Delivering Business Value through Target-Driven Optimization

Introduction

What if each of your mobile workers could perform just one more job per day? What if you could achieve double digit savings on your fuel and vehicle costs? What if you could add 10 percent labor cost savings to the bottom line, while at the same time increase customer satisfaction? Or more importantly, what if you could do all three simultaneously?

These types of improvements can be readily achieved by increasing your mobile workforce utilization rate, increasing your scheduling efficiency, or increasing your routing efficiency. This whitepaper addresses how to improve one, two, or all three of these performance metrics using mobile resource optimization software.

A Challenging Business Environment

As the person responsible for mobile resource in your organization, you are frequently being asked to do more with less – either complete the same number of jobs with fewer workers or accommodate more jobs with the same resources. Working against you are high fuel costs, higher labor costs due to rising health care and other benefits costs, legal pressures, and economic conditions out of your control. If your company charges for services, it may be reluctant to increase prices to cover these costs in a difficult economy.

You need a way to make improvements in the use of your mobile resource, both people and equipment, at the lowest possible cost. There are too many variables to consider all of the permutations in your head or in a spreadsheet: crews, contractors, labor costs, labor rules, skills, vehicles, equipment, types of jobs, customer preferences, service level agreement (SLA), service territory, weather, traffic, and so on. That is where mobile resource optimization software comes in.

It can take into account all of the variables listed above, evaluate thousands of combinations, and generate optimized schedules based on your targets and priorities.

Let's focus on three different metrics for improvement: mobile workforce utilization rate, scheduling efficiency, and routing efficiency. Even small improvements to these metrics can result in completing more jobs per day or saving labor and fuel costs.

Increasing Workforce Utilization

The first metric you can choose to improve is your mobile workforce utilization rate, or the amount of time your resources are working on jobs versus driving or waiting. According to the Aberdeen Group, the workforce utilization rate is 78 percent for Best-In-Class companies (64% for All Others), and the average worker completes 2.92 work orders daily[1]. That means workers are not working for 177 minutes out of each 8-hour work day. Fitting in another job during those 177 minutes may mean you could reduce overtime, or reduce the number of contractor hours, or simply get more jobs done in a day, depending on your company's operational objectives.

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1 Aberdeen Group, Field Service 2013: Workforce Management Guide

Mobile resource optimization software can build the most effective schedule to maximize your resource utilization using three separate inputs:

» All of the jobs generated throughout the company, including the location of the job, the skills required, and the estimated duration of the job. These jobs often are sourced from a variety of demand processes: call center agents confirming customers' requests for service, customers scheduling directly via the corporate website, or other applications such as an enterprise asset management (EAM) system that detects issues and generates job orders to address those issues. Regardless of where a job order originates, it should be centrally scheduled based on common business rules, as opposed to being scheduled in silos or assigned to resources that only work on one type of job order.

» All mobile resources: individuals and crews, their skill sets and qualifications, the equipment (vehicles, trucks) they use to get to the field, and the equipment they use to perform the jobs in the field. Ideally you are able to assign jobs across your entire mobile workforce (i.e., a unified resource pool) to maximize the number of jobs your workers can complete in a regular day or week. If you limit mobile resources to work by certain locations, jobs, or department-specific workloads, you are restricting your scheduling efficiency.

» Scheduling business rules. These focus on your targets and priorities, but may also include labor laws or other restrictions. Companies, and even departments within companies, put different priorities on mobile resource and service objectives. For example, Company A has one-hour customer appointment windows and is penalized for being late, so its highest priority is arriving on time, every time. Company B has longer appointment windows but has a corporate imperative to save on driving costs (fuel and vehicle), so its highest priority is optimizing the driving routes.

Based on these three inputs—your jobs, resources, and rules—the scheduler evaluates all of the possible combinations and generates a schedule that meets your targets and priorities. It maximizes the number of jobs that can be fit into the schedule and minimizes the amount of time your resources are idle.

SCHEDULING COMBINATIONS

The number of scheduling permutations can increase rapidly. If you had just two mobile resources (A and B) and three jobs (J1, J2, and J3), there are eight different scheduling options, assuming no other factors:

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
Crew A	J1, J2, J3		J1, J2	J3	J2	J1, J3	J1	J2, J3
Crew B		J1, J2, J3	J3	J1, J2	J1, J3	J2	J2, J3	J1

If you have four resources and twenty jobs, the scheduling combinations are more than a trillion. Imagine 400 mobile resources with 4,000 jobs!

In addition, the software's real-time capability maximizes utilization by continuously re-optimizing the schedule based on real-time events – a job that is finished early, a mobile resource that goes home sick, a road that is closed due to flooding, or an emergency job that must be fit in. The software uses the same business rules to recreate an optimal schedule throughout the day, as things change.

A utilization rate success story

A UK-based claims management service has 150 mobile resources. By implementing mobile resource service optimization software, the company increased the number of calls per day per resource from 3.6 to 5.6, a 55 percent increase. This was achieved by the software considering the relative efficiency of each possible appointment and only offering customers the more efficient options.

Increasing Scheduling Efficiency

The second metric you can choose to improve is scheduling efficiency. You can address three specific areas:

» **Managing jobs with dependencies**. Jobs can be dependent on other jobs or events; examples include getting official permits, having the delivery items assembled, getting underground utilities marked, getting a special part ordered and delivered, confirming the appointment with the customer, and so on. The scheduler may only be able to firmly schedule the first couple of activities, and then tentatively schedule subsequent jobs based on planned completions or lead times. It then must constantly check for completion statuses prior to scheduling subsequent jobs, and alert for jobs hanging indefinitely in limbo. Efficiency is lost if a worker shows up at noon but the replacement part will not arrive until 2 PM.

» **Managing jobs with SLAs**. The management of service level agreements is imperative to field service organizations. Agreements may include financial penalties for being late – either to the end customer or in the form of regulatory fines. With or without the financial incentive, the company's reputation is at risk if they cannot consistently comply with agreements. The scheduler must continually track the job in the schedule against the agreement, raising the priority the closer the time gets to the due date and time. Not having this capability turns agreements in jeopardy into emergencies, which in turn jeopardizes getting them scheduled efficiently. Successfully managing agreements can enable you to differentiate yourselves from the competition; for example, you can offer smaller appointment windows or "on time or it's free" type offers.

» **Managing the mix of resources based on cost**. You may also want to address your mixture of resources and better balance internal and external resources, or the amount of overtime worked. Identifying costs associated with each type of resource and then adding resource cost as a scheduling variable enables the scheduler to give you the least cost option to accomplish your service targets.

A scheduling efficiency success story

Another UK-based company has an online business that fulfills an average of 120,000 orders a week using 3,000 delivery vans. By implementing mobile resource optimization software they were able to improve their on-time delivery rate by 50 percent, and thereby increase customer satisfaction. The company differentiates their service by offering one-hour delivery appointments; if they are late, the customer gets a coupon for their next order.

Increasing Routing Efficiency

The third metric you can choose to improve is your routing efficiency, or the distance traveled to get from one job to the next. The emphasis for this performance metric is to optimize the routes driven by your mobile resources in order to save time, fuel, and vehicle wear and tear. It is measured by the total distance driven and the total travel time per schedule.

The routing component of mobile resource optimization software incorporates map data that provides a representation of the complete road network for the area. Best-in-class software dynamically calculates drive time and distance options as an integral part of the optimization process that determines which jobs are assigned to which resource. Less effective software generally assigns jobs to resources first and then optimizes routes with assumed travel times. As the day progresses and jobs are reprioritized in response to emergencies and other real time events, a route is simultaneously adjusted, but always following the established business rules.

Savings potential

The travel cost for 150 crews driving 25,000 miles (40,000 km) each per year @ 50 cents per mile = $1,875,000.

Increasing routing efficiency by 10 percent (each crew driving 2,500 less miles per year) would result in $187,500 in savings.

Implementing automated routing is typically a challenge for most companies. Drivers believe they know the best way or a special short cut, not realizing that since they traveled a route a week ago, a long term construction project had started, closing half the lanes and backing up traffic during the day. Precious time is then wasted back tracking and finding a different route. Additional performance metrics such a driving deviation from plan or travel times exceeding planned times can be used to address this issue.

A routing efficiency success story

A UK-based company provides fuel control and site management services to more than 4,000 gas stations. The company had previously been able to shorten response time windows to 4 hours. The deployment of field service optimization software permitted the company to decrease travel time by an additional 10 percent, increase service level agreement adherence by 20%, and increase calls per day from 3.5 to 5.

Conclusion

Mobile resource optimization software helps you reduce service costs while also improving customer service and satisfaction. By continuous refinement of the business rules used to schedule resources, mobile resource optimization software improves your workforce utilization rate, your scheduling efficiency, and your routing efficiency--with bottom-line results.

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