Minds + Machines
Boosting Field Service Productivity Through Intelligent Scheduling

CHRIS WADA
VP, Product Management
GE Digital

SUSAN TONKIN
Product Marketing Manager
GE Digital

Minds + Machines
What is Field Service Management?

Based On: Six Categories Of Field Service Management Application Functionality By Jim Robinson, Gartner, July 2016

DEMAND MANAGEMENT
• IoT Integration
• Customer Portal
• CRM Integration

WORK PLANNING
• Scheduling Optimization
• Dispatch
• Parts
• Trunk Stock

TECHNICIAN ENABLEMENT
• Scheduling and Routing
• Knowledge Base
• Installed Base Mgmt.
• Entitlements

WORK ORDER DEBRIEF
• Time
• Material
• Expenses
• Work Debrief
• Close-Off

ANALYTICS AND INTEGRATIONS
• Reports
• Dashboards
• Service Performance Metrics

OPERATIONS
• Warranty
• Planned Maintenance
• Contracts
• Invoicing
• Reverse Logistics
• Depot Repair
• RMA
ServiceMax Platform

FIELD SERVICE BUSINESS PLATFORM

WORK PLANNING & SCHEDULING

TECHNICIAN ENABLEMENT

WORK ORDER DEBRIEF

ENTITLEMENTS & LOGISTICS

INSTALLED BASE

CORE TECHNOLOGY

OPTIMIZATION ENGINE

ENTITLEMENTS ENGINE

MOBILE & SYNC ENGINE

SERVICE FLOW PROCESS ENGINE

REPORTING & METRICS ENGINE

INTERNET OF THINGS

ANALYTICS & INTEGRATIONS

Minds + Machines
Scheduling & Dispatch is Key to Improve Productivity

**Business**
- Improve utilization
- Exceed SLA expectations
- Increase customer experience

**Dispatcher**
- 360° customer view
- Accurate schedule
- Contextual information

**Technician**
- Right job with right parts
- Handle more jobs/day
- Greater productivity
- Right information for FTF

Minds + Machines
ServiceMax Offers Robust Scheduling Options

- **Manual Dispatch:** Assign Directly on Work Order
- **Immediate Dispatch:** Auto Assign to a Technician or Queue
- **Interactive Dispatch:** Using the Dispatch Console
- **Self-Dispatch:** Allowing Technicians to Dispatch
- **Optimized Dispatch:** Schedule Optimization

Minds + Machines
Manual Dispatch
Basic Manual Dispatch

- Technicians assigned directly on the Work Order
- ServiceMax populates scheduling information on the Work Order
- Workflow rules can be used to notify technicians
Advanced Interactive Dispatch

- Interactive and highly configurable
- Rich drag-and-drop UI
- Prioritize assignments per customer/order priority
- Filter on work order queues, technician teams and
- Automatic work dispatch to partner technicians
Filter Work Orders on desired fields

Show where business rules are configured e.g. skills etc.
The technicians matching this skill are listed below

The work order and technician locations are plotted on the map
Self Dispatch

- Dispatcher pushes jobs to technician
- Technician searches for work orders & self-dispatches
- Improves technician utilization
- Drives service revenue
Automated Scheduling
Immediate Dispatch

- Rules based assignment of Work Orders based on fields
- Work Orders can be assigned to Technicians, Queues or Dispatchers
Advanced Schedule Optimization

**Variables**
- Work orders
- WO priorities
- SLA / Appointment
- Technicians
- Distances
- Costs

**Constraints**
- Skills
- Expertise
- Overtime
- Holidays
- Availability
- Dependency

```
• SLA compliance
• First Time fix rate
• Utilization rate
• On time Arrivals
• Customer satisfaction
• Travel costs
• Overtime costs
```

Minds + Machines
Configurable to Your Business Outcome

Specify the cost of each optimization parameter. Values allowed are 1 to 100, with 100 denoting the highest weightage.

- Importance of meeting Appointment/SLA time windows: 10
- Importance of minimizing Overall Travel Costs (drive time/miles): 1
- Importance of Balancing Drive Times between technicians: 50
- Importance of minimizing Overtime schedules/cost: 10
- Importance of assigning jobs to Qualified Technicians: 1

Minds + Machines
Schedule Optimization - Batch & Incremental Modes

**Batch**

- Territory specific
- Runs overnight
  - Example - 2000 work orders, 50 technicians / territory

**Incremental**

- Injects same day high priority work
- Can run every 30 mins
- Quick results
Real-time Optimization

Optimizes throughout the workday
- Prioritizes emergency work orders
- Handles change in capacity

Constantly improves schedule
- Until dispatch threshold is reached

Makes dispatcher strategic
- Focus on driving customer experience
- Manage exceptions better

Minds + Machines
Navigating to the Optimal Solution

1. Construction Algorithm
   A starting solution with low costs

2. Simulated Annealing
   A semi-random solution with significantly lower costs

3. Genetic Algorithm
   Highly iterative, constantly improving revisions

Solution Space

Minds + Machines
Example: Before Schedule Optimization

- Longer, inefficient travel route
- Poor worker utilization
Example: After Schedule Optimization

- Shorter travel route
- Better worker utilization
Results

Pilot Results (Europe)
- Extra Job/day
- Drive time reduced > 40%
- ~100% for SLA attainment

Gartner Case Study
- 10K+ more proactive jobs
- 20% reduction in travel
- 10% better utilization

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Quick Recap

Dealing with scheduling complexity is hard

Our rigorous solution will help you achieve your business outcomes

• Be strategic
• Focus on the customer
• Increase revenue
• Control costs

Minds + Machines
Roadmap
Work Planning & Scheduling Strategic Themes

**Work Planning**
- Projects
- Crew Management
- Shift Management

**Dispatch Console**
- Redefined user experience
- Single technician or crew based scheduling
- Project scheduling
- Real time data overlays and interaction

**Fully automated scheduling through Optimization**
# Work Planning & Scheduling Roadmap

**As of July 2017**

<table>
<thead>
<tr>
<th></th>
<th>2017 2H</th>
<th>1H 2018</th>
<th>2H 2018</th>
<th>2019+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work Planning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shift Management</td>
<td>Crew Management</td>
<td>Project Content Integration Support</td>
<td>Project Authoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Project Costing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Capacity Planning</td>
</tr>
<tr>
<td><strong>Dispatch Console</strong></td>
<td>Enhancements on Dispatch Console 1.0</td>
<td>New Dispatch Console 2.0 with Crew Support (Beta)</td>
<td>New Dispatch Console 2.0 with Crew Support (GA)</td>
<td>Project Scheduling (GA)</td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td>Dependencies</td>
<td>Project Scheduling Support (Beta)</td>
<td>GIS Integration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optimization</strong></td>
<td>Appointment booking</td>
<td>Benchmarking</td>
<td>Crew Optimization</td>
<td>Long Cycle Optimization</td>
</tr>
<tr>
<td></td>
<td>Overnight stays</td>
<td>Travel Time Calculation</td>
<td>Shift Optimization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simulation run</td>
<td>Setup improvements</td>
<td>Dispatch Console 2.0 Integration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuous optimization</td>
<td>Improved performance and stability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Work Planning: Crew Management

- Manage crews assignments
  - Daily
  - Date Range
- Required tools, skills and qualifications
- Crew leader assignment

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Work Planning: Projects

- Quickly import tasks, task dependencies and requirements
- Plan and schedule long-cycle work, outages and other complex services using the project management module

Minds + Machines

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Work Planning: Shift Availability

- Ability to define standard shift plans (N-Day)
- Shift hierarchy override model (Holiday, PTO)
- Roster technicians to multiple shifts on different dates

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console : User Experience

Optimized for dispatcher needs
Focus on personalization
Anchored by powerful search
Improved performance

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console: Assisted Dispatch

- Rules Driven Auto Dispatch
- Drive time estimation
- Jeopardy management
- Contextualized Analytics using Machine Learning
- Resource Recommendations on Scheduler and Maps

Minds + Machines

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console: Assisted Dispatch

- Rules Driven Auto Dispatch
- Drive time estimation
- Jeopardy management
- Contextualized Analytics using Machine Learning
- Resource Recommendations on Scheduler and Maps

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console: Real time monitoring

- Real time resource location
- Location of inventory
- Configurable overlays
- Real time notification feed
- Multiple Map Providers

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console: Real time monitoring

- Real time resource location
- Location of inventory
- Configurable overlays
- Real time notification feed
- Multiple Map Providers

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Dispatch Console: Real time monitoring

- Real time resource location
- Location of inventory
- Configurable overlays
- Real time notification feed
- Multiple Map Providers

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Schedule Optimization

Functional Short Cycle Work

- Continuous Real-Time optimization
- Offer cost optimized appointment/booking windows to customers
- Advanced optimization scenarios including overnight stays
- Travel time calculations

Source: Gartner: How to achieve Scheduling Optimization in Field Service, Mar 2017, Jim Robinson
Take The Next Step

To learn more about this topic:

1. Find us at the ServiceMax demo booth
2. Contact Servicemax Product Management
3. Visit Servicemax.com/resources
Thank You

Minds + Machines
Download the M+M App

Search and download: CrowdCompass Attendee Hub

Minds + Machines

Search: Minds + Machines 2017
Event Passcode: mmsf2017
Session Feedback

Find the session you’re attending in the schedule icon of the app.

Check-in and rate sessions clicking on the icon and rate the session by selecting the appropriate star.

Minds + Machines