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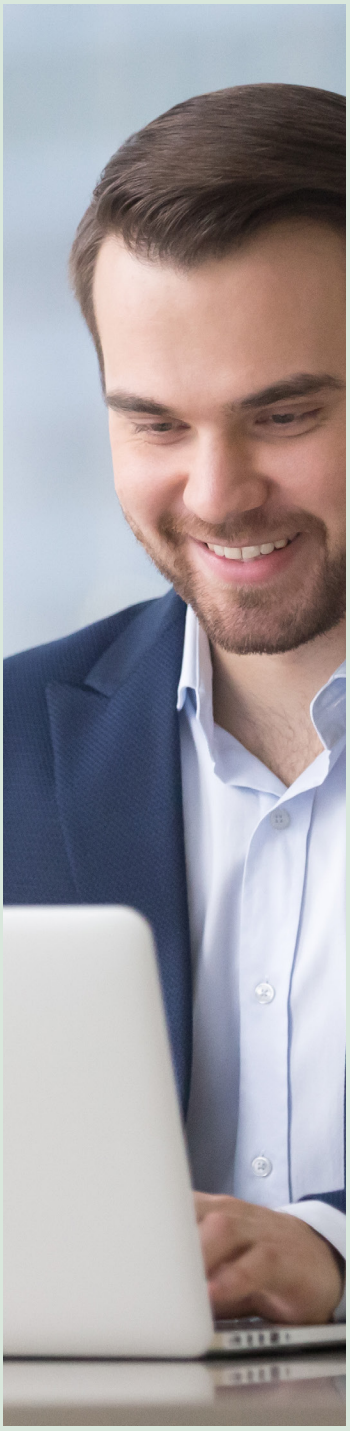

DRIVING INTELLIGENT SCHEDULING WITH ORACLE FIELD SERVICE CLOUD

Abstract

After-sales service plays a crucial role in shaping brand perception and driving customer retention. Focused, personalized service elevates customer satisfaction, secures repeat business, and fosters long-term brand loyalty. Conversely, poorly executed service can damage brand reputation, increase customer churn, and consequently erode company revenues. Therefore, it is imperative that businesses invest in robust, cost-effective solutions that deliver exceptional customer experiences.

This paper discusses the Infosys solution for field service transformation, focusing on engineer scheduling and resource optimization powered by artificial intelligence (AI). It highlights key design considerations for achieving first-time-right (FTR) task assignments, minimizing manual intervention and truck rolls, and maximizing daily throughput.

The solution integrates Oracle Fusion Service for managing service requests (SRs), work orders, and service-level agreements (SLAs), with Oracle Field Service Cloud (OFSC) for intelligent, AI-driven routing and scheduling.

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Optimizing Field Service Scheduling: An Introduction

Effective scheduling is critical for service organizations to efficiently manage their field engineers. Inadequately planned schedules can lead to inefficient task allocation, excessive idle time, and reduced productivity. Inefficient route planning can cause unnecessary travel or delays in reaching customer sites. Moreover, engineers may arrive at customer sites unprepared, without the necessary spare parts, tools, or the appropriate skill set for the job.

These challenges often require repeated visits or manual interventions, resulting in lower productivity and customer dissatisfaction, ultimately impacting the organization's revenue and brand reputation.

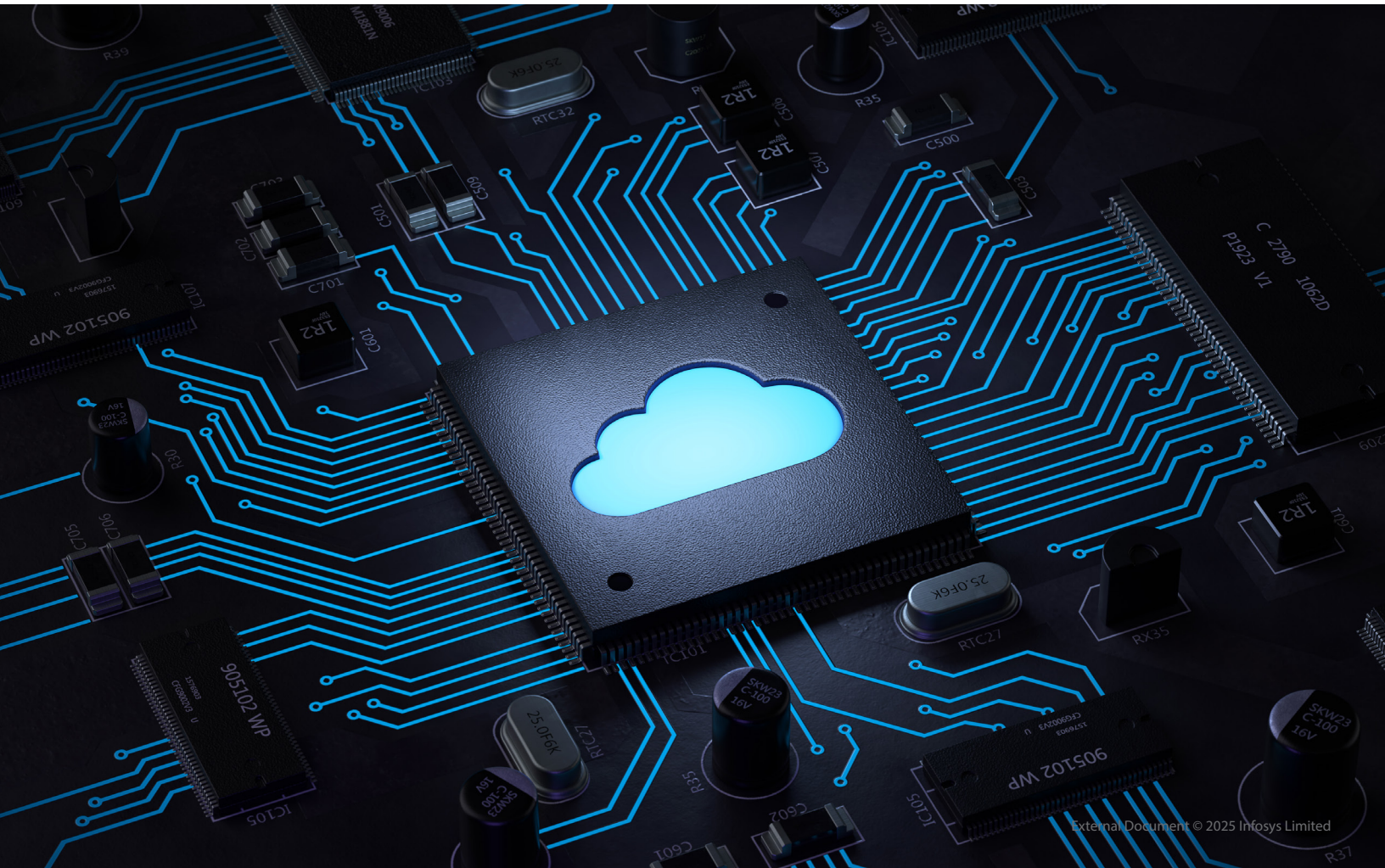
To ensure service excellence, a field engineer assigned to a customer service task should:

- Be technically qualified and equipped with the relevant job-related information
- Carry the required tools and equipment
- Arrive at the customer site on time
- Be assigned an optimal number of tasks in sequence, allowing for real-time, last-minute changes in the schedule

Oracle Field Service Cloud (OFSC) offers advanced configuration capabilities and powerful routing algorithms that automate job scheduling and assignments based on multiple complex parameters. The algorithm continuously learns from past assignments to improve scheduling accuracy while enabling manual adjustments when needed.

The following sections discuss the key factors involved in configuring the solution.

In this paper, the term *field engineer* refers to the individual providing customer service. Depending on the industry, field engineers may also be known as *service engineers, technicians,* or *crew members.*



Field Service Efficiency: Key Considerations and Challenges

Implementing a structured field service solution requires thorough groundwork to achieve the desired outcome. Essential aspects to consider include:

1. Planning and logical task grouping:

Various tasks assigned to field engineers should be suitably grouped to support efficient scheduling. Table 1 describes a typical classification of field engineer tasks.

Table 1: Classification of service activities

Activity Categories	Description
Preventive maintenance	This includes regular audits, periodic inspections of customer equipment, spare part replacements, consumable refills, and general equipment upkeep. These proactive maintenance activities detect issues, prevent breakdowns, extend asset life, improve uptime, and reduce operational costs[1].
General and break-fix repairs	Despite regular maintenance, equipment may still require unforeseen break-fix repairs. While some repairs can be deferred, critical issues need immediate attention and prioritization. These tasks are governed by predefined service-level agreements (SLAs) and are based on the contract terms and entitlements associated with the asset.
Infrastructure maintenance and repair	These activities involve regular inspections and maintenance of large-scale infrastructure such as bridges and roads. Periodic monitoring ensures timely intervention to handle wear and tear as well as prevent major failures.
Project-based activities	Field engineers could be deployed in project-based environments, such as large equipment installations. These projects often require diverse skills and coordination among multiple resources, which may span several days.
Administrative activities	Field engineers may sometimes need to carry out non-customer-facing activities that include administrative tasks. For example, warehouse visits for stock replenishment, periodic inventory audits, vehicle maintenance, mandatory training sessions, or internal team meetings.
Meter reading	Primarily utility tasks, these are focused on capturing the latest equipment meter readings to generate accurate, usage-based customer billing.

Activity categories may include additional dimensions, such as:

Linked follow-up tasks

After a key installation, the field engineer may need to revisit the customer site within a few hours to monitor system and operational performance.

Unplanned follow-ups

Certain issues may require unexpected follow-up inspections or additional overhaul.

Multi-day activities

Some tasks may take several days to complete, while others may extend to the following day due to their complexity or unforeseen delays.

2. Factoring in service hours:

Support services may operate varying hours, such as 16x5, 24x5, or 24x7, depending on industry requirements, with customers across different time zones and geographies. These factors must be considered when designing the solution to ensure accurate scheduling and monitoring.

3. Rescheduling tasks:

Customers may request to reschedule previously confirmed appointments. The system must be able to dynamically reassign engineers and recalculate their field routes in real time.

4. Scheduling related activities:

Similar or related activities at the same site should be scheduled together where possible. For example, a utility company may require an emergency repair around the same time a meter reading is scheduled. In such a scenario, it is efficient to plan and execute both tasks in a single visit.

Each organization or industry has its unique requirements, which must be considered when designing a comprehensive field service solution.

Regulatory and Compliance Requirements

Regulatory and compliance requirements can significantly influence field service implementations.

Local governing bodies may enforce specific rules around after-hours or weekend work, including compensation policies and working conditions. Additionally, they may mandate workforce diversity within service teams. Service organizations may have to capture and periodically report customer data to local public utility departments.

Data privacy laws, such as the EU's General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) in the US, must be strictly followed in their respective jurisdictions.

To enforce compliance, robust authorization mechanisms should be implemented to restrict access to sensitive data. Data masking may be necessary to protect personal identification information (PII) of both field engineers and end customers. Furthermore, at the end of the asset lifecycle or upon termination of customer relationship, any associated data should be securely purged in accordance with local data laws.

Compliance requirements can also vary by industry. For instance, in the utilities sector, including gas, water, and electricity, organizations are subject to strict data protection regulations. High-risk service industries involving fire safety or high-voltage electrical systems should adhere to stringent safety norms and strictly follow protection checklists on customer premises.

Case Study 1

According to California state labor law, employees must receive an unpaid 30-minute meal break after every five hours of work. If the lunch break is delayed, the employer is obliged to compensate the employee with an additional hour of pay at the regular hourly rate. The lunch break can be waived only if the workday does not exceed six hours.

One of Infosys' clients, a high-tech manufacturing company, addressed this by configuring lunch breaks as an administrative activity. It was set up as a mandatory task scheduled within a flexible time window around noon.

The Infosys Solution

Infosys has developed a comprehensive industry solution that empowers asset-heavy organizations to successfully achieve field service transformation. This connected, turnkey solution gathers tasks and work orders from multiple sources and efficiently routes them to appropriate field engineers with minimal manual intervention.

Built within Oracle Cloud's robust ecosystem, the solution leverages Oracle Fusion Service and Oracle Field Service Cloud (OFSC), seamlessly integrated through Oracle Integration Cloud (OIC). Figure 1 illustrates the integration architecture.

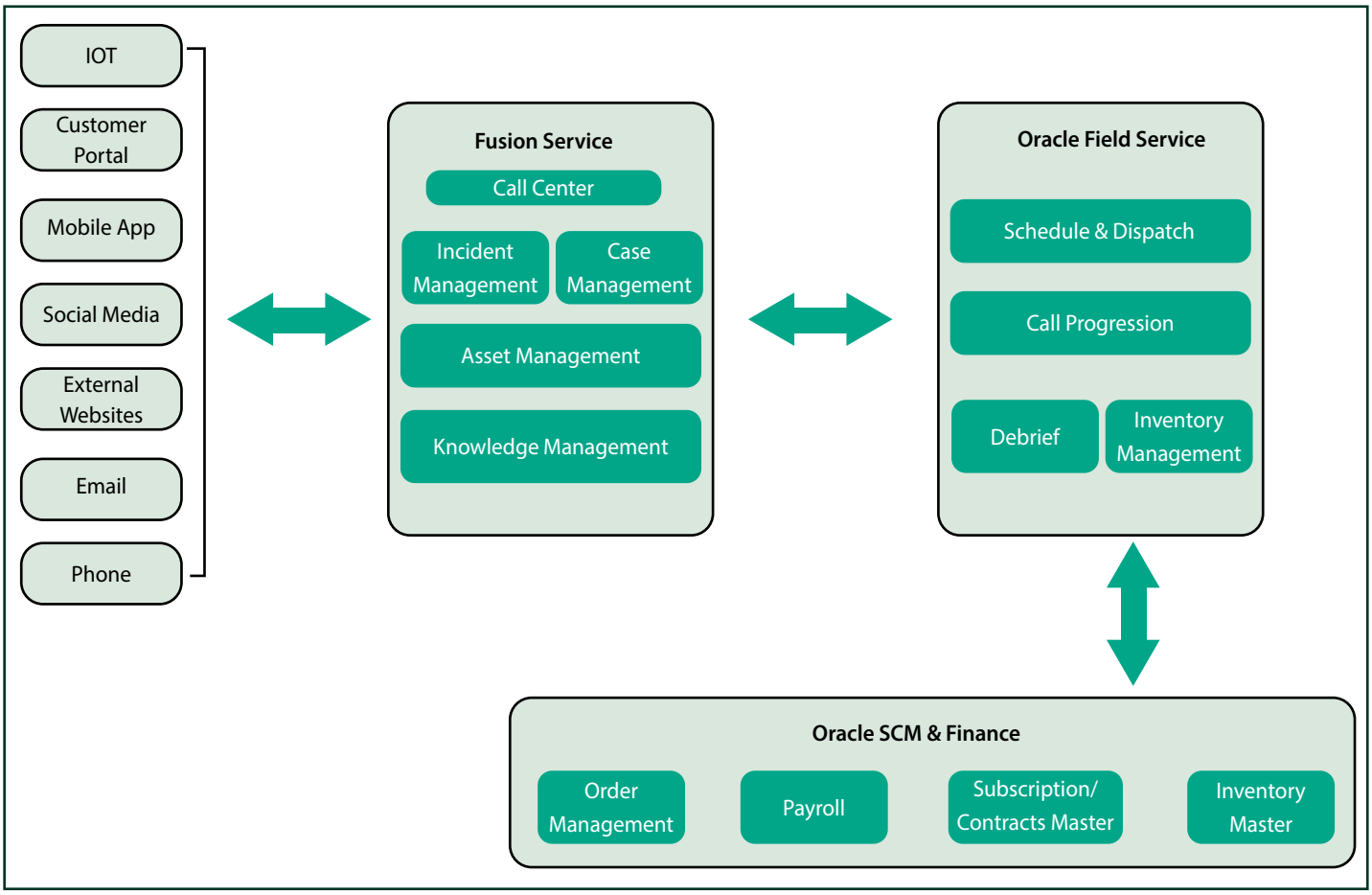


Fig 1: Infosys' field service integrated solution using Oracle Fusion Service and OFSC

Service requests may originate through several channels, such as phone, email, and customer self-service portals. They may also be automatically generated by assets through self-monitoring technologies and the Internet of Things (IoT).

As highlighted in an Infosys white paper on the evolving B2B customer experience paradigm, the rise of digitalization, interconnected systems, and scalable automation is reshaping how systems can self-analyze, self-heal, and flag issues that require human oversight[1].

Oracle Fusion Service serves as the central unit for managing service requests (SRs), equipment records, asset data, entitlements, and service contracts. Service requests from multiple sources are integrated into Oracle Fusion Service, which automatically generates the necessary service tasks.

Based on the associated contracts and entitlements maintained in systems such as Oracle Subscription Management Cloud or Oracle E-Business Suite (EBS) Service Contracts, the system determines applicable SLAs. Tasks or work orders requiring field visits are then transferred to OFSC, where the scheduling engine assigns them to the appropriate field engineer.

Case Study 2

Infosys implemented a fully automated field service solution for a leading fintech company, enabling customer assets to initiate self-service requests and automatically generate service tickets via IoT. The entire ticket lifecycle, from creation to repair, is completely automated, requiring minimal manual intervention.

Designing the Schedule and Dispatch

A typical field service team may comprise diverse personnel, including in-house engineers, on-call support staff, temporary contingent engineers, vendors, and contractors. For efficient operations, each role in the system must be clearly defined and transparent, with visibility across the system, and appropriate access controls based on responsibilities.

In addition, the following critical components must be incorporated in the solution:

Territory Management

This involves defining the geographical and regional boundaries for field service operations, including customer asset locations and potential new installation sites. These areas should be logically divided into smaller, manageable territories, with one or more field engineers assigned to each.

Competency Management

A centralized skills repository must be created and maintained for managing field engineer competencies. These skills should be captured at a granular level, ensuring complex jobs are broken down into smaller, manageable tasks that can be matched and assigned to relevant team members.

Availability Management

Master data containing supported work hours, weekend shifts, engineer schedules, and holiday calendars must be accurately defined and regularly updated.

Resource Configuration

Field engineers must be configured as users or resources in the system and assigned specific:

- Roles, defining access and responsibilities
- Territories, depending on the geographic regions they serve
- Work competencies corresponding to their skills
- Work schedules reflecting their working hours and availability

The system should also enable field engineers to update their availability based on their planned and unplanned leaves.

Smart Task Assignment Dashboard

In Oracle Field Service Cloud, tasks can be automatically assigned to field engineers through Oracle's out-of-the-box routing module. This configurable, powerful, point-and-click learning algorithm leverages AI to optimize task allocation. The solution maximizes the number of tasks assigned to field engineers per day, minimizing travel time, idle time, and overtime, leading to lower service delivery costs and higher productivity.

Routing can be configured to run at regular intervals. During each run, the routing engine performs the following actions:

- Assigns new activities to available engineers who have the required skill sets and are closest to the customer site
- Reassigns pending activities based on real-time updates such as traffic conditions, delays in prior job completion, or deviations in schedule
- Routes activities dynamically in real-time, transferring tasks between engineers based on their skill sets

Over time, the routing engine learns and adapts, thereby boosting resource utilization. It captures real-time data on field engineers and tasks, including time taken for job completion, and feeds it into a learning algorithm. By analyzing patterns from previous routing runs and engineer travel times, the engine constantly refines the routing quality and time estimates[4].

Additional capabilities of the Routing module

Oracle Field Service Cloud provides extensive flexibility to configure routing logic customized to specific requirements. Outlined below are real-world scenarios that explain how a routing engine can be configured to address them:

Scenario 1: A high-priority task, such as a customer escalation or an emergency service, is uploaded to the routing engine. However, all qualified field engineers are already assigned other tasks and have no bandwidth.

Routing configuration:

The routing engine can be configured to evaluate existing assignments of available engineers, reprioritize less critical tasks, and replace them with the higher priority activity. The displaced low-priority tasks can then be reassigned to another suitable engineer at the next available opportunity.

Alternatively, the system can be configured to flag top-priority activities to the dispatching manager, who can manually review and assign them suitably.

Scenario 2: A customer requests an appointment at a specific time with a preferred field engineer.

Routing configuration:

System settings can be configured to lock specific activities on a designated engineer's route, ensuring they are neither reordered on that route nor reassigned to other field engineers.

Similarly, various other scenarios can be configured for effective routing based on business needs:

Checking spare part availability:

Verifies that the assigned engineer has the necessary spares for the job and generates a warehouse pick-up activity for any missing spare parts

Bundling multiple jobs:

Groups and enables several activities scheduled at the same customer site to be executed by the same field engineer in a single visit

Blocking tasks:

Prevents task routing for customers with a credit hold; once the holds are released in the system, the tasks can be automatically routed without manual intervention

Routing can be set to run 24x7, optimizing activities across engineer routes. Each routing run generates a comprehensive routing report that includes the percentage of activities successfully routed and reasons for any non-routed activities.

Incomplete tasks of the day can be automatically rescheduled for the next day. They can also be flagged for manual review by dispatch managers who can determine the next course of action.

Case Study 3

Infosys deployed a comprehensive, automated field service solution for a global leader in secure financial and banking technologies. This implementation addressed several critical considerations integral to their scheduling requirements.

- *Operations spanned multiple geographies and time zones, with activities in some regions exclusively serviced by external contractors and vendors.*
- *After-hours and weekend work was handled differently from regular hours, with smaller teams serving larger geographies during these times.*
- *Customer appointments, escalations, emergencies, or urgent requests were prioritized over normal repair and preventive maintenance tasks.*

Routing Configuration: Best Practices

Based on our extensive experience with field service transformation projects, we recommend the following best practices when configuring Oracle's Routing module:

1. Ensure accurate master data:

The outcome of a routing run is only as good as the data fed into the algorithm. Therefore, it is imperative to clean up the master data—particularly by carefully reviewing customer site addresses for accuracy, as discrepancies can lead to incorrect travel estimations and negatively impact routing efficiency.

2. Review regional address variations:

Address formats can vary significantly across geographies. For example, the US uses five-digit zip codes, while Canada uses six-character format zip codes with a space after the first three characters. Other regions may lack standard zip code formats. The routing configuration should recognize and accommodate these regional variations for enhanced accuracy.

3. Start small:

When routing is applied to a large geographical area all at once, the outcome can be difficult to manage. Start by applying routing to smaller territories, analyze the results, fix data issues, and refine the routing strategy before expanding to bigger regions.

4. Optimize the learning algorithm:

The routing algorithm continuously learns and optimizes over time based on real-time data. Plan for iterative improvements to enable the algorithm to mature and deliver consistent results.

Conclusion

Our field service solution leverages Oracle's capabilities and real-time, data-driven decision making to boost scheduling efficiency. Its scalable, agile framework streamlines service delivery while efficiently handling typical scheduling challenges. Consequently, organizations can shift focus to productive, higher-value improvements, driving customer satisfaction, revenue growth, profitability, and brand differentiation through service excellence.

Field service scheduling in asset-intensive industries present a complex set of challenges beyond accurate scheduling alone. While accurate scheduling is critical, a successful field service implementation involves other interconnected facets that must be optimized and fine-tuned. This involves harnessing data, AI, and generative AI (GenAI) to enable predictive maintenance, streamline service contract and entitlement resolution, improve knowledge management, optimize engineer capacity planning, and design efficient workflows. Each of these areas is complex and deserves individual attention.

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Praveen has over 15 years of digital transformation and consulting experience in the Oracle CRM and CX technology space. He has been involved in several large global implementations of Oracle CPQ Cloud, Subscription Cloud and Field Service Cloud across Manufacturing, Hi-Tech and Utility customers. He loves walking into challenging implementations and keenly follows the latest trends in the CX space. His areas of interest include revenue transformation and improving post sale customer experiences.

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