Problem Statement/Title: Data-driven Environmental Services Operations

Desired Outcomes:

A user-friendly, internet of things (IoT) driven platform with the use of IoT devices, sensors, self-cleaning solutions and robotics that allows for integration, monitoring, data analytics for activation of resources and tracking of performance so as to promote on-demand deployment and automation to manage daily routines for a cluster of buildings which includes Malls and Offices.

Such platform shall enable real-time situational awareness and proactive management of the environmental services (ES) performed on the property.

From this project, Mapletree aims to achieve the following outcomes:

1) Optimise resource deployment and workflow redesign for better cost and productivity efficiency and resulting in lower operating costs
2) Business analytics capability to aid in activities such as tender budgeting and contract administration
3) Improve customers' and tenants' satisfaction by improving cleaning standards and reducing time taken to address issues
4) Scalable system to allow for integration of other building systems for M&E, security systems, IoT devices, sensors etc and provide meaningful analytical trending reports

Background of Problem:

Mapletree currently deploys the use of a Facilities Management System (FMS) for fault reporting, scheduling of routine inspections and preventive maintenance. The company has also deployed various cleaning robots, waste bin sensor and smart rodent traps by the appointed cleaning and pest control service providers.

More innovative technologies are desired to address persistent issues such as pest issues, faulty toilet fittings, overfilled general waste bins, toilet chokes, empty soap dispensers, dirty toilet seats, wet floor and vanity tops which cleaning service providers are taking the following approaches, and could be further improved:-

i. a reactive approach to resolve the issues only when the cleaners become aware of it during their day to day maintenance operations or through tenants'/shoppers' feedback;
ii. Through stipulated frequency of inspections, which could be reduced, resulting in effective deployment of resources with assistance of technologies.

Project Requirements:

1. Reduce operating costs with attractive investment payback for adopting systems integration and process automations
2. Improve productivity of ES services using technologies for on-demand deployment and reducing number of routine tasks
3. Allow for data analytics to improve manpower deployment and fine tune future contract requirements for better cost efficiency
4. Enhance productivity and service delivery standard to our tenants and shoppers, without incurring additional manpower
5. Analyse trend of defects, locations of defects so as to implement effective preventive maintenance
6. Identify the root cause of defects without deployment of technical team to carry out troubleshooting

Timeframe for development of proposed solution/product

12-15 months

Requirements of prototype

1. At least 50% reduction in customer feedback on ES-related issues (e.g. overfilled bins, smell-related issues, water spillage, lack of toiletries, non-functioning devices etc). Issues to be identified and rectified before customer feedback.
2. Allow for detection of issues and auto triggering/deployment of resources/robotics for rectification works.
3. Able to differentiate the types of issues to prioritise and identify different priorities of faults for the nearest cleaners, technicians and robotics to respond to it.
4. Integration with existing FMS and robotic solutions for fault reporting and deployment where possible.
5. 99% availability of analytical reports.
6. To allow prompt detection and collation of defects to be disseminated to relevant officers to rectify efficiently.
7. Customisable reports and dashboards which support multiple chart types.
8. Include IoT technologies for rat detection and elimination.
9. Ability to compute the cost reduction and productivity enhancement before and after implementation.

Business model for proposed solution/product

To propose business model to be adopted by service providers and service adopters for the implementation of the solution.