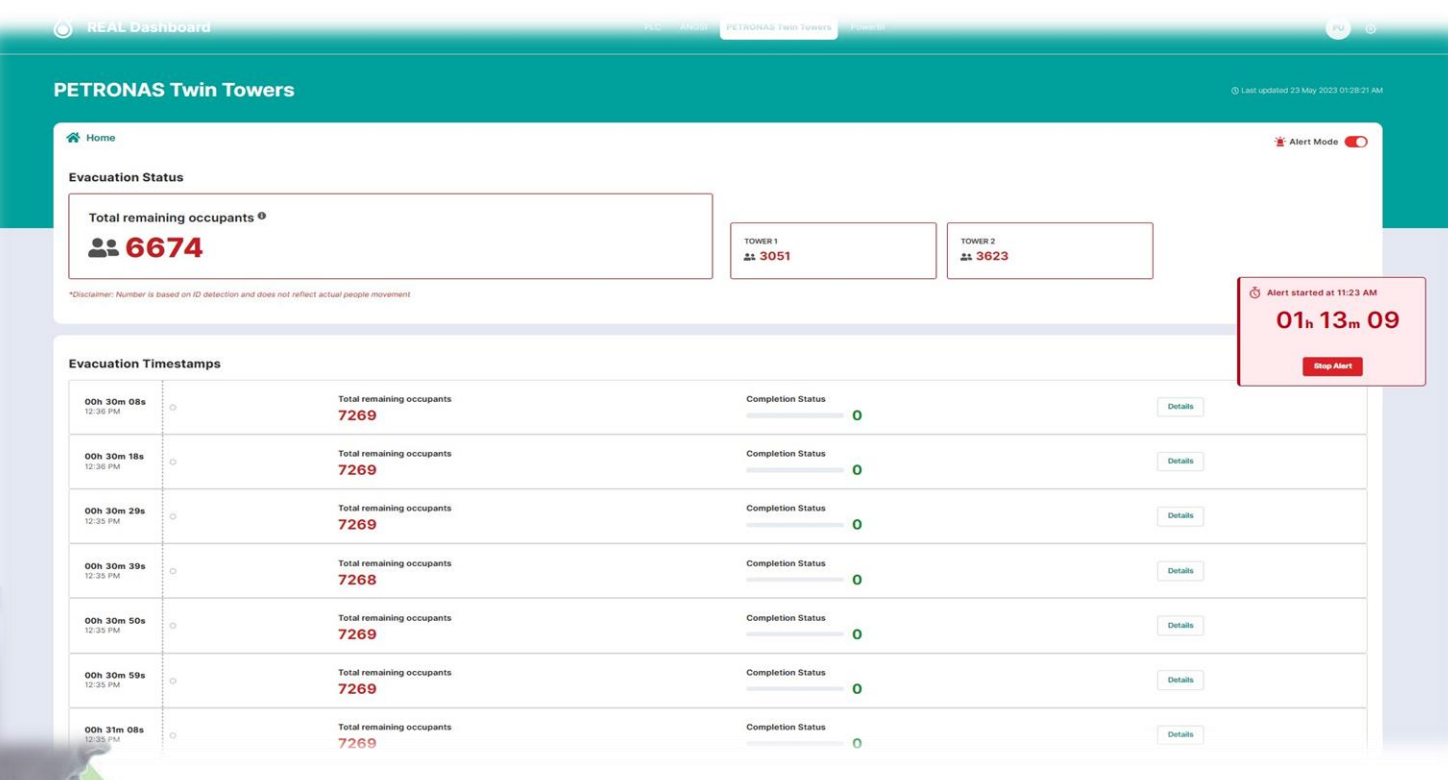


Real – Time Headcount Monitoring



Viewing of the live headcount of tenants in the building through Card Access System

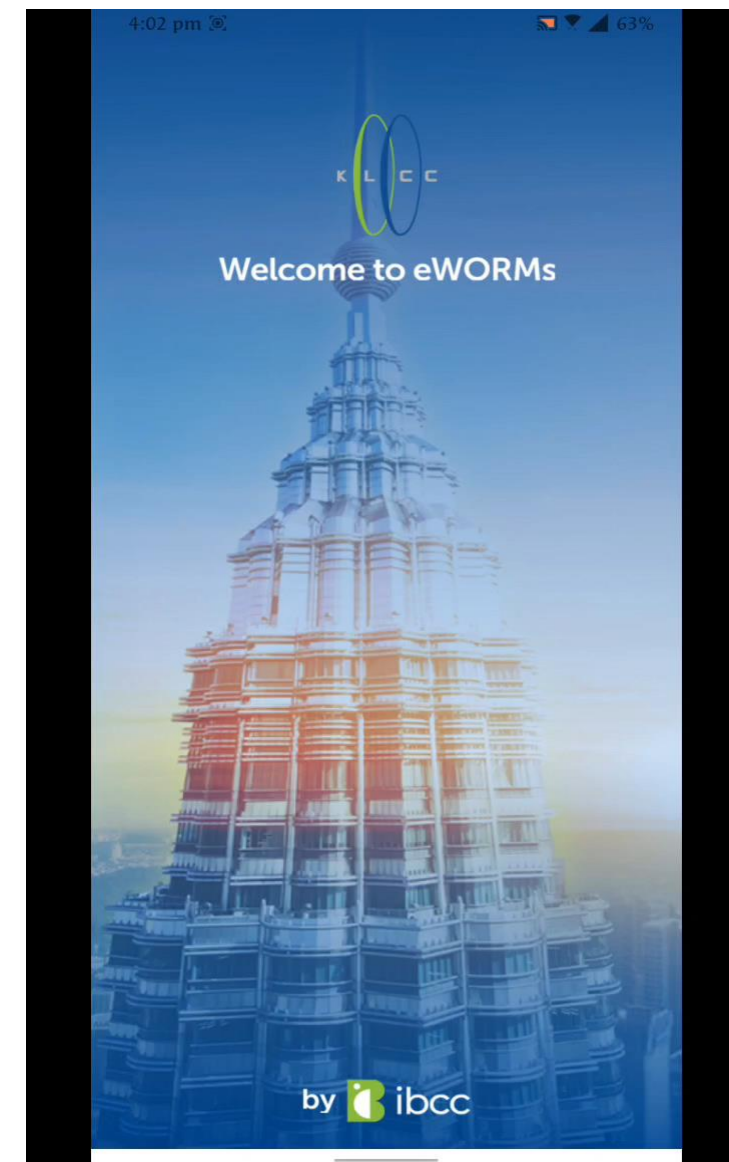
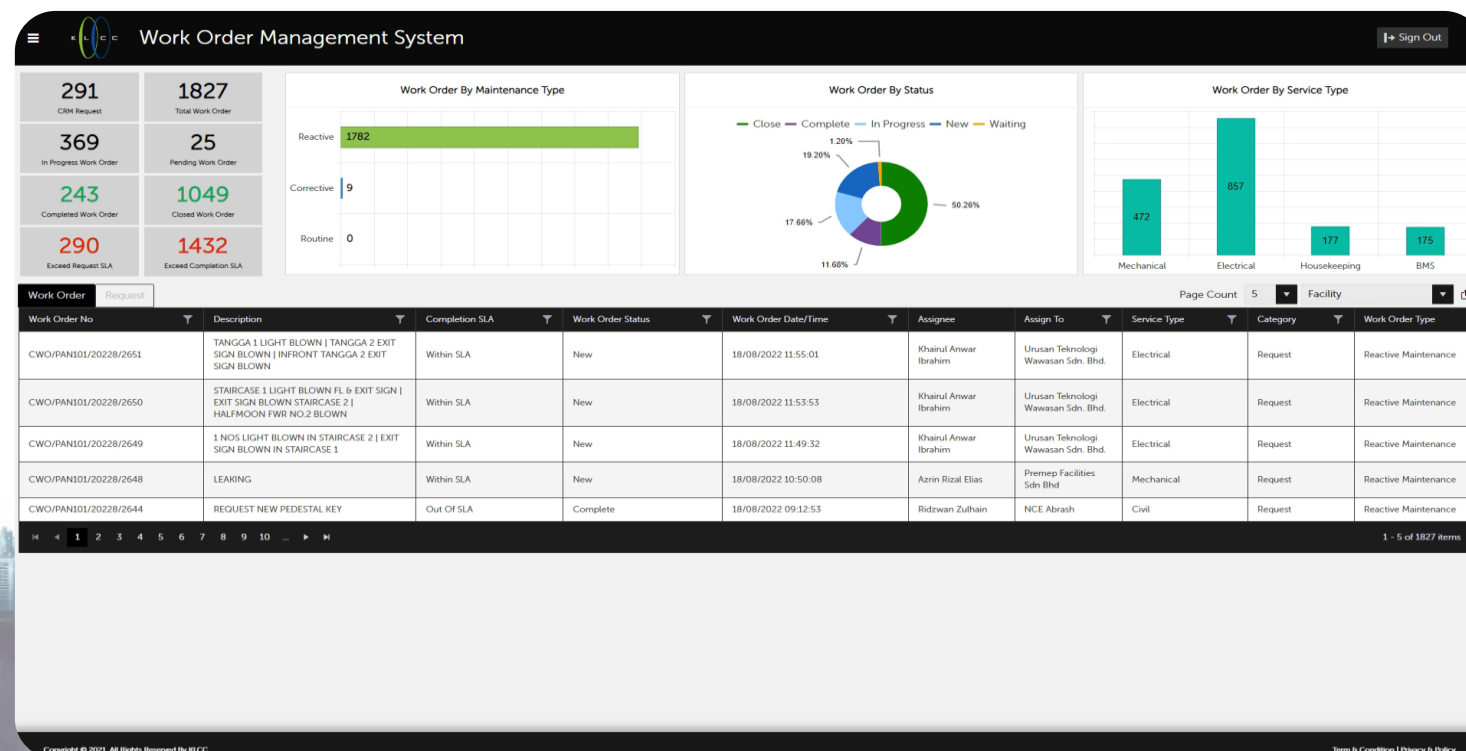
Ease of tracking on headcount through RFID at exit points during emergency/evacuation.



Work Order Management System



- Real-time notification and WO closure through a more efficient complaint management system
- Alarm threshold linked to Work Order System through automation





Q & A





THANK YOU



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