



Customer Success Story

Building an IoT enabled Integrated Workplace Management System (IWMS)



Customer: A Leading Facility Management Company

Country: India

Industry: Facility Management

Our Role: Product Engineering

About the Client

The client is one of the renowned names for providing hyper automated B2B digital solutions for business support services (facility management & support services). They offer a range of workplace and hospital management solutions that can either work in standalone mode or as an integrated enterprise platform.



“We have a giant ambition to be in a position of preeminence in creating and transforming the facilities management industry digitally. We are committed to being innovative, disruptive, and impactful in our solution, now and in the future. Daffodil as our technology partner is ensuring this to the fullest extent.”

The Situation

An urge to create better workplaces

The COVID-19 pandemic has put the modern workplace in turmoil. As organizations are taking steps to adjust to the “new normal”, they also need to set the stage to succeed in the transformed post-pandemic workplace. Few forward-thinking organizations are already in the race to build safe and efficient workplaces by leveraging tech to collect user data, integrate IoT sensors, and automate workflows.

On similar lines, our client envisioned empowering the administrators of facility management services with new-age digital solutions. These solutions would enable facility managers to have insights on how the resources are utilized, ensure regulations & compliance, check for measures to improve efficiency, maintain cost-effectiveness of facilities, etc. through IoT-enabled sensors. They needed a team that could help them with strategy, technology, cost optimization, architecture, time-to-market, and other related aspects of development.

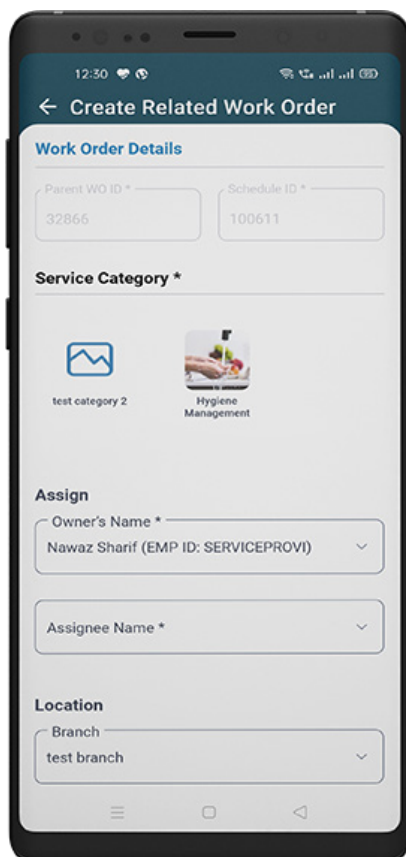
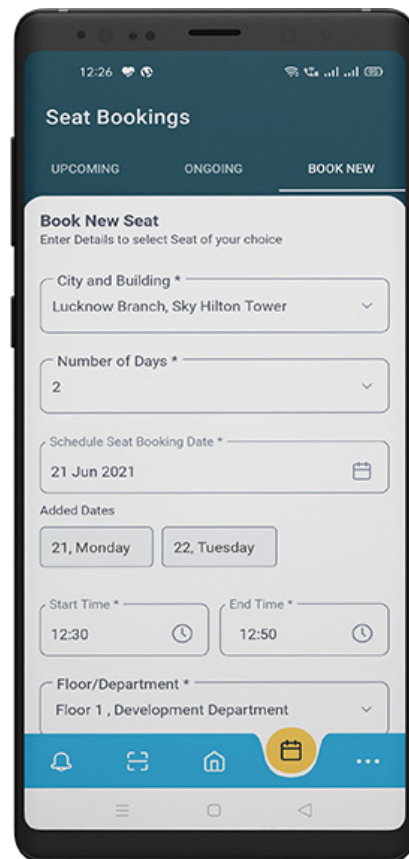
This solution would have several modules such as meeting room & seat management, asset management, hygiene monitoring & management, pantry management, etc. Here are a few key requirements of the client.

- The meeting room management system should digitally orchestrate meeting room reservations, anytime and from anywhere. There are multiple challenges involved in reserving a meeting or a conference room. People usually reserve multiple rooms for the same meeting, they forget to cancel the reserved rooms if the meeting does not happen, rooms are occupied without booking, uncoordinated meeting scheduling, etc. are some of the common issues associated with a meeting room reservation.
- Apart from this, maintaining social distancing and hygiene at the workplace was a challenge for the facility management team. Studies have shown that 16% of flu transmission takes place at the workplace which proves to be problematic during the COVID-19 pandemic. Thus, a seat management system was required that would help in systematic seat allocation and hygiene monitoring to maintain a safe work environment within the organization.

The Solution

Team Daffodil, on analyzing the app requirements, proposed a development roadmap to the client which included user stories, technical specifications, and recommendations to give an edge to their app idea. Team Daffodil developed a meeting room management system that facilitates everyone in the organization to orchestrate meeting room reservations. The application allows users to check the meeting room status (occupied or vacant), notify attendees and other stakeholders (services) about the reservation, reschedule or change meeting room, extend, cancel, or revoke the meeting room, etc.

The seat management system allows employees to book a seat for themselves. The system validates the employee health using the Arogya Setu app (in India) and allows them to choose a seat at the preferred location, cancel/update booking requests, mark the seat as occupied or vacant, share feedback for the services, etc.



The hygiene monitoring and management system creates a plan/schedule for hygiene as per the organization. The supervisor uses handheld devices to measure factors such as ATP meter and other handheld devices to take the air quality measurements. The application fetches the ATP and AQR readings through APIs from the third-party handheld devices placed in the meeting rooms.

To manage meeting room/employee seat reservations, hygiene, and related activities, Android and iOS mobile apps were developed with different staff roles (employee, guest, security/reception, pantry services, janitorial services, etc.). Along with this, a web portal was developed that allows the admin to manage the staff roles, services, seats, and other facilities within the organization.

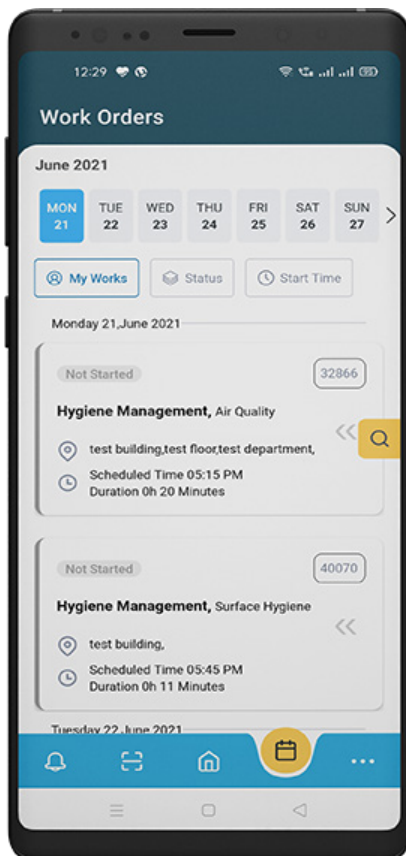
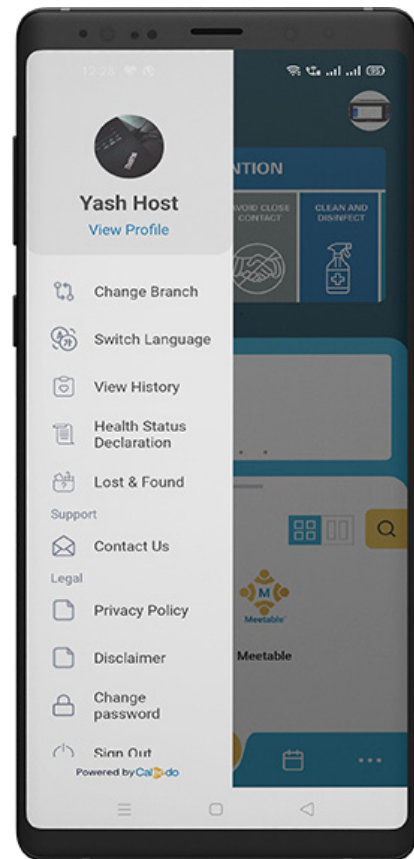
For meeting room management, the admin can check for info like room utilization, utilization by location, utilization by the person (most used by), canceled bookings catering reports, future bookings, no-show reports, booking history, etc.

In the admin portal for seat management, the admin gets the report having information about seat utilization (occupied or vacant seats). Seat utilization (temporary or permanent), upcoming bookings, no-show reports, etc.

For hygiene management, the admin can check hygiene measurement plans and get info on non-compliance with hygiene measures with date filters.

Implementation Highlights:

- Daffodil created a cloud architecture using Google Cloud Platform services. Since the application had a large scope of work with numerous services, the microservices architecture was adopted. This ensured that the services are scaled, whenever required (without affecting the functionality of the entire app). Moreover, to ensure that database queries don't have a load, an individual database was assigned to each service.



- For fault-tolerance and scalability, containerized applications were developed. This was done to ensure that load on one service does not require the entire application to scale up. Containerization also helps in optimizing the overall cost of the application.
- The APIs used in the application are secured with the hashed encrypted token. Any request to the server is encrypted using the Spring Auth tool.
- The databases are kept in a private subnet. Since microservices would be connecting with external networks, they will pass through the GCP gateway. This will ensure that the IP is not publicly visible to the intruders. The microservices are connected with the internet but their original source is hidden.
- For disaster recovery, timely backup cluster resources are taken. This backup also helps in the migration of cloud data, restoring migration data to the production environment, etc.

The Impact

Team Daffodil has successfully delivered the three modules of the facility management system. These modules have been tested and proven support to manage seats and meeting rooms at the workplace in the UAT phase. Currently, the client is able to offer standalone workplace applications like hygiene management, seat & meeting room management which address the challenges at workplaces due to the COVID-19 crisis. The team at Daffodil is working on the rest of the modules of the solution such as asset management, cafeteria services management, pantry management, etc.



Technology Stack



- Java 11
- React Native
- Angular 9
- PostgreSQL
- Kubernetes
- SonarQube

About Daffodil

For more than 20 years, Daffodil Software has been a trusted software technology partner to organizations across the globe. We take pride in our ability to look beyond technologies & deliver innovative solutions.

Daffodil is a CMMI level 3 accredited organization with innovation, tech agility & process orientation rooted deep within the core. Our team of 1000+ technologists strive to shape the tech industry and help businesses elevate their value proposition through technology.

Awards & Accolades

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