

TURKMENTEL 2024

**INNOVATIONS IN DIGITAL TECHNOLOGIES & CYBER
SECURITY SOLUTIONS:
SMART CITIES FOCUS**

**MOHAMED MOSELHY
GLOBAL SMART CITIES DIRECTOR**

NOVEMBER 14TH, 2024

SMART CITIES HELP ADDRESS CORE CHALLENGES

COST OF LIVING

 Energy Management
  Water Management
 25–80 liters of water saved per person per day



SAFETY

30–40% fewer crime incidents
 Surveillance
  Emergency Services



TIME

 Traffic/Transportation Management
  Smart Parking
 15–30 minutes shaved off the daily commute

JOBS

 Digital Administration
  Data-driven education
 Positive net impact on formal employment

ENVIRONMENT

 Environment Monitoring
  Waste Management
 10–15% reduction in GHG
10–20% reduction in Recycled solid waste

CONNECTEDNESS

Increase residents' connectedness to local government by 3x
 E-Governance
  IT connectivity

HEALTH

 Improved health treatment
  Smart Healthcare
 Upto 300 lives saved each year in a city of 5 million



OUTCOMES

Enhance resilience, sustainability, & quality of life ...

SMART CITIES PILLARS

Domain Applications



Safety & Security



Smart Mobility



Environment & Sustainability



Facilities & Utilities

SMART CITY FRAMEWORK

Cross Cutting Themes

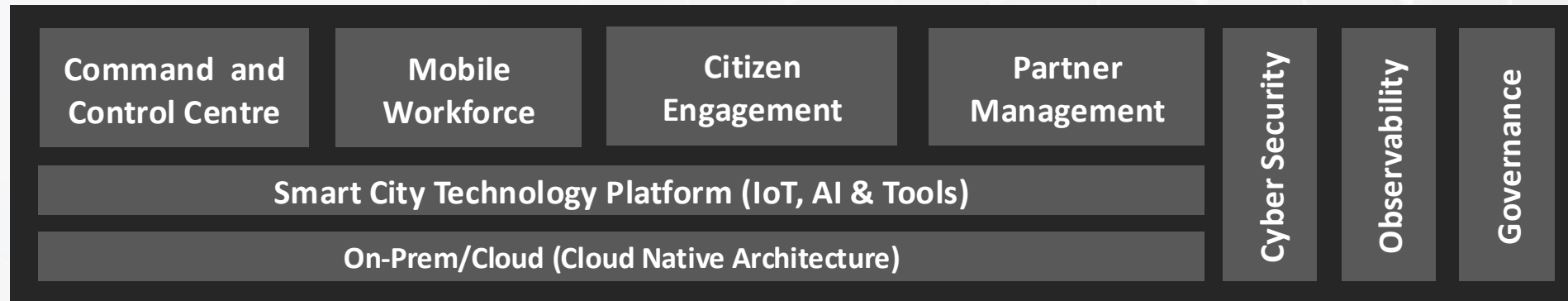
Improve Quality of Living	Emergency Response Video Surveillance & Analytics (CCTV)
Accessibility & Inclusivity	
Advance Sustainability	
AI Driven Intelligence	
Enhance Operational Efficiency	

Traffic Management
Smart Parking
Smart Transit

Smart Waste
Environment Monitoring
Smart Buildings
Sustainability Manager
Early Warning and Disaster Management

Smart Energy
Smart Water
Smart Lighting
Smart Power
Smart Irrigation

Foundation
Digital
Infrastructure
(Honeywell City Suite – HCS)



SMART CITIES DIGITAL PLATFORMS

Smart City Suite

Eco System Partners

Bundled Smart City Applications and Integrate Workforce to drive Employee Experience

Bundled Eco-system partner applications to drive community and partner experience

Bundled Citizen facing applications to drive citizen experience

Customers

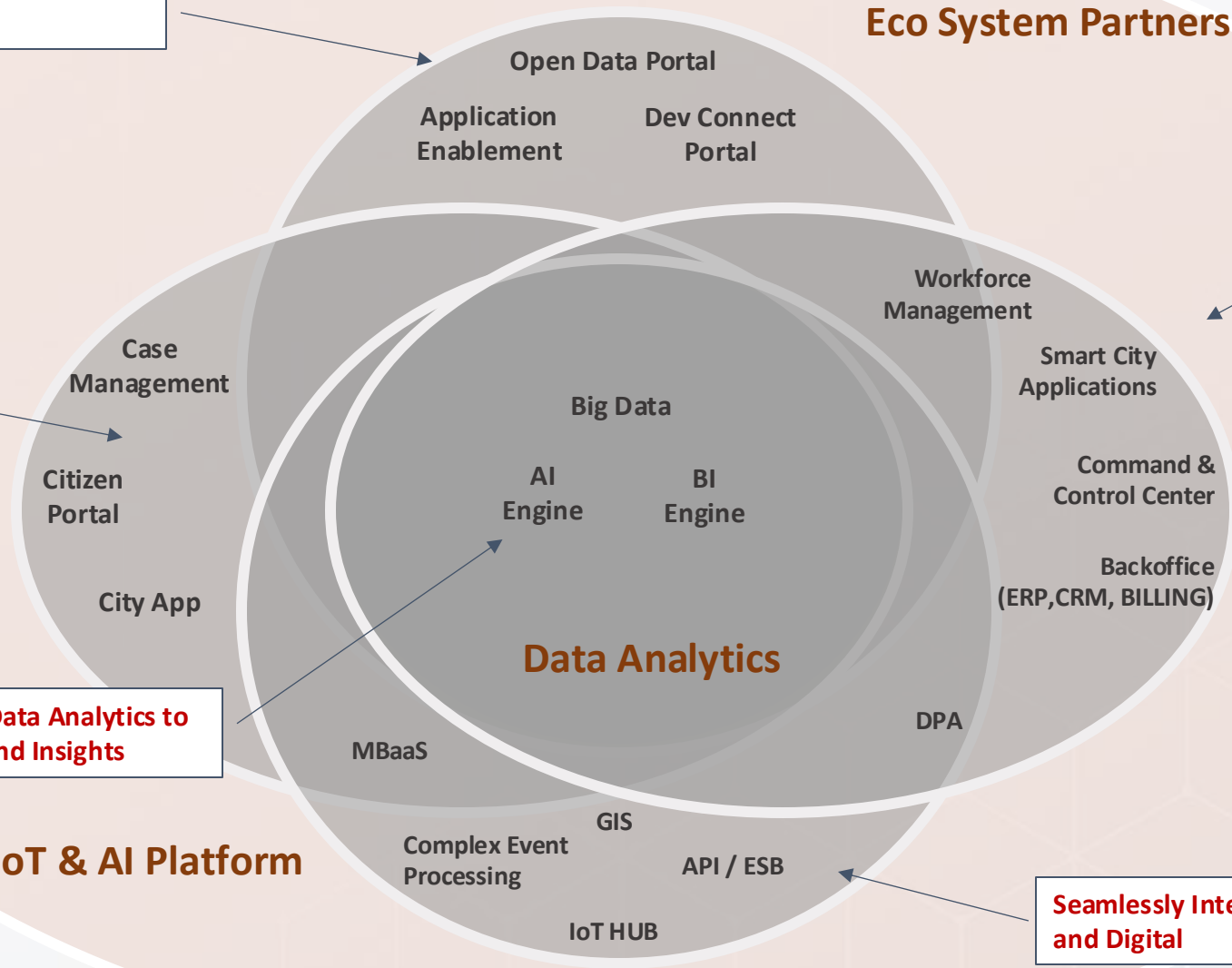
Employees

Pre-Integrated Data Analytics to Leverage Data and Insights

Seamlessly Interconnect Physical and Digital

IoT & AI Platform

Data Analytics



IOT DIGITAL PLATFORM



Data Integration

Seamlessly Integrate any Sensor and Application Systems using advanced technologies – IoT and APIs and deliver real-time visibility.



Data Processing

Complex Event Processing (CEP) engine to process the data in real time and create alarms, detect anomalies and digitalize workflows.



Data Management

Hadoop Big Data based Data Lake to store and manage structured, semi-structured and unstructured data.



Digital Process Automation

Inbuilt Engine to automate workflows and digitalize the business process



Location Intelligence

Pre-Integrated Location Intelligence engine for Geo-Spatial capabilities and integrate with any Map Services



Business Intelligence

Pre-Integrated Business Intelligence system with capabilities - Data Warehouse, ETL, Analytics and Visualization.



Cyber Security Management

Pre-Integrated Identity and Access Management system for Device, Application and User level security.



Low Code Tools

Out-of-the-box tools with domain templates for Data Integration, configure rules, dashboards and Digitalize Workflows.

AI PLATFORM



AI Engine

Pre-Integrated AI Environment for Machine Learning including Deep learning capabilities to deliver advanced analytics.



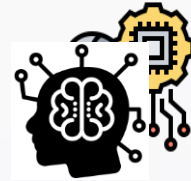
Machine Learning

Pre-Trained Models and Pipeline to solve Smart City domain specific problems and enable decision-making to deliver more intelligent and personalized services to users.



ML Composer

Low Code Tool based approach of ML environment to easily train, build and deploy machine learning models



Cognitive AI

Contextualize & deliver Real-Time inference dynamically based on the changing needs and behaviors of users and urban systems to deliver rich experience



Conversational AI

Natural Language Processing(NLP) Engine to deliver Virtual Assistance through ChatBoT, HumanBoT which can be embedded in Mobile Apps and Portal.



AI Apps

Pre-packaged AI apps leveraging the AI capabilities across Smart City Domains.

DELIVER DIGITAL EXPERIENCE TO EMPLOYEES

Integrated Command and Control Center

Unify the data from various system and create a common operating picture for Intelligent Operations.

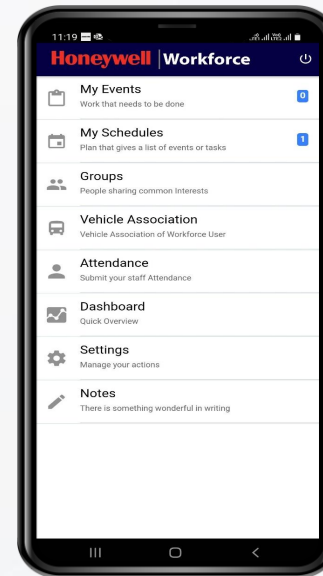


Incident Management

Manage the alarms and automate the SOP execution for various types of alarms

Dashboard and KPI

KPI Driven domain specific dashboard templates which can be personalised for every customer



Mobile First

Integrate the Digital Platform and back-end application systems through Mobile Backend as a Service and enable Mobile Apps based digital service.

Unify the Workforce

Unify workforce and Optimise efficiency through a Work Force Management System and enable real-time insights to carry-out field operations efficiently.

Workforce App

One Mobile App for all in-line departments user to provide real time insights to the incidents for taking actions faster.

INDUSTRY DOMAIN APPLICATIONS



ICCC- Command and Control Center

Build Intelligent Operations Center by Seamlessly Integrating various urban and community system, digitalize the processes and automate the operations to improve the safety and quality of living

Smart Infrastructure



ITS - Public Bus Transit System

Manage Fleet Schedules and Deploy Realtime Passenger Information system for Commuters

PARKING - Smart Parking Management System

Manage parking facilities , optimize revenue and provide Realtime parking services

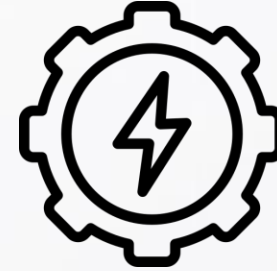
Traffic - Smart Traffic Monitoring System

AI Application for Traffic Flow Analysis

Mobility - Smart Mobility Transportation System

AI Application for Traffic Flow Analysis

Urban Mobility



Energy

LIGHTING – Street Light Management system

Manage and Optimize the Energy Consumption of Street Lights

SWM – Solid Waste Management

Manage Solid Waste Collection and Monitor Green House Gas Emissions.

SUSTAIN– Sustainability Manager

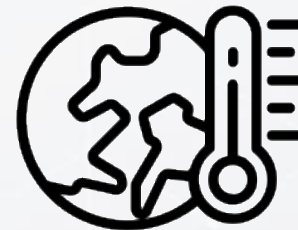
AI Application to Measure , Monitor and Report Sustainability for Energy Savings & CO2 Reduction

Water– Smart Water Management System

Analyze water consumption and detect any damage or leakages in real time.

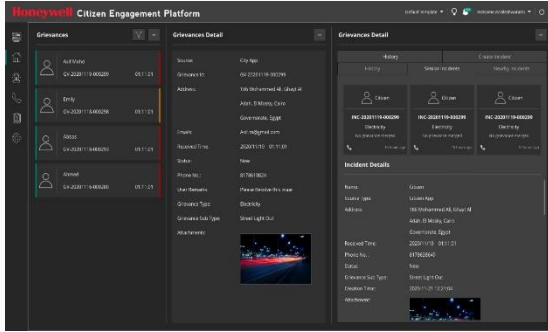
Irrigation– Smart Irrigation Management System

Monitor and control irrigation water delivery network to optimize water delivery to green spaces / areas to reduce over-watering and enable leak detection.

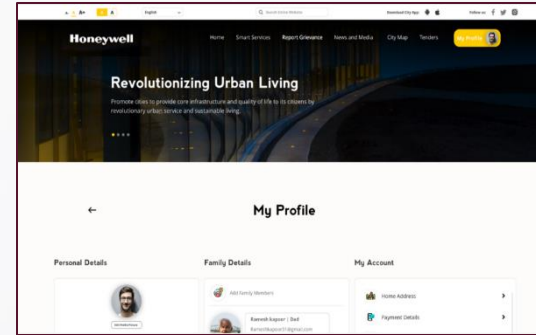


Smart Environment

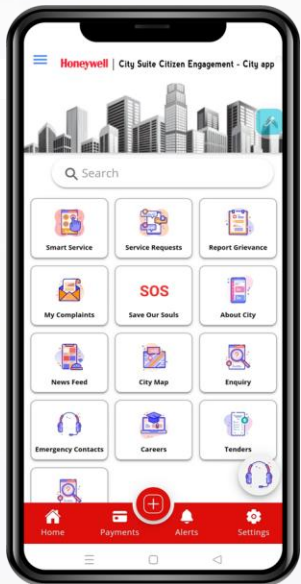
CITIZEN EXPERIENCE



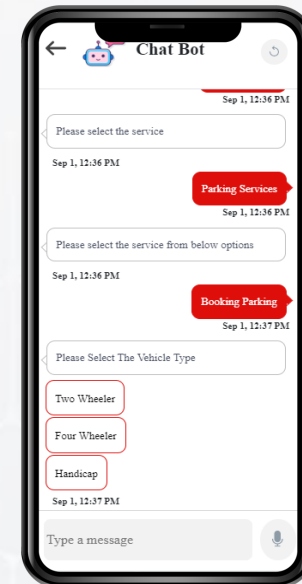
Case Management System
Omni-Channel case management system to field, manage and coordinate Citizen/ Residents/ Visitors grievances and deliver exemplary services.



Citizen Web Portal
Web-portal to provide online interface for Citizen/ Residents/ Visitors to digitally avail services, manage grievances and navigate urban spaces.



Citizen App
A super app that helps citizens/residents/visitors to navigate the urban space, avail civic and community services digitally.



ChatBot
Conversational AI Capability integrated with Mobile App/Portal

HumanBot
Personalize the experience through Digital Human Avatar

Digitalize services facing Citizens to avail civic services digitally and navigate the urban space efficiently

Honeywell Confidential - ©2024 by Honeywell International Inc. All rights reserved.

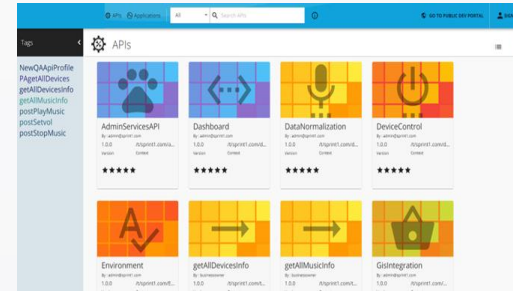


PARTNER EXPERIENCE



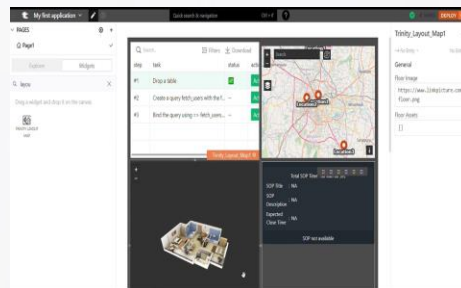
Open Data

Share the data with the Eco-system and community to consume the data and build third party solutions and improve the capability to deliver digital services



Partner Portal

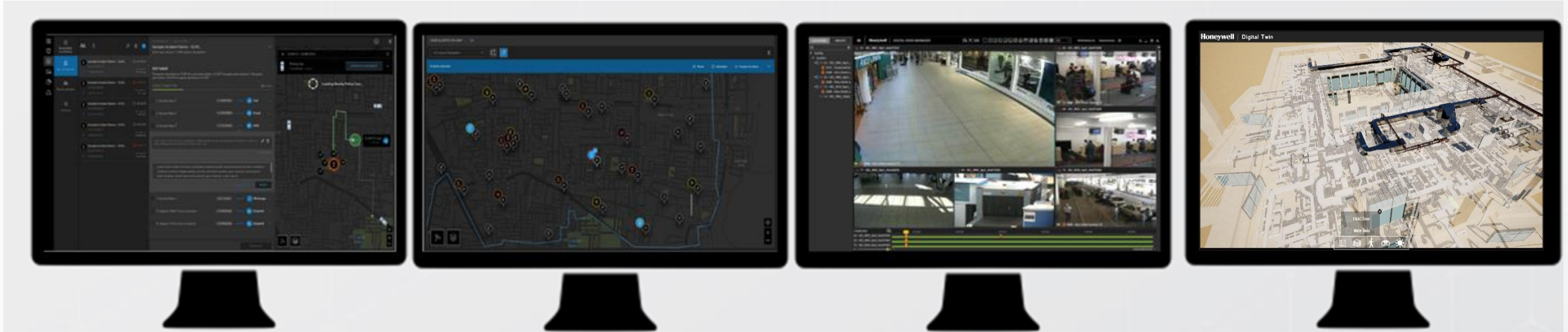
Enable a seamless experience for Partners to integrate their offering – devices/sensors and applications to build the digital infrastructure



Application Enablement Tool

Low Code Tool for Third party to build Applications leveraging the Digital Platform capabilities and enhance the capability of the offering

COMMAND CENTER OPERATIONS EXPERIENCE



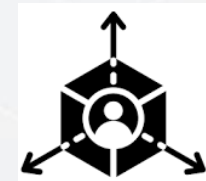
3 /4 Screen Operation

Easy and Quick situation Awareness



Alert & Event Management

Alarm Notification, Validation, Handover, Grouping & Event Management



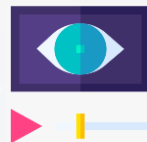
Digital Twin based Immersive Experience

Fully Integrated with Digital Twin for an immersive experience



GIS location intelligence

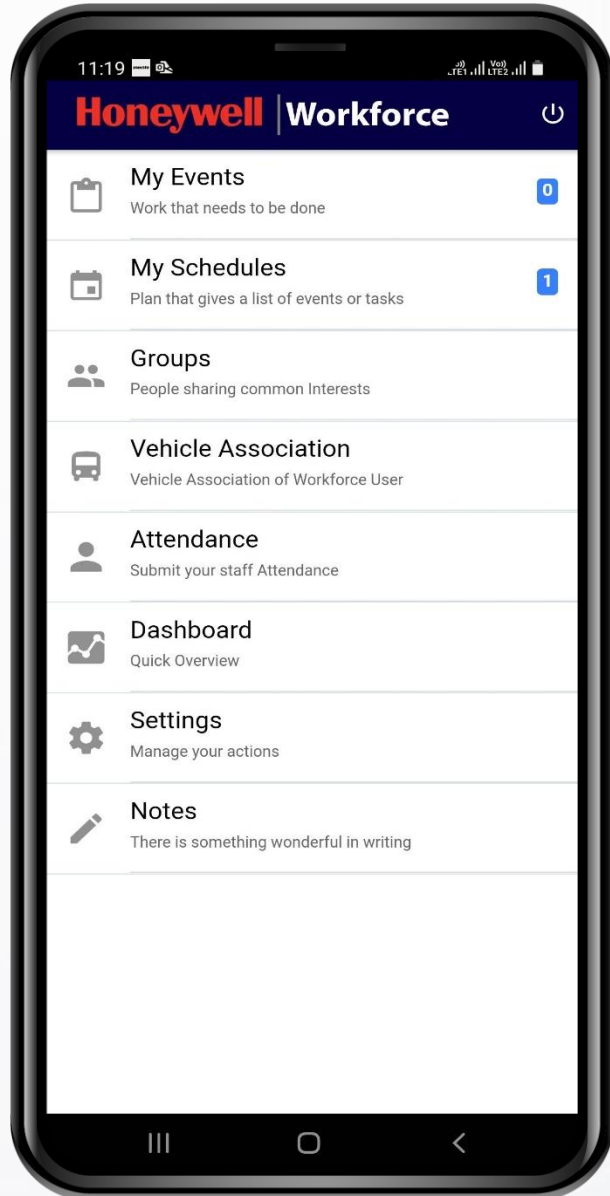
Fully Integrated with City Map, Points of Interest and Real Time Locations.



Video/Camera Visualization

Common operating picture on videowall for viewing during special events/emergency

EMPLOYEE EXPERIENCE - WORKFORCE



Mobile First

Integrate the Digital Platform and back-end application systems through Mobile Backend as a Service and enable Mobile Apps based digital service.

Unify the Workforce

Unify workforce and Optimise efficiency through a Work Force Management System and enable real-time insights to carry-out field operations efficiently.

Workforce App

One Mobile App for all in-line departments user to provide real time insights to the incidents for taking actions faster.

EMERSIVE EXPERIENCE THROUGH DIGITAL TWIN

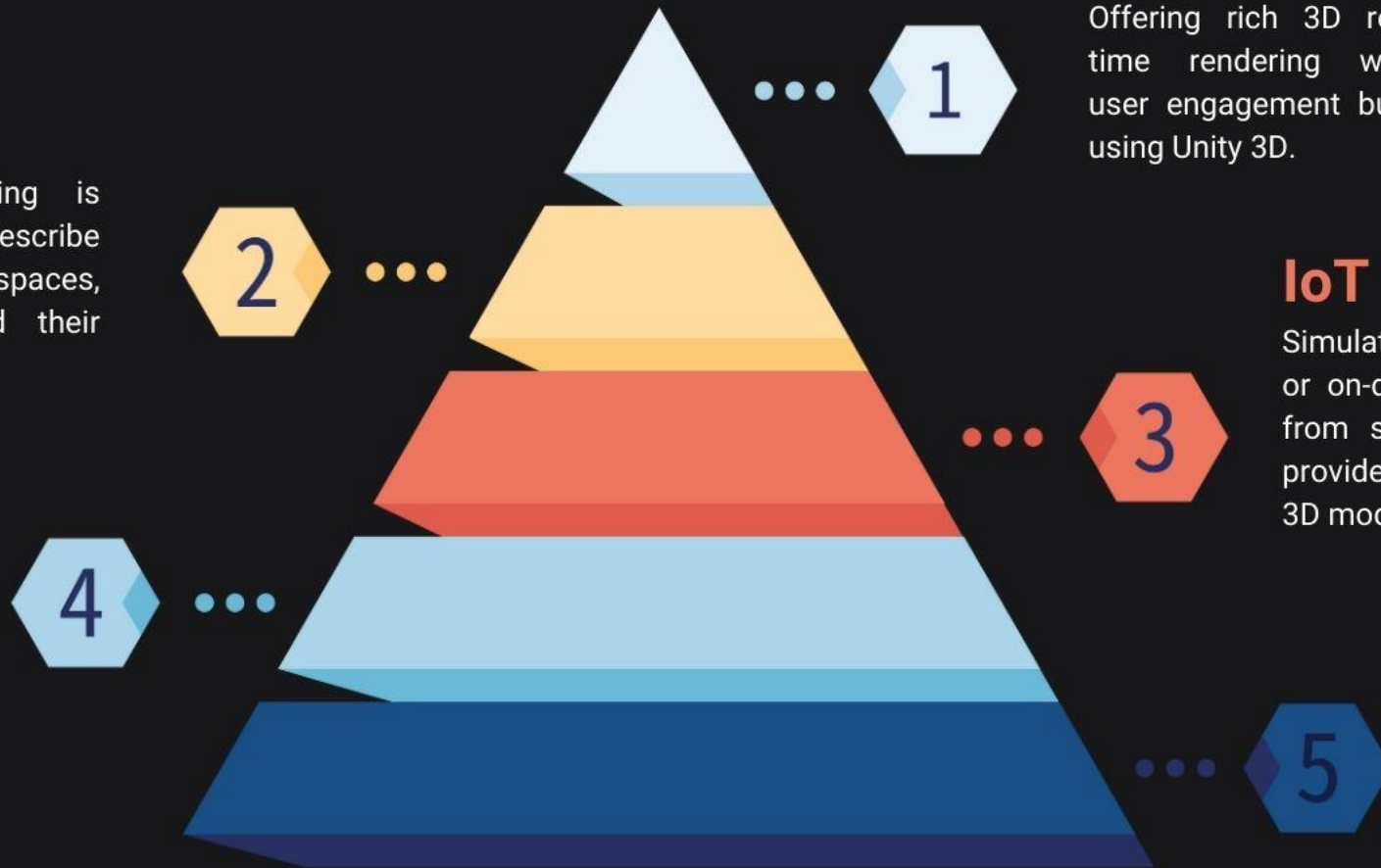
Digital Twin Layers

AI/ML

1.Data modelling is employed to describe the assets, spaces, processes, and their relationships.

BIM Data

1.Data modelling is employed to describe the assets, spaces, processes, and their relationships.



Visualization

Offering rich 3D real time rendering with user engagement built using Unity 3D.

IoT Data

Simulation of real time or on-demand IoT data from sensors/assets to provide context to the 3D model digital twin

3D GIS

3D GIS capabilities through the integrated GIS engine used for visualisation.

DIGITAL TWIN FUNCTIONS

Alerts and Operational Insights of buildings assets with powerful Dashboards & Analytics

- **Realtime Asset and sensor status**

Provide real-time readings of assets & sensors with asset location pointers with failure alerts.

- **Dashboard and analytics**

Provide complete analytics on the building operational and occupancy status.

- **Building navigation and exploration**

Navigate the building & 'teleport' to various parts of the building in a single click.

- **Monitoring general alerts**

Alert management via maintenance staffs with real-time information on alert status & location.

- The 3D IoT digital twin provides a **3D simulation** of building operations and performance.

- **Optimize, identify & predict** potential performance problems

- Manage alerts and assets from afar using **3D spatial contexts and lifelike 3D navigation** that gives the impression of being on-site.



THE ROLE OF AI IN SMART CITIES

THE ROLE OF AI IN SMART CITIES

OPEN DISCUSSION SESSION

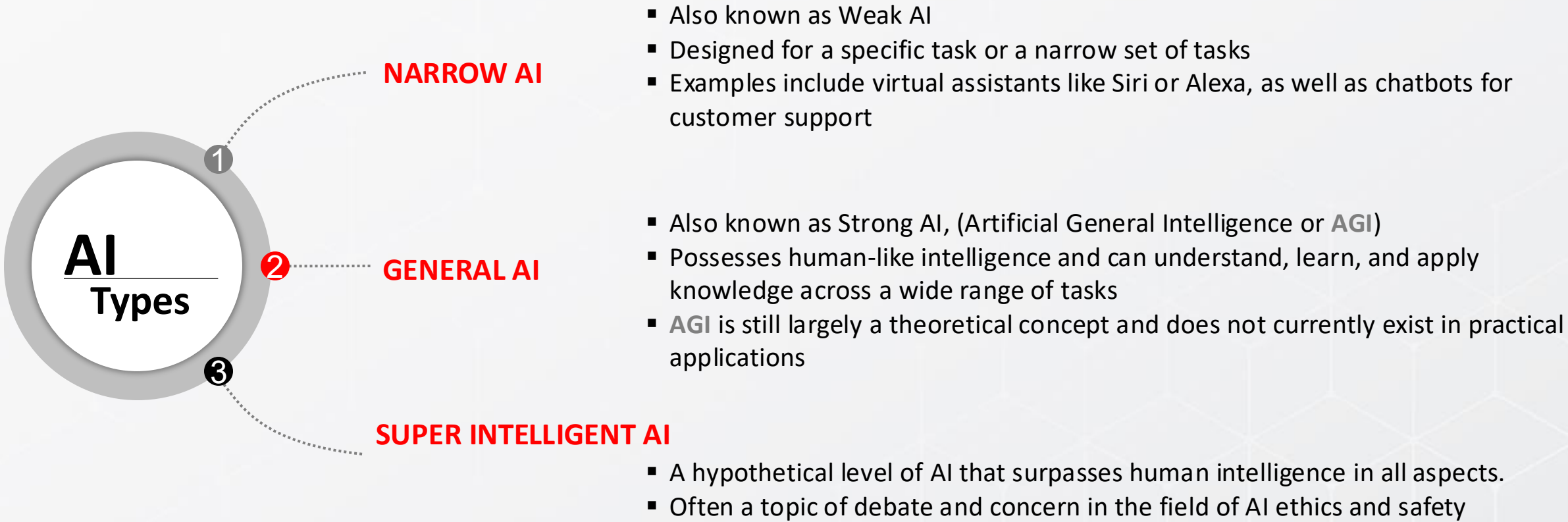
What is ML?

ML stands for Machine Learning, which is a subset of AI and focuses on training computer systems to learn from data and make predictions or decisions without being explicitly programmed.



What is AI?

AI stands for Artificial Intelligence, which refers to the development of computer systems that can perform tasks that would typically require human intelligence.



AI Types

NARROW AI

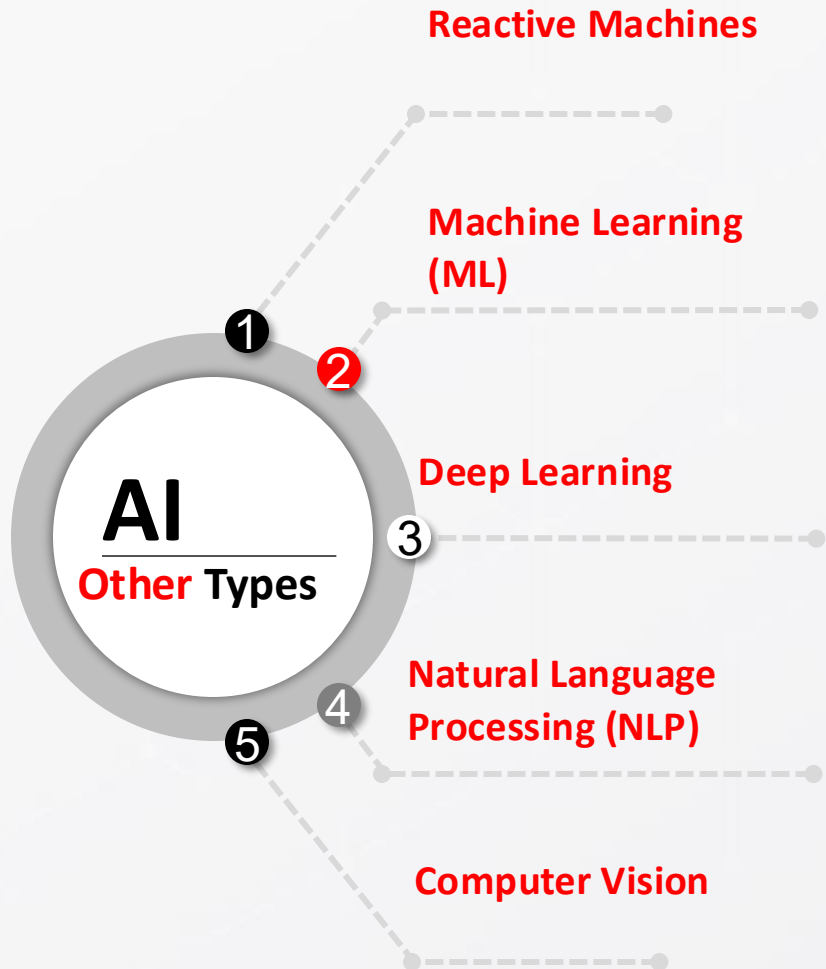
- Also known as Weak AI
- Designed for a specific task or a narrow set of tasks
- Examples include virtual assistants like Siri or Alexa, as well as chatbots for customer support

GENERAL AI

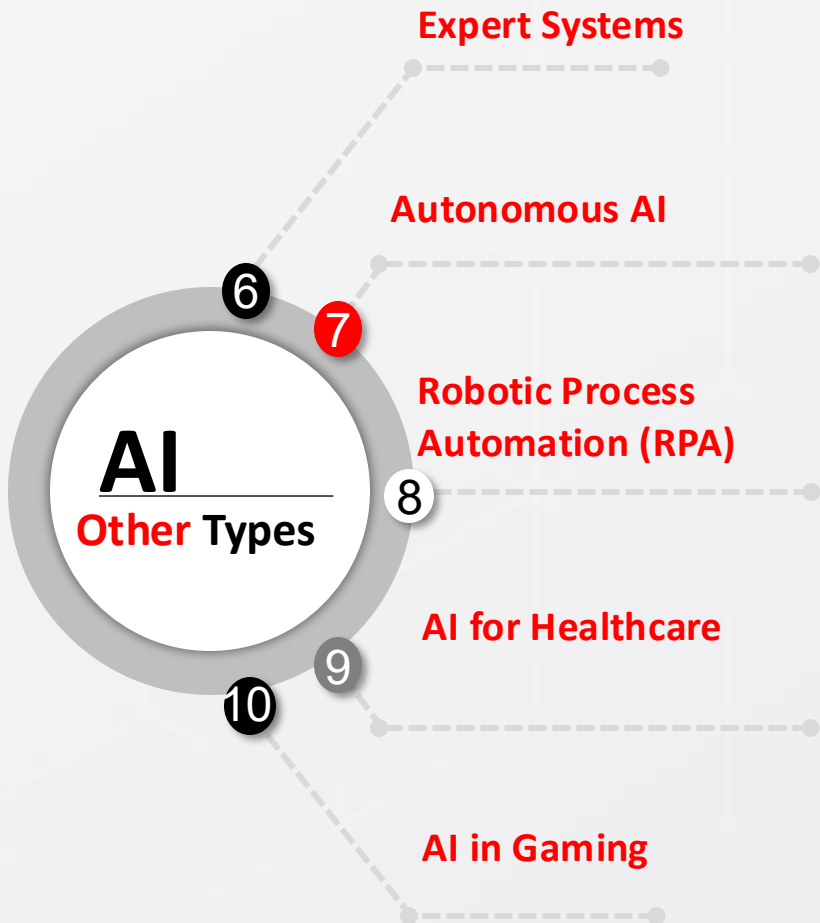
- Also known as Strong AI, (Artificial General Intelligence or **AGI**)
- Possesses human-like intelligence and can understand, learn, and apply knowledge across a wide range of tasks
- **AGI** is still largely a theoretical concept and does not currently exist in practical applications

SUPER INTELLIGENT AI

- A hypothetical level of AI that surpasses human intelligence in all aspects.
- Often a topic of debate and concern in the field of AI ethics and safety

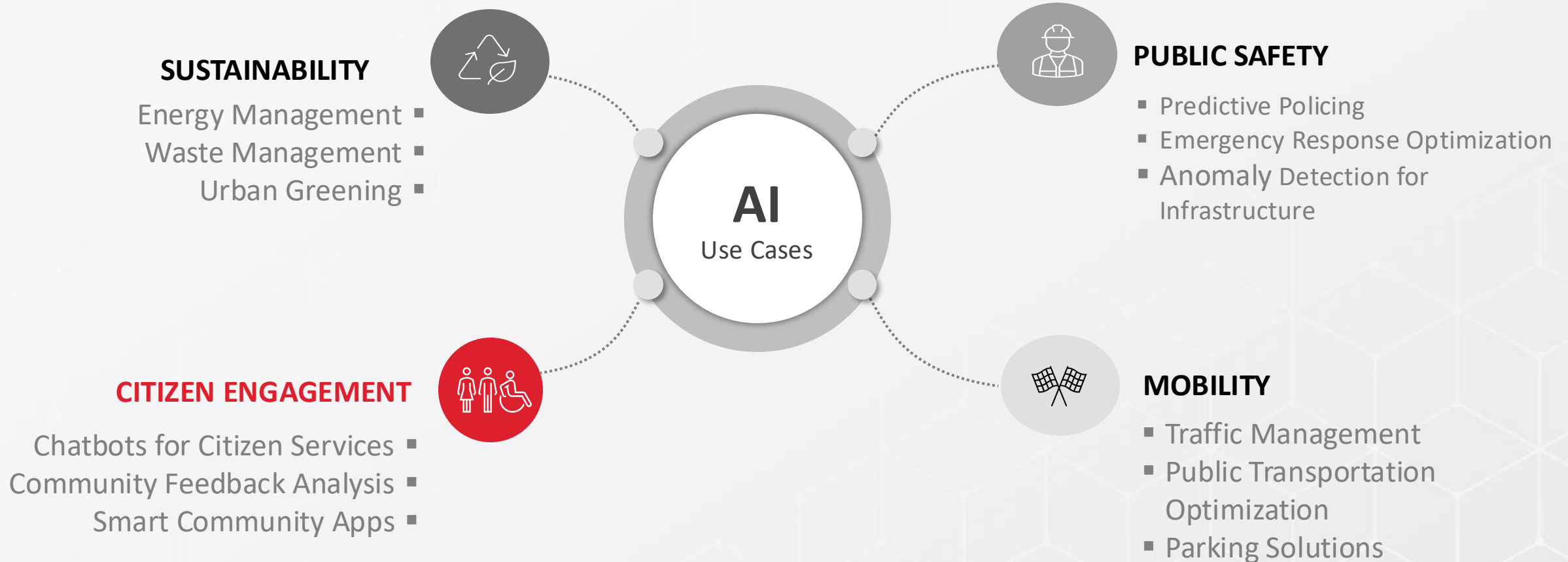


- These AI systems are designed to perform a specific task without learning or adapting over time. They operate based on pre-defined rules and do not have the ability to improve through experience
- ML is a subset of AI that focuses on the development of algorithms that can learn from data. It includes subtypes like:
 - 1 Supervised learning 2 Unsupervised learning 3 Reinforcement learning
- A specific type of machine learning that uses artificial neural networks to model and solve complex problems. Deep learning has been particularly successful in tasks like image and speech recognition
- AI systems designed to understand, interpret, and generate human language. NLP is crucial for applications like chatbots, language translation, and sentiment analysis
- AI that enables computers to interpret and understand visual information from the world. It's used in facial recognition, object detection, and autonomous vehicles



- AI systems that emulate the decision-making abilities of a human expert in a particular domain. They use a knowledge-base and inference engine to make recommendations or solve problems
 - AI systems that can operate independently and make decisions without human intervention. These are used in autonomous vehicles, drones, and industrial automation
 - AI designed to automate routine, rule-based tasks in business processes. RPA can increase efficiency by performing tasks such as data entry and data extraction
 - Specialized AI applications in the healthcare industry, including medical diagnosis, drug discovery, and health monitoring
- AI systems that play video games autonomously, like DeepMind's AlphaGo and AI opponents in video games

SMART CITY MAIN PILLARS



CASE STUDY

Greenfield Smart City in META Region

- New administrative and financial capital
- Home for 8Mn population
- Area will expand over 700Km2

Digital Transformation of city and delivering digital experience to Citizen and Employee by integrating core process of Metering, Electric Distribution, Parking, Street Lightings and Buildings

HCS 's Single Suite Software

City Operation Centre

Mobile workforce Management

Citizen Engagement

AI & BI Applications

Smart Grid with OMS

Meter Data Management

IOT & AI PLATFORM

Scale of operations



25000+



5000+



700000+



700000+



700000+



100000+

Solution highlights



City Operations Centre to Connect & Monitor



Integration to multiple in line Department Services – Gas, Water & Electricity to increase availability and manage operations



Automate Parking Slot Assignment & Street Light Scheduling



Using advanced analytics & AI for leakage management, outage management & grid reliability



Workforce App to Integrate Department Workforce and provide them Insight



Citizen Engagement to transform civic service delivery



THANK YOU

HONEYWELL GLOBAL SMART CITIES TEAM